# ENVIRONMENTAL REASONING OF SECONDARY-LEVEL SCHOOLCHILDREN: CASE STUDY OF OKAHANDJA, NAMIBIA

by

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# DECLARATION

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# ABSTRACT

Okahandja has been identified as one of the 'dirtiest towns' in Namibia. The town's location makes it an important node serving as a gateway to the leisure and tourism periphery in Namibia. However, environmental problems such as littering and the burning of household waste are threatening the local cultural and nature-based tourism industry and the aesthetic beauty of the town. These forms of pollution pose various health risks to people living in the area, to those who interact with the spaces as well as for grazing animals and the natural environment. The aim of the study was to explore the environmental reasoning of secondary-level schoolchildren of Okahandja and to establish the main determinants of their environmental knowledge, attitudes and behaviour.

The research objectives of the study were (1) to study the literature on and understand the concepts and models related to pro-environmental behaviour (PEB), environmental worldview, environmental concern and place attachment; (2) conduct transect walks through the communities to gain a contextual understanding; (3) question secondary-level schoolchildren at JG van der Wath Secondary School about their environmental knowledge and concern that influence their environmental reasoning; (4) investigate the influences (im)mobility (low access to transport) and place attachment to Okahandja have on the schoolchildren's views and perceptions of the environment; (5) explore how the children view their local environment and how they want their living environment to change; and (6) examine whether children from different ethnic groups reason differently about the environment and whether these distinctions influence their interactions with their surroundings.

The study followed a mixed-methods approach. A questionnaire survey among schoolchildren elicited information supplemented by observations made during transect walks, focus group discussions and participatory drawing exercises. Data was captured and analysed using STATISTICA, Excel and ArcGIS. The findings indicate that the children are aware of and relatively well-informed about the significance of a clean and protected environment. They were also well able to identify the importance of Okahandja within the Namibian landscape. Participants, especially female participants are concerned about protecting the natural environment. Greater emphasis was placed on environmental problems that are apparent and aesthetically unpleasing such as littering, than on other environmental issues such as the chopping down of trees and the burning of household waste. Participants only have a moderate sense of attachment to Okahandja so causing them to have a weak sense of responsibility and desire to behave pro-environmentally. Although community cohesion and social ties are strong

within the communities, mistrust and miscommunication between residents and local authorities were identified as major stumbling blocks to PEB. Dissatisfaction with structural opportunities was displayed through a lack of concern and cooperation, leading to high levels of environmental degradation in and around Okahandja. The children seem to possess a 'balanced' environmental worldview as they believe that the natural environment should be protected yet used to sustain human life. The importance of positive role models such as parents and teachers was highlighted. It is recommended that environmental education (EE) and awareness should be implemented on three levels, namely parental, school and community.

**Keywords and phrases:** Environmental behaviour, pro-environmental behaviour, environmental knowledge, environmental concern, place attachment, environmental education, environmental reasoning, Okahandja

# OPSOMMING

Okahandja staan bekend as een van die 'vuilste dorpe' in Namibië. Die ligging van die dorp maak dit 'n belangrike nodus wat dien as 'n poort na die ontspannings- en toerisme-periferie in Namibië.  Maar omgewingskwessies soos rommelstrooiing en die verbranding van huishoudelike afval bedreig die plaaslike toerismebedryf en estetiese skoonheid van die dorp wat gegrondves is op sy kultuur en die natuur. Hierdie vorme van besoedeling hou gesondheidsrisiko's in vir bewoners in die gebied, vir diegene wat beweeg in die ruimte, vir diere wat wei en die natuurlike omgewing. Die doel van die studie was om sekondêre skoolleerlinge van Okahandja se redenering oor die omgewing te ondersoek en die bepalende faktore van hul kennis van die omgewing en hul houding en gedrag teenoor die omgewing vas te stel.

Die navorsingsdoelwitte van die studie was (1) om die literatuur oor pro-omgewingsgedrag (POG), die wêreldbeskouing oor die omgewing, besorgdheid oor die omgewing en verbondenheid aan 'n plek te bestudeer en die konsepte en modelle verwant daaraan te verstaan; (2) om deur die gemeenskappe te stap (of te deurkruis) om 'n kontekstuele begrip te verkry; (3) om sekondêre skoolleerlinge van JG van der Wath Sekondêre Skool te ondervra oor hul kennis en besorgtheid vir die omgewing en vas te stel hoe dit hul redenering oor die omgewing beïnvloed; (4) om die invloed wat (im)mobiliteit (beperkte toegang tot vervoer) en plekgehegtheid aan Okahandja het op die skoolleerlinge se omgewingsienings en –persepsies te ondersoek; (5) te ontdek hoe die kinders hul plaaslike omgewing sien en hoe hulle wil hê die omgewing waarin hul leef, moet verander; en (6) om vas te stel of kinders van verskillende etniese groepe verskillend redeneer oor die omgewing en of hierdie onderskeid hul interaksie met hul omgewing beïnvloed.

Die studie maak van verskillende metodes gebruik. 'n Vraelys-opname het sekere inligting aan die lig gebring, dit is aangevul deur waarnemings tydens staptogte wat die studiegebied deurkruis het, fokusgroepbesprekings en deelnemende tekenoefeninge. Inligting is opgeteken en geanaliseer deur middel van STATISTICA, Excel en ArcGIS. Die bevindings toon dat die kinders bewus en relatief goed ingelig is oor die belangrikheid van 'n skoon en beskermde omgewing. Hulle was goed in staat om die belangrikheid van Okahandja binne die Namibiese landskap te identifiseer. Deelnemers, veral vroulike deelnemers, is besorg oor die beskerming van die natuurlike omgewing. Respondente het groter klem geplaas op omgewingsprobleme wat duidelik en esteties onaangenaam is soos rommelstrooiing, eerder as ander omgewingskwessies soos die afkap van bome en die verbranding van huishoudelike afval. Deelnemers het slegs 'n redelike sin van gehegtheid aan Okahandja wat veroorsaak dat hulle 'n swak sin van

verantwoordelikheid en begeerte om pro-omgewing op te tree, het. Alhoewel gemeenskapsamehorigheid en sosiale bande sterk is binne die gemeenskappe, is wantroue en gebrekkige kommunikasie tussen inwoners en plaaslike owerhede geïdentifiseer as die hoofstruikelblokke van POG. Ontevredenheid met strukturele geleenthede is geopenbaar deur 'n gebrek aan besorgdheid en samewerking wat lei tot hoë vlakke van omgewingsdegradasie in en rondom Okahandja. Dit lyk of die kinders 'n 'gebalanseerde' wêreldbeskouing van die omgewing het, want hulle glo dat die natuurlike omgewing beskerm moet word, maar tog gebruik moet word om menselewens te onderhou. Die belangrikheid van positiewe rolmodelle soos ouers en onderwysers het uitgestaan. Daar word aanbeveel dat omgewingsopvoeding en –bewustheid op drie vlakke, naamlik ouer-, skool- en gemeenskapsvlak geïmplementeer moet word.

**Sleutelwoorde en -frases:** Omgewingsgedrag, pro-omgewingsgedrag, omgewingskennis, omgewingsbesorgdheid, plekverbondenheid, omgewingsopvoeding, omgewingsredenering, Okahandja

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- And, most importantly, all the glory, honour and power belong to Jesus! For in Him we live and move and have our being (Acts 17:28).

The things we leave behind, the trail of bread crumbs of our existence, create a pattern that tells a tale. Whether it be pawprints or carbon footprints, we sign our names in nature and in history as we live out our days. Left behind is a legacy that may or may not simply be a beautiful pattern in the landscape. Paul Nicklen (*National Geographic* photographer)

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# ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| CBD | central business district |
| DSP | dominant social paradigm |
| EBF('s) | environmental behaviour factor(s) |
| EE | environmental education |
| GIS | geographic information systems |
| ha | hectares |
| HEP | human exceptionalism paradigm |
| km | kilometres |
| LSD | least significant difference |
| MoE | Ministry of Education |
| NADEET | Namib Desert Environmental Education Trust |
| NEEN | Namibian Environmental Education Network |
| NEP | new environmental paradigm |
| NGO | non-governmental organisation |
| NSA | Namibia Statistics Agency |
| PEB | pro-environmental behaviour |
| SWAPO | South West Africa People's Organization |
| T & T | travel & tourism |
| UNCED | The United Nations Conference on Environment and Development |
| UNESCO | The United Nations Educational, Scientific and Cultural Organization |
| UPM | United People's Movement |
| VBN | value-belief-norm |

# CHAPTER 1 INTRODUCTION: LAYING THE FOUNDATION

## 1.1 INTRODUCTION

Geography is often defined as the academic discipline "concerned with the study of the phenomena of Earth's natural environment, its human life and actions and the nature and outcomes of interrelationships within and between these phenomena in functional and spatial contexts over time" (Fairhurst et al. 2003: 7). These complex human–environment interactions are important to establish a basis for responsible environmental planning, strategic management and protection (IGU 2009; Worboys, Lockwood & De Lacy 2001). Over the years, the relationship between humans and the environment (natural and built) has led to much research across the globe.

Earth Day was birthed in 1970 to create a consciousness of the troubled state of the environment and how human behaviour threatens the future of all living species. The energy crisis and environmentally-threatening behaviours caused research interest to peak in the mid-1970s (Dwyer et al. 1993). A review of the behavioural-intention literature by Geller, Winett & Everett (1982) indicates that research interest declined in the 1980s due to lack of support, difficulties with working with large systems and the obstinacy of deeply-rooted cultural practices (Dwyer et al. 1993). The 1990s were labelled the "decade of the environment" (Menon et al. 1999: 1) and "ripe for environmental protection research" (Geller 1990: 273) as scientists became more aware of the devastating effects on the environment (ozone depletion and climate change) of consumer behaviour and economic activities (Cleveland, Kalamas & Laroche 2005). Today's developed world has been characterised by high level of environmental concern and support for resource conservation and nature protection (Fransson & Garling 1999; Hodgkinson & Innes 2000; Imran, Alam & Beaumont 2014; Schahn & Holzer 1990; Schultz 2000; Schultz & Zelezny 1998).

This is evident in widely-publicised issues such as worldwide environmental degradation in recent years. Increased exposure to newsworthy stories about the world's ecosystems ensured that people have become more conscious of 'the environment'. Political agreements between countries such as the United States of America (USA) and China to reduce carbon emissions and to increase electricity production through the use of non-fossil fuels often reach the news headlines (Hoye 2014). Moreover, high-profile events and conferences such as the United Nations Framework Convention on Climate Change in Rio de Janeiro more than 20 years ago, the legally-binding emission-reduction targets set by the Kyoto Protocol more than 15 years ago and the World Earth Summit of Johannesburg (2002) all aimed to widely disseminate the

message of sustainability to all spheres of government (Lynn 2014). Awareness of climate change has also been raised through documentaries such as *An Inconvenient Truth* and the children's film *Ice Age: The Meltdown*. The high scores on environmental-concern indices reflect growing awareness of the environment and the seriousness of environmental problems (Milbrath 1989). While policymakers have reached consensus that action should be taken to prevent further environmental damage, the different roles and stances of nations (richer and poorer countries) concerning environmental issues have engendered conflicts (Cleveland, Kalamas & Laroche 2005).

Despite elevated environmental concern, shocking and unexpected environmental (and socio-economic) disasters are frequent occurrences. Even rare occurrences such as the 35 000 walruses coming ashore on a beach in north-west Alaska in October 2014 due to a lack of sea ice for resting (Joling 2014) are reminders of environmental problems. On social media, *National Geographic* photographer and researcher Paul Nicklen commented that "The walruses are telling us what the polar bears have told us and what many indigenous people have told us in the high Arctic, and that is that the Arctic environment is changing extremely rapidly and it is time for the rest of the world to take notice and also to take action to address the root causes of climate change." Lehman & Geller (2005) have air pollution, climate change, water pollution and depletion, accumulation of solid waste, soil erosion and contamination as some of the most serious environmental threats. Ecosystem change, destruction and malfunction are becoming increasingly evident, making it increasingly difficult for the environment to support human life (Reddy 2011). Yet, human beings continue to engage in unfriendly environmental behaviours at various levels (individual, governmental, corporate and societal) (Makki, Abd-El-Khalick & BouJaoude 2003). This is largely attributable to today's population levels as many of our current practices are unsustainable as they place increasing pressure on the availability of limited resources for future generations. Environmental problems are regarded as a by-product of human desires as organisations and technologies aim to provide physical comfort, enjoyment, mobility, power and status (Stern 2000). Stern, Young & Druckman (1991: 3) have argued that "beliefs, attitudes and values related to material possessions and the relation of humanity and nature are often seen as lying at the root of environmental degradation." Environmental problems are often considered more serious in rural, developing settings where people are dependent on natural resources for an income and to meet their daily needs (Hunter, Strife & Twine 2010; Koziell & Saunders 2001; Shackleton & Shackleton 2004). This includes land-based activities such as livestock farming and the trade and consumption of fuelwood. The environment therefore serves as 'buffer' against household shocks such as unemployment (Hunter, Strife & Twine 2010). The

predicament is whether we use nature as we wish so as to meet our needs or whether we value and nurture nature for its intrinsic value? Hardin (1968) long ago argued that the human race faces the dilemma of protecting natural resources and preventing overuse while individuals aspire to optimise their gains.

However, research by sociologists, geographers and psychologists has shown that it is difficult to encourage people to adhere to the principles of pro-environmental behaviour (PEB). To understand the relationship between humans and their environments these scholars have explored the roots of environmental behaviour. The pressing need for alternative environmental practices and a shift in environmental reasoning has also forced governments, policymakers and educators to explore the importance of factors such as environmental knowledge, environmental awareness, environmental attitudes, personal responsibility, socio-economic status and locus of control (Hines, Hungerford & Tomera 1986/87; Kollmuss & Agyeman 2002; Pe'er, Goldman & Yavetz 2007). However, due to the complexity of PEB, researchers have shifted their attention from which factors influence PEB to how and to what extent various factors influence PEB. While various factors have been investigated in many contexts, there is no consensus among researchers as to which factors best predict PEB.

This thesis explores the environmental reasoning[1], attitudes, views, values, knowledge and behaviour of secondary-level schoolchildren living in central Namibia. This introductory chapter begins by discussing the importance of investigating the environmental reasoning of young people as future decision makers. The chapter continues by providing background about the study area, then formulates the research problem, the aim and objectives, sets out the approach taken and describes the research methodology. The chapter concludes with a chapter-by-chapter breakdown of the thesis structure. Chapter 1 serves as the foundation of the study as it provides the fundamentals of the thesis, offers an understanding of the relationship between adolescents and their environments and highlights the significance of the research for geography. The next section explores the youth as important subjects in studies of environmental behaviour.

## 1.2 YOUTH AND THE ENVIRONMENT

The human brain reaches full size by the age of six so that there is little growth of the brain during adolescence although it does undergo extensive modification and alteration of its networks and wiring (Dobbs 2011). Several vital developmental processes and changes occur during this period, for example puberty plays a role in restructuring body systems and influences

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[1] Reasoning is the cerebral process of forming conclusions, judgements, or inferences from facts or premises (Collins English Dictionary 2015).

social information processing; the prefrontal cortex, which regulates cognition and behaviour is refined; enhanced interregional communication occurs between other brain regions and the prefrontal cortex; and substantial synaptic pruning and non-trivial physiological reversibility of behavioural and neuroendocrine patterns manifest (Boyce & Keating 2004; Keating & Hertzman 1999; Meaney 2001; Steinberg 2005). Even simple structural measures, such as white-to-gray matter ratios demonstrate large-scale changes into the late teenage years (Chapman et al. 2004; Chen et al. 2010; Korkeila et al. 2010).

Early adolescence is associated with improved reasoning, information processing and expertise (Steinberg 2005). According to Steinberg (2005: 70) "There has been broad consensus for more than 25 years that, as a result of these gains, individuals become more capable of abstract, multidimensional, planned and hypothetical thinking as they develop from late childhood into middle adolescence." Therefore, adolescence is a turning point between childhood and adulthood (Crain 1985) when teenagers develop the capacity to reason, work things out and take account of the bigger picture (Berk 1994; Vosniadou in Paraskeva-Hadjichambi et al. 2012). They are able to solve problems, talk about possibilities and concepts and cope with environmental protection tasks (Evans et al. 2007; Paraskeva-Hadjichambi et al. 2012). This cohort is particularly appealing for study because during the transition from youth to adulthood adolescents develop an understanding and awareness of issues pertaining to wider society (Altemeyer 1996). Another vital part of adolescence is the discovery and establishment of personality and social identity as there is often hesitancy about their behaviour in a social context (Louw & Louw 2007). Ages 10 to 12 are considered the developmental period when values, attitudes, and emotional motives begin to be formed (Wray-Lake et al. 2010). Behavioural studies have shown that adolescents are poor decision makers (consider participation in dangerous activities, susceptibility to automobile accidents, drug use and unprotected sex) with poor cognitive skills relating to information about the consequences of risky behaviour (Botvin 1991; Tobler 1986). Transformations in the adolescent brain enable us to understand the cognitive advances and behaviour during this period as well as the need for adult guidance and oversight (Berk 2012).

In their study of the link between an ecological view of children and environmental education (EE) Van Staden & Loubser (1995) make use of Berk's (1994) model (Figure 1.1) of interdependent ecological systems that influence the development of a child. The model suggests that children are influenced by four social systems, namely the microsystem, the mesosystem, the exosystem and the macrosystem (Van Staden & Loubser 1995). The microsystem is the most basic social system that includes all face-to-face interpersonal relationships a child might have with different settings and individuals. In the mesosystem, a third party influences the interaction

between two individuals who can potentially support or degrade the quality of the relationship (e.g. relationship between peer experiences and home experiences). The exosystem refers to social settings and events affecting children such as parents' levels of stress and financial assistance. The macrosystem encompasses interaction between the other three social systems. In societies there are subcultures of people, causing people from certain places to have certain broad-based beliefs and customs (Van Staden & Loubser 1995). They also have similar perceptions of lifestyle, expectations, resources available to them and patterns of social exchange. Their perceptions can be influenced by aspects such as neighbourhood or geographic location and levels of income. These nested systems that form a child's ecological environment are important because they demonstrate the complex nature of potential influences on the development, thinking, reasoning and behaviour of a child.
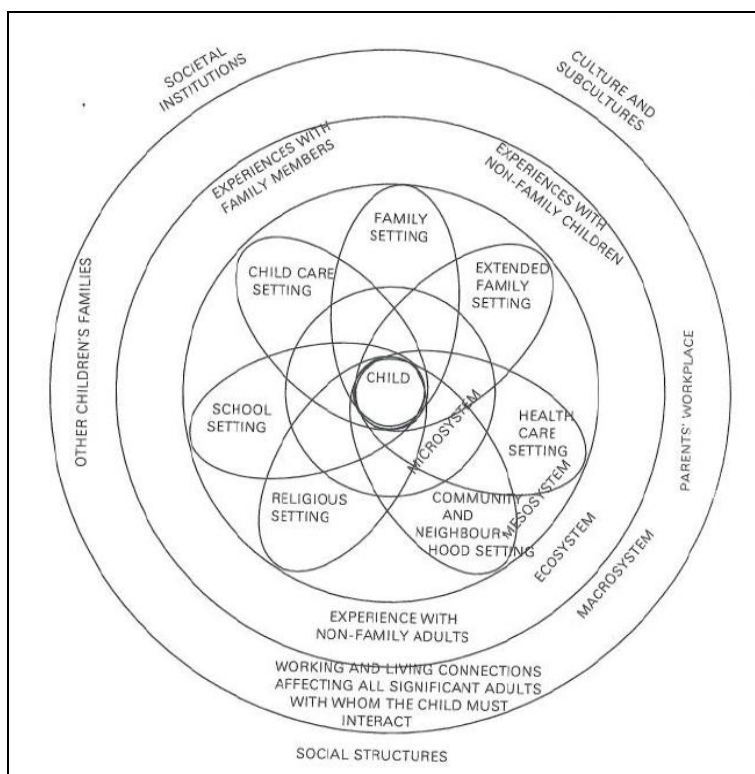


Source: Van Staden & Loubser (1995: 114)

Figure 1.1 Ecological systems that influence the development of a child

Today's youths are important because they are regarded as the decision makers of the future who will directly and indirectly affect future decisions pertaining to resource use and sustainment (Meinhold & Malkus 2005). Today's adolescent populations will be held accountable for the future sustainability of the environment throughout the world. Lee (2011) highlights that adolescents play a significant role in environmentalism because of their higher levels of environmental consciousness, longer lifespan and the influence they can have on peer networks and relatives.

Despite the fact that children are often the main recipients of EE programmes and information, their relationship with their personal environment and how they engage in their own environments are largely undocumented (Loughland et al. 2003; Payne 1998; Wals 1994). Literature on environmental psychology and human geography has shown that children experience, perceive and value their environments in fundamentally different ways to adults (Burke 2005; Heft 1988; Loebach 2013; Matthews & Limb 1999; Rasmussen 2004). Cheng & Monroe (2012) and Wells & Lekies (2006) found that when children gain experience in nature or participate with 'domesticated' nature such as planting seeds and harvesting fruits, their connection with nature increases. Moreover, nature near homes plays an important role as children can easily access and play in nature so causing them to develop an emotional affinity with nature (Cheng & Monroe 2012). This helps them to develop positive values and attitudes about nature (Davis, Rea & Waite 2006). The emotional tie with nature is a powerful predictor of nature-protective willingness and behaviour that will support nature (Kals, Schumacher & Montada 1999). Also, the more positive adolescents feel about PEB, the higher their levels of self-esteem, self-efficacy and internal locus of control (Meinhold & Malkus 2005).

Today's children have great access to EE and environmental information but they are also exposed to misinformation, confusing messages and potential indoctrination. Nagel (2005) has warned that an ambiguous understanding of the environment can develop a sense of 'learned hopelessness' and notions of apathy. Sobel (in Berryman 1999) cites 'ecophobia' to explain the notion that "when presented with overwhelming global problems at too young an age, children gain knowledge of environmental issues but are scared of the world" (p. 62). Therefore, by exploring the environmental reasoning of young people during this turbulent stage of development and self-discovery can shed light on how they think and on the forces that influence their way of thinking. This study focuses on the environmental reasoning of secondary-level schoolchildren. By investigating behavioural factors one can identify the types of individuals who are most likely to contribute to environmental protection. Such studies help to recognise the constraints of PEB during this critical life stage. In the next section the larger research context is discussed.

## 1.3 RESEARCH CONTEXT: THE LARGER PERSPECTIVE

Namibia is situated in south-western Africa. It is bordered by the Atlantic Ocean, South Africa, Botswana, Zambia, Zimbabwe and Angola. Namibia is divided into 14 administrative and political regions (Figure 1.2), namely the Zambezi (previously called Caprivi), Erongo, Hardap, !Karas, Kavango (Kavango East and Kavango West), Khomas, Kunene, Ohangwena,

Omaheke, Omusati, Oshana, Oshikoto and Otjozondjupa. Namibia's geographical area is 824 000 km$^2$ and it has a population density of only 2.6 people per km$^2$ (Government of the Republic of Namibia 2013).
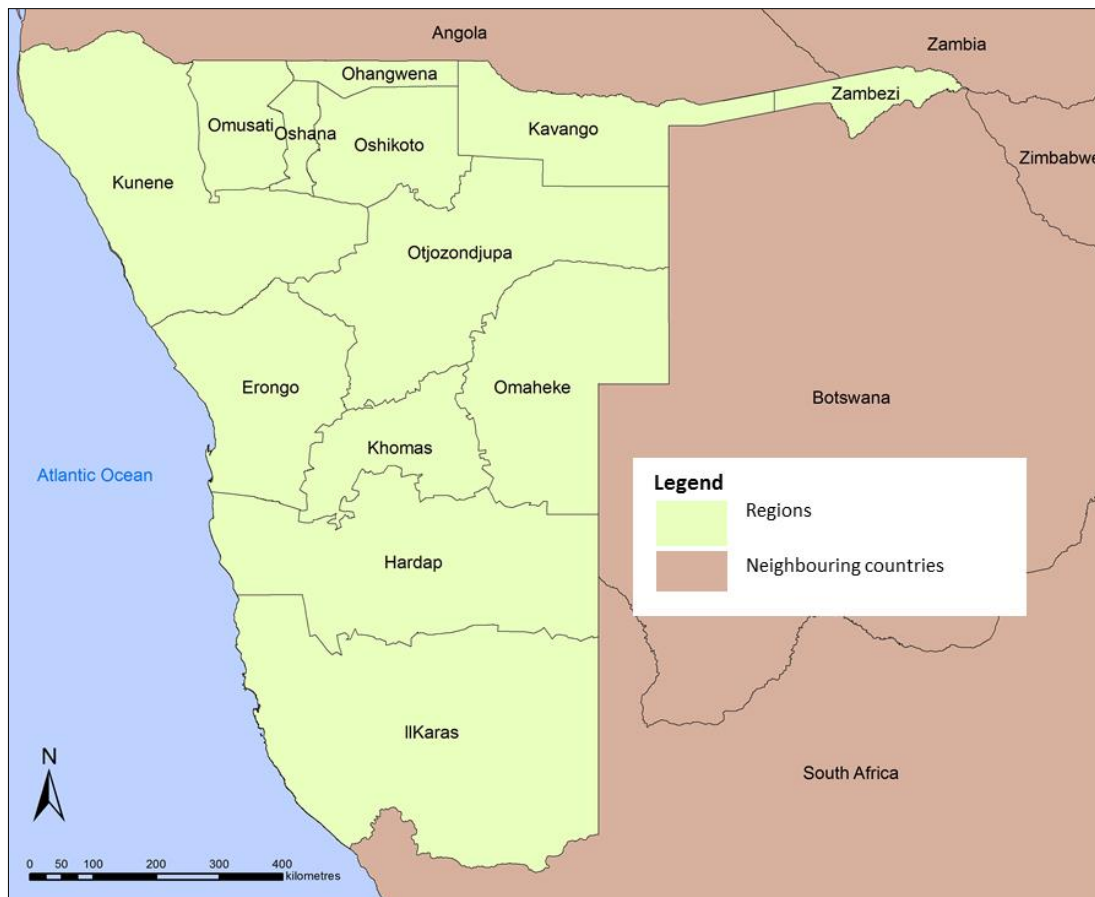


Figure 1.2 The regions of Namibia

According to the latest (2011) census the country has a population of 2.1 million. Namibia is an arid country with no perennial rivers except along its borders (Enviroteach 1995). Rainfall is highly variable posing formidable challenges to subsistence farmers. Namibia is greatly reliant on its natural-resource base which includes diamonds, gold, zinc, uranium, copper, fisheries, wildlife and the cultural and nature-based tourist industry (Government of the Republic of Namibia 2013). According to the 2015 Travel & Tourism (T & T) index published by the World Economic Forum, Namibia ranked one of the top five most T & T competitive economies in sub-Saharan Africa and takes 70th position in a world ranking of 141 countries (WEF 2015). The rankings are based on indices that include enabling environment (safety and security, health and hygiene); T & T policy and enabling conditions (price competiveness and environmental sustainability); infrastructure; and natural and cultural resources. In 2013 Namibia received the Gift to the Earth Award from the World Wildlife Fund and, notably the Namib Sand Sea Desert was added to the UNESCO's World Heritage list (Graham 2014). In 2014 Namibia was named

as one of the top tourist destinations in the world by travel-guide publishers *Lonely Planet* on the grounds of the country's remarkable progress in sustainable development and because it is the first African country to include environmental protection in its constitution (Lonely Planet 2015). According to *Africa's Finest* (2015), five of Namibia's lodges, camps and facilities rate among the top 50 most ecofriendly in sub-Saharan Africa. The lodges were evaluated according to four categories of criteria, namely successful conservation work; effective community outreach programmes; the use of renewable energy and waste treatment and disposal. The importance of the tourism is also highlighted in the Fifth National Report to the Convention on Biological Diversity by the Ministry of Environment and Tourism (MET) (2014: 1):

> The tourism industry, for which national parks and pristine nature are considered the bedrock, is recognized as the fastest growing sector of the Namibian economy. Travel and tourism was estimated to have accounted for 20.5 per cent of GDP in 2011 (directly and indirectly) (WTTC 2012), and it is a key industry in Namibia linking economic development with poverty alleviation and biodiversity conservation.

Regrettably, environmental degradation[2] has been identified as a problem in Namibia since independence in March 1990. Prior to independence many people lacked the necessary knowledge and skills to make sustainable choices (Kanyimba 2009). This led to environmental mismanagement and environmental problems now acutely visible. Moyo, O'Keefe & Sill (1993) and MET (2014) have catalogued Namibia's main environmental problems as land degradation in communal areas; deforestation; surface-water shortages; severely depleted fish stocks; pollution through the use of firewood and by the mining sector; overgrazing; bush encroachment; and human-wildlife conflicts.

Simultaneous with the country's environmental degradation is rapid industrial development and urbanisation with concomitant changing lifestyles and increasing population and, like most African countries, Namibia is also confronted with profound socio-economic issues that threaten the natural and cultural attractions of the country. These issues include high HIV/AIDS rates, food insecurity, violence against children and women, weakening capacities for governance, poor service delivery of social services, insufficient access to improved sanitation and drinking water, and below-standard health and hygiene (Blanke & Chiesa 2013). The country is also in dire need of improved education and training to develop its human resources base (Blanke & Chiesa 2013). The Namibia Statistics Agency's (NSA) announcement of an estimated population growth of 63% between 2011 and 2041 calls attention to the pressures and challenges municipalities will face to deliver services timeously and efficiently (Kaira 2014). This is

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[2] Environmental degradation refers to the deterioration of the environment through the depletion of resources such as air, water and soil and the destruction of ecosystems.

worsened by widespread apathy and a lack of cooperation among inhabitants which lead to further environmental degradation.

It is abundantly clear that the uniqueness of the Namibian landscape should be protected and preserved as it is a prime contributor to the socio-economic wellbeing of the country. It is similarly clear that any environmental degradation is a serious threat to the country's natural resource base and attractiveness and should be managed, curbed and eliminated. Environmental protection should therefore be a priority for all Namibian citizens and tourists visiting the country.

## 1.4 ENVIRONMENTAL EDUCATION IN NAMIBIA

Namibia has responded to the global outcry for environmental protection and sustainable development by incorporating EE into school curricula and other sectors of the country. These endeavours and achievements are discussed in this section below. The roots of these are fixed in Article 95 of the Namibian Constitution that states that:

> The State shall actively promote and maintain the welfare of the people by adopting, inter alia, policies aimed at the maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future; in particular, the Government shall provide measures against the dumping or recycling of foreign nuclear and toxic waste on Namibian territory (Namibia 1998: 45).

Moreover, frequent reference is made to the commitment by the Namibian government to ensure the sustainable development of the country. Environmental sustainability is one of Namibia's Millennium Development Goals (Government of the Republic of Namibia 2013). According to the Namibian Environmental Education Network (NEEN 2004: 1), Namibia's EE policy states that:

> We the people of Namibia, will actively encourage, support and implement environmental education as a means of achieving, and fulfilling Article 95 of the Constitution. Environmental education should aim to empower Namibians, from all sectors, to critically evaluate environmental information and options, to make informed decisions and to take action that will contribute to the goal of environmental and economic sustainability (p.1).

Monroe (1994) cites Namibia's Green Plan (drafted at the 1992 United Nations Conference on Environment and Development in Rio de Janeiro) to illustrate the government's commitment to EE. The first goal is to ensure "encouraging environmental awareness and education initiatives" (p. 7) and second "Namibia's goal is to develop an environmentally literate society in which citizens have the knowledge, skills, and values necessary for appropriate action" (p. 164) and it acknowledges the importance of the involvement of Namibians in environmental decision

making. To fulfil the goals outlined in Namibia's EE policy, the government will ensure access to EE by formal and non-formal means (Monroe 1994). The policy document proposes the implementation of seven basic approaches (Table 1.1) to achieve the aims of EE in Namibia.

Table 1.1 Basic approaches for the implementation of environmental education in Namibia

| Approach | Strategy |
|---|---|
| **Networking** | EE in Namibia should develop through networking between various affected and interested parties such as the government, NGOs and the private sector. Emphasis is placed on sharing and exchanging ideas and skills. |
| **Sensitisation, lobbying and advocacy** | Sensitise Namibians to environmental issues through electronic and printed media, the education system and entertainment. |
| **Training and capacity building** | Develop the human resource base through continuous training and capacity building. |
| **Curriculum Development** | Include all stakeholders in a participatory process of curriculum development and improvement. Pre-school through university curricula should be constantly reviewed and evaluated. |
| **Programme development** | All new projects and programmes developed within EE should take cognisance of the broad aims of this policy document and attempt to contribute to reaching them. |
| **Development of learning-support materials** | Ongoing production, testing and evaluation of resource material used in EE must be pursued. |
| **Research, monitoring and evaluation** | Research must determine the opportunities and future directions of EE while monitoring and evaluation must ensure continuous improvement. |

Source: Adapted from NEEN (2004)

An example of the successful implementation of these approaches is the Namib Desert Environmental Education Trust (NaDEET). The NaDEET centre[3] aims to engage participants in sustainable living practices though hands-on experiential learning in a desert environment (Bittenbender 2009). Another example is the EnviroTeach Project which focuses its activities on resource production and teacher assistance (Imene 2010).

The document *Towards education for all* (Ministry of Basic Education and Culture 1993) makes no direct reference to EE but it carries a message of a harmonious relationship between the people of Namibia and the physical wellbeing of the environment (Kanyimba 2009). In its *Pilot curriculum guide for formal basic education* the Ministry of Basic Education, Sport and Culture (1996) placed greater emphasis on the role of schools in implementing environmental awareness. One of the aims, 'Development of environmental and population awareness' (Subsection 3.10) has the following objectives:

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[3] The NaDEET centre is located 100 km south of Sossusvlei on the NamibRand Nature Reserve.

- Develop an *understanding* of the dynamic interdependence of living and non-living things and the environment.

- Develop a *sense of responsibility* for restoring and maintaining ecological balances through the sustainable management of natural resources.

- Promote the learner's *involvement* in practical activities to preserve and sustain the natural environment.

- Lay a foundation for informed and responsible *attitudes and choices* towards the balance of population growth, ecological sustainability, and the quality of life for all Namibians.

In Namibia, environmental learning is one of five themes placed as a topic or sub-topic in carrier subjects across the grade levels. The recommended subjects and carrier subjects of EE are listed in Table 1.2.

Table 1.2 Carrier subjects of environmental education in Namibian school curricula

| School phase | Subjects used to teach environmental education |
|---|---|
| Lower Primary: Grades 1-4 | Social Studies, Environmental Studies, Natural Science and Health Education |
| Upper Primary: Grades 5-7 | Social studies, Natural Science and Health Education, Religious and Moral Education, Home Ecology, Elementary Agriculture |
| Junior Secondary: Grades 8-10 | Geography, Home Economics, Business Studies, Development Studies, Life Science, Physical Science, History |
| Senior secondary: Grades 11-12 | Geography, Natural Economy, Biology |

Source: Kanyimba (2009: 76)

The recommendation is evident that various subjects across the grade levels incorporate EE into their frameworks and coursework. The use of various subjects as carrier subjects confirms that an integrated approach to EE has been followed. Knapp (2000) has recommended that EE should be promoted to a subject with its own standing. However, EE as cross-curricular theme appears to be a better route because isolating EE may lead to compartmentalised learning experiences so hindering learners from noting the relevance of EE and its interrelatedness with other subjects. Cross-curricular teaching will create awareness of the importance of environmental protection in all spheres of life. The Ministry of Basic Education and Culture (1998: 8) has noted that cross-curricular themes "can strengthen the learner's knowledge and awareness of issues, and the complexity and interrelatedness of the problems surrounding them." Gambro & Switzky (1996: 30) argue that "the interdisciplinary nature of environmental problems provides an ideal opportunity for meaningful, integrated, and problem-oriented instruction."

EE as a cross-curricular theme has been identified as a strategy to instil environmental knowledge and awareness in the hearts of Namibian children. However, despite the ambitious commitments of environment-related school subjects to promote continuing EE and to increase environmental awareness among young people in Namibia, environmental problems keep occurring. A possible explanation for the disconnect between the implemented curriculum and PEB is given by Makki, Abd-El-Khalick & BouJaoude (2003: 31) as "a curriculum may provide teachers and students with lots of information, but present information in ways that do not foster creativity, interest, and student involvement, resulting in lack of motivation and little meaningful learning." Stevenson (2007) holds the view that school learning tends to be atomistic and individual while EE advocates learning that is holistic and co-operative. The introduction of EE into schools therefore challenges the dominant organisation and transmission of knowledge, which conflicts with traditional approaches to teaching and learning (Esland in Stevenson 2007). This is discussed further in Chapter 2. In the next section the study area is introduced in such a manner to set the scene for the research that will follow.

## 1.5 THE RESEARCH SETTING: OKAHANDJA, NAMIBIA

Section 1.5 provides an in-depth explanation of Okahandja as research context. First, the location of Okahandja and its historical significance are outlined. Second, a profile of the population of Okahandja is given. Third, the biophysical environment is discussed. Fourth, the importance of Okahandja as tourism gateway is explained and last, the residential areas within the study area are discussed.

### 1.5.1    Study area location and its historical significance

Okahandja is situated at the intersection of the B1 main road, which runs in a north-south direction through the central part of Namibia (connecting Noordoewer (South African border) with Oshikango (Namibian border)), and the B2 road, which runs in a west-east direction from Walvis Bay. Both roads carry large volumes of traffic past Okahandja to tourist destinations such as the Etosha National Park, Waterberg Plateau Park, Erindi Game Reserve and Swakopmund. Many local residents also travel through Okahandja to visit relatives living in rural areas or on communal lands. Okahandja is an important node serving as a gateway to the northern and coastal areas of Namibia. Okahandja is the gateway to the leisure and tourism periphery of Namibia.

Windhoek, the capital city of Namibia, lies 70 km south of Okahandja (Figure 1.3). Numerous people travel from northern and western Namibia to Windhoek for specialised medical treatment and/or shopping. This causes high traffic flows through Okahandja which is a popular rest stop

for fuel and refreshments. The nearest towns to the north and the west are Otjiwarongo (180 km) and Karibib (115 km) respectively. While tourist books and bureaus mention Okahandja, the town is not a recognised destination, rather just a stopping point (Santcross, Baker & Ballard 2001; Swaney 2002). Okahandja is, however, a convenient and popular town for people who are unable to pay the high house rentals charged in Windhoek and people looking for a quieter and smaller town to live in. It has been estimated that approximately 600 people commute daily between Okahandja and Windhoek (Smit 2012). Construction of a four-lane freeway (B1) between Windhoek and Okahandja will quite likely lead to an increase in the number of commuters on completion.



Source: Nations Online Project (2015)

Figure 1.3 Location of Okahandja in Namibia

The name Okahandja derives from the local Otjiherero dialect and means "the place where two rivers (Okakango and Okamita) flow into each other to form one wide one." Okahandja is known as the "Garden Town of Namibia", an identity that is reflected in the mission statement of the Okahandja Municipality, namely "to transform the town of Okahandja into a prosperous, safe, beautiful garden town that is an industrial hub to Namibia and a tourist magnet of Southern Africa" (Okahandja Municipality 2014).

For many, especially the Herero tribe, Okahandja has great sentimental and historic value as many traditional leaders lived and were buried in Okahandja. Every year, on the Sunday closest to the 23rd of August (the day Chief Samuel Maharero died) thousands of Hereros dressed in traditional clothes gather in Okahandja on Red Flag Day to parade and show respect to leaders and chiefs who fought and died during the struggle against German rule (Figure 1.4). Recently, large crowds attended the burial ceremony of Namibian politician and the paramount chief of the Herero people, Kuaima Riruako, during June 2014. The sentimental and historical value of Okahandja is significant in this study because it can potentially influence the meaning people attach to the town.



Source: Tömmel (2009)

Figure 1.4 Parade on Red Flag Day

### 1.5.2   Population

According to the 2011 population census of the NSA, the population of Okahandja was 22 639 of whom 11 562 (51%) were female and 11 077 (49%) male (NSA 2014). The population pyramid of Okahandja shows the typical profile of a developing country. The population composition has a wide base of children and dominated further by the youth and economically active cohorts, a tapering of cohorts with age but capped by the elderly (65 and older) (Figure 1.5). The latter cohort will quite likely increase in the future as more people see Okahandja as an

ideal place for retirement. From the population pyramid it is clear that young people comprise a significant part of the total population. For this reason, the environmental reasoning of secondary-level schoolchildren as contributors to environmental change was investigated. The majority of the working population (nearly 70%) is dependent on wages and salaries as their source of income. Many are employed by the Namibian Government (Defence Force, Education and Police Force). Other sources of income are business activities (12.2%), farming (1.4%), pensions and social grants (17%).
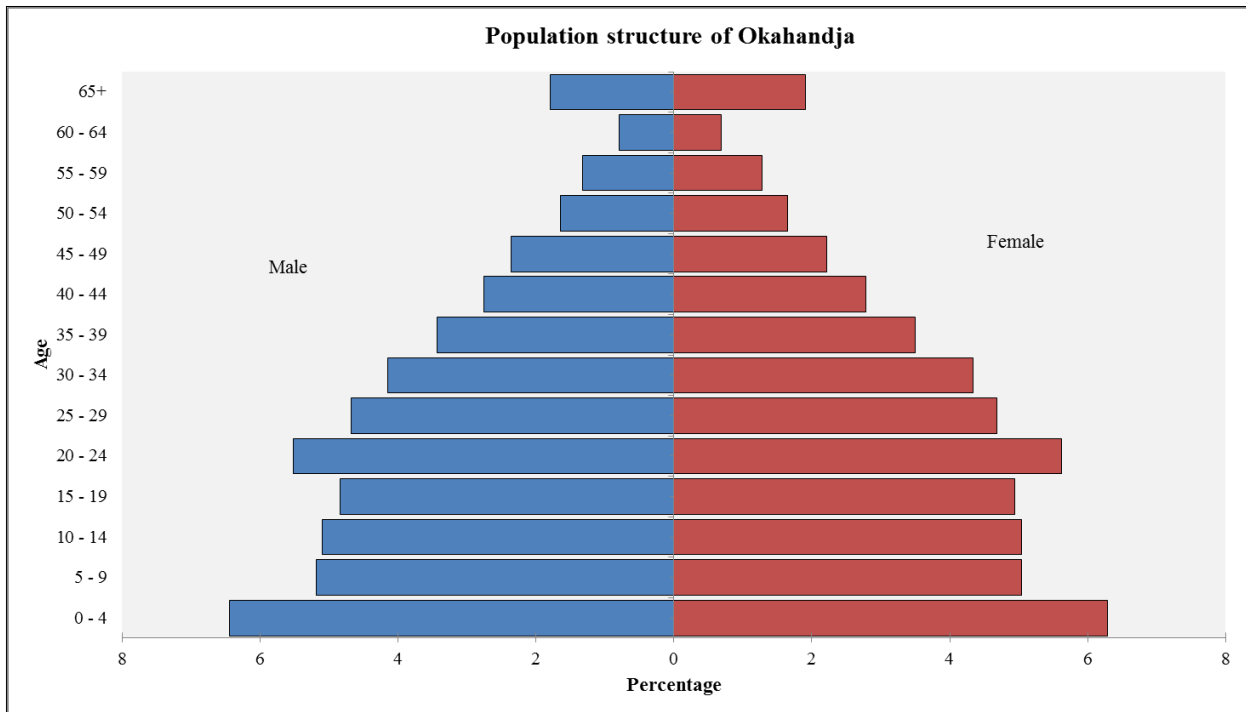


Source: Constructed from NSA (2014) data.

Figure 1.5 Population pyramid of Okahandja

### 1.5.3    Biophysical environment

The vegetation of the area is savannah, dominated by acacia species like *Acacia erioloba* (camel thorn), *Acacia mellifera* (blackthorn), *Acacia tortilis* (umbrella-thorn) and other species like *Boscia albitrunca* (shepherd's tree) and *Dichostrachys cinerea* (sickle-bush). Shrubs include *Aloe littoralis* (mountain aloe), *Phaeoptilum spinosum* (brittle-bush) and other Grewia species (Strohbach 2001). The veld is mainly sweetveld, which produces high-quality grazing. Common game found in the area includes *Tragelaphus strepsiceros* (kudu), *Oryx gazella* (gemsbok) and *Equus zebra* (zebra).

Geologically, Okahandja is situated on the boundary between the Southern Central Damara (Khomas) Zone and the Okahandja Lineament Zone. While the Okahandja Lineament Zone is known for high-temperature and low-pressure schists, interfingering marble bands and calc-silicate layers along its northern edge, the Central Zone consists of high-temperature, low-

pressure amphibolite in the Okahandja-Otjiwarongo region to lower granulite at the coast (Miller 2008). Plutonic rocks of the Damara Orogen encompass a wide compositional range from diorites to granites and syenites. West of Okahandja (Waldau Dome), several highly metamorphosed and deformed sedimentary, volcanic and intrusive rocks and inliers are exposed (Miller 2008). In the Waldau Dome various gneissic rocks, coarse-grained highly recrystallised quartzites with calc-silicate bands and medium-grained impure marble are found (Blaine 1977). Rock formations in the area also include dolerite sills and dykes and a downfolded to the south. The area's topography is characterised by plains and rocky hills (Figure 1.6). The biophysical environment is relevant in this study because it largely contributes to the livelihoods of Okahandja residents, the aesthetical appeal of the town and tourism significance of surrounding areas.



Source: Author (2014)

Figure 1.6 Topography of the study area

### 1.5.4    Okahandja as industrial hub and tourism gateway

Although Okahandja is a relatively small town, it features a number of businesses including banks, clothing stores, supermarkets, hardware stores and vehicle-repair facilities. The new shopping mall that opened during April 2014 close to the Okahandja highway is a significant addition. A few small industries like Brothers (mattress manufacturing), Okahandja Plastic Converters (plastic tanks) and Beefcor (wholesale meat) lie on the outskirts of the town. Larger industries in and around Okahandja include Closwa Biltong, SABMiller's Namibian Brewery, Jumbo Charcoal, Meatco and Namib Poultry.

The larger farming community relies on cattle farming and hunting as their principle sources of income. The numerous hunting farms (*Jagdfarmen*) surrounding the town draw large numbers of international hunters (Okahandja Online 2015). Okahandja also contributes signally to the

cultural and artistic dimensions of Namibia with its two woodcarver markets totalling 153 stalls at the northern and southern entrances of the town (Anesta, Caceda & Michalka 2004). These stalls are renowned for displaying and selling curios such as woodcarved animals, handcrafted wooden bowls, ivory-art pieces, handmade jewellery and souvenir minerals. Okahandja is also known for the Von Bach Dam Resort (completed in 1973) located 9 km south of the town. The dam is a popular venue for recreational and competitive angling and birdwatching. The Erindi Private Game Reserve lies about 100 km north-west of Okahandja. This 70 000 ha nature reserve, the biggest private game reserve in Southern Africa, is a premier tourist attraction and popular destination for nature lovers (Erindi Private Game Reserve 2015). The Gross Barmen Hot Springs, a favourite place to which local residents break away over weekends and on public holidays, lies 27 km south-west of Okahandja. Other attractions include Okahandja Rock Lodge known for hosting of leadership camps and Okahandja Country Hotel which is an ideal venue for weddings and other events. Various accommodation facilities are available in the town. The Okahandja Municipality organises the annual Tourism and Trade Expo of which the 7th was held in 2015. The exposition aims to provide opportunities for local, regional and national businesses to display their products (Figure 1.7) to attract investment to the town and to boost the local economy by drawing visitors to the event. Figure 1.7a shows a young woman from Ovamboland[4] selling traditional food sources such as mopani worms and makalani fruit, and Figure 1.7b features entrepreneurs selling colourful traditional Ovambo dresses, unique to the Ovambo tribe. The industrial and tourism identity of Okahandja is important because it shows the relevance of the town in Namibia. It also highlights the prominence of protecting and preserving the environment so that the town can be sustained socio-economically.
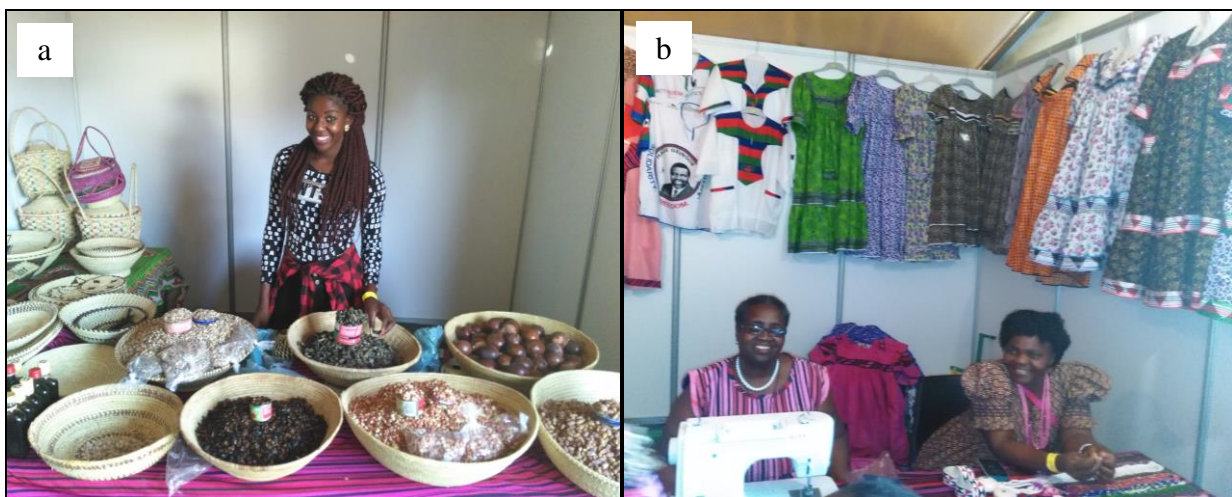


Source: Author (2015)

Figure 1.7 Examples of products sold at the Tourism and Trade Expo 2015

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[4] Ovamboland is the name given to land occupied by the Ovambo people in northern Namibia and southern Angola.

### 1.5.5   Characteristics of residential areas

As in Windhoek's central, Katutura, Khomasdal residential areas, urban growth in Okahandja is mainly occurring in the low-income and informal housing areas (Figure 1.8) (Central Bureau of Statistics 2010). The unaffordability and scarcity of housing in Windhoek have increased housing demand in the formal parts of Okahandja (Central Okahandja) as more people choose to reside in Okahandja. To some extent, housing in Okahandja has remained segregated as in the past, with the town divided into three zones with housing allocated for Whites, Blacks and Coloureds. The central area of Okahandja was reserved for Whites, Nau-Aib (which means "on the other side") for Blacks and Veddersdal for Coloureds (Central Bureau of Statistics 2010).



Source: Central Bureau of Statistics (2010: 17)

Figure 1.8 Urban growth of Okahandja: Nau-Aib and Oshetu, 2001 to 2011

The characteristics of the residential areas relevant to the study are worth discussing in more detail. The descriptions and explanations are based on the researcher's observations during transect walks through the residential areas of the various communities of the town. Residential zoning in Okahandja is complex and people often refer to residential areas more broadly (and the name given by residents) rather than the different municipal extensions. For example, according to the municipal zoning, Central Okahandja (CBD or the area previously reserved for Whites) consists of Okahandja Proper, Okahandja Extension 2, Okahandja Extension 3, Okahandja

Extension 4 and Okahandja Extension 11 but in this research referral is made to Central Okahandja as residential area rather than to its extensions to avoid confusion. The residential areas are described next and their location in Okahandja is shown in Figure 1.9.
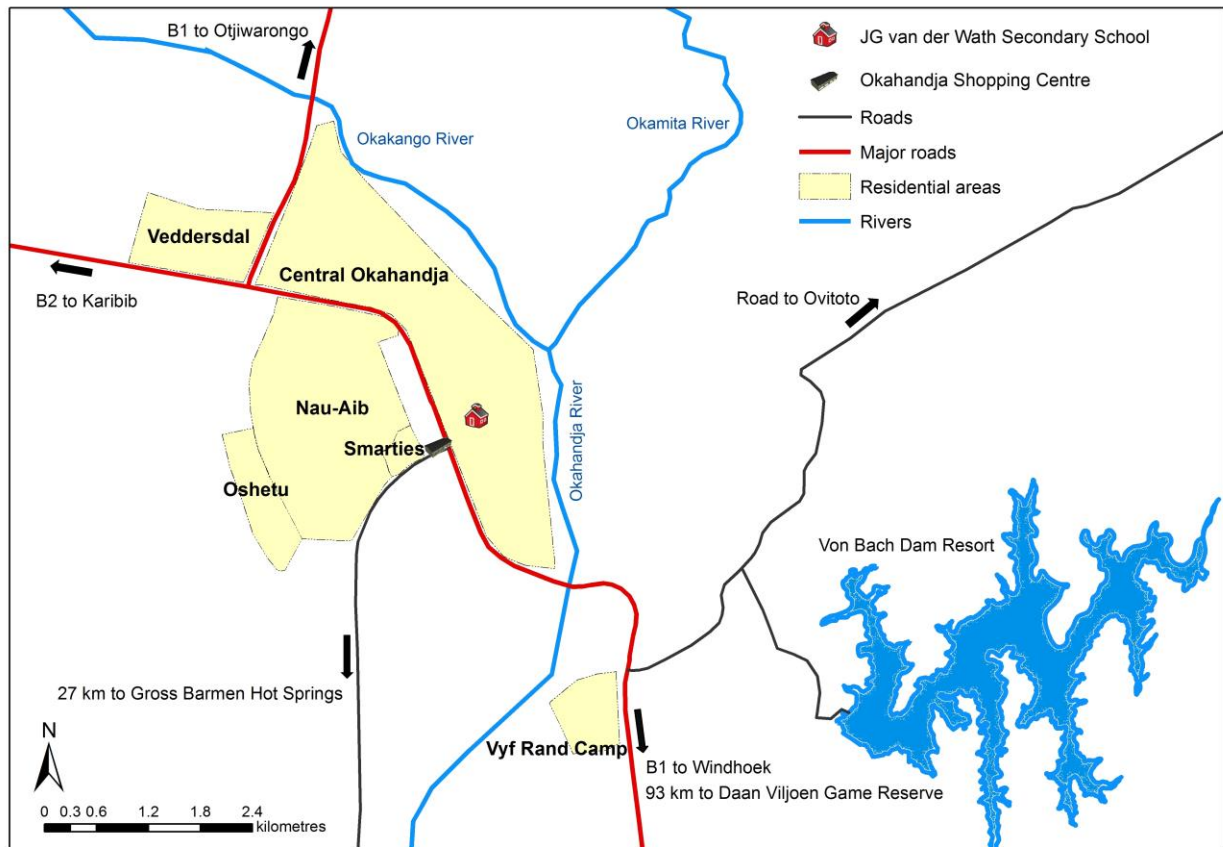


Figure 1.9 Location of residential areas in Okahandja

There are three informal residential areas surrounding Okahandja, namely Vyf Rand Camp, Nau-Aib and Oshetu. The three formal residential areas are Smarties, Veddersdal and Central Okahandja. In 1958 the construction workers who squatted around Von Bach Dam were forcefully moved to three areas. On the western side of Okahandja which the community members called Nau-Aib and Ovitoto, an area 30 km south of Okahandja. Others were relocated to the area now known as Vyf Rand Camp (Five Rand Camp) because the owner of the original farm charged the settlers five South African rand for renting his land (Okahandja Municipality 2009). Oshetu (also known as Dom Lokasie) borders Nau-Aib and being closest to the dumping site high unemployment rates and poverty prevail. The Whites and more affluent Blacks and Coloureds live in Central Okahandja where better quality housing, services and schools are found. Large percentages of people in Okahandja are unemployed, the largest recorded in Oshetu and Vyf Rand Camp. Those who do manage to obtain employment are domestic workers or in major industries such as Meatco, Closwa Biltong and Jumbo Charcoal. Some residents generate an income from their own small shops selling sweets and groceries or firewood which they

collect from surrounding areas (Figure 1.10). Others sell dried fish (caught in the Von Bach Dam) and pods along the B1 to Windhoek. Some women braid and plait hair to earn an income. In Nau-Aib there are many car-washes, some of which are well-known among locals as shebeens that mainly operate in evenings and over weekends. Vyf Rand Camp also has many shebeens and bars. The local children explained that these enterprises are the only source of income for some community members and that they are frequented by 'outsiders' from Windhoek during weekends.



Source: Author (2014)

Figure 1.10 Bundles of firewood sold for an income in Vyf Rand Camp

Okahandja has eight schools serving the local community. JG van der Wath Secondary School and Okahandja Secondary School are the only ones offering schooling up to Grade 12. The lack of secondary schools in some of the informal settlements forces learners to walk long distances to places of education. The majority of learners in Vyf Rand Camp who attend secondary school walk between 5 and 6 km to and from school. The pressing need for more schools is evident in Vyf Rand Camp Primary School and Eden Primary School that both operate on a half-day schooling system where some learners attend school in the morning and the rest in the afternoon. Many of these classrooms are overcrowded and there are shortages of education material. Many parents of children in all of the schools cannot afford to pay for the stationery their children need (primary education is free). JG van der Wath Secondary School which is in the central part of Okahandja, is commonly referred to as 'the best school in the town'. The school had 658 learners from Grades 8 to 12 in 2014. The current (2015) school fees are N$700 (R700) per year which many parents are unable to pay.

Air pollution and environmental pollution are conspicuous in Okahandja. The air pollution is predominantly due to the use of firewood as fuel for cooking and heating and the uncontrolled burning of household and garden waste. In Vyf Rand Camp, Oshetu and Nau-Aib most people use firewood they collect in the areas around the residential areas. Domestic-waste pollution is evident in the residential areas, as is Oshetu (Figure 1.11a), Vyf Rand Camp and Nau-Aib, and to a lesser degree in Veddersdal and Central Okahandja. Smarties (Figure 1.11b) is the 'cleanest' with little or no air and environmental pollution. There appears to be a lack of environmental-health and waste-management services responsible for promoting public health and carring out the monitoring and curbing of pollution.



Sources: Namibian Sun (2015); Author (2014)

Figure 1.11 Residential areas in Okahandja: (a) Oshetu and (b) Smarties illustrating contrasting environmental conditions and housing

A variety of housing types was observed in the residential areas. In Nau-Aib there is a combination of more formal built and informal housing structures. Most of the houses in the older part are made of bricks whereas those in the new developments are either made of brick or corrugated iron. In Vyf Rand Camp houses are brick-built and/or made with corrugated iron and plastic, whereas in Oshetu most houses are built with corrugated iron and plastic. The houses are very small and in many cases they accommodate a whole family in one room. Cooking facilities are usually outside. Some have improvised toilet facilities next to the house. In Vyf Rand Camp and Oshetu many of the houses are built so close to one another that destruction by fire is a great risk. Many houses are built on the riverbanks where they are exposed to flood risk. Increased population numbers and densities cause many people to live overcrowded conditions. Furthermore, not all the roads in Okahandja are tarred. Nau-Aib has a combination of tarred and gravel roads depending on the location and frequency of use. However, in the more-developed

and formal areas, such as Central Okahandja, most roads are tarred, whereas in Vyf Rand Camp, Oshetu and Smarties there are only poorly maintained gravel roads.

The only water supplies for residents in Vyf Rand Camp and Oshetu are municipal communal water taps situated centrally in the residential areas so causing inconvenience to the residents who have to transport heavy water containers over long distances (Figure 1.12). The taps work with pre-paid cards bought from the municipality. In Veddersdal, Nau-Aib, Smarties and Central Okahandja residents have water available in their homes. Children informed the researcher that inhabitants who do not have access to water at home and cannot afford water, make use of any available waterbodies for bathing and washing laundry. Electricity is available in all the settlements, however in Oshetu and Vyf Rand only a few houses have formal electricity connections. Some residents 'buy' electricity via illegal connections from those who have legal electrical connections. This practice is evident in the cables lying in the streets, often dangerously damaged and unprotected. Street lights have been installed in most parts of Okahandja, while Vyf Rand Camp has floodlights in the centre of the residential area to illuminate the area and help ensure security.



Source: Author (2014)

Figure 1.12 Children fetching water from a communal tap in Oshetu

Ineffective and insufficient removal of refuse is evident in the residential areas from litter lying dispersed in all the areas. Large volumes of household waste and garden waste are merely dumped illegally or burnt close to houses (Figure 1.13a). In Five Rand Camp and Oshetu waste dumps surround the settlements forming waste peripheries. Open land, public land and rivers are used as dumping areas, whereas individual plots and private property are conspicuously clean and unpolluted (Figures 1.13c and d). Children play and animals feed in the dumping grounds (Figures 1.13a and b). Even though the municipality collects waste at least once a week,

uncollected refuse remains a problem. Confusion exists about the specific days and times of refuse removal because the municipal service is not always delivered regularly or punctually. In Vyf Rand Camp skip containers are placed for residents to dispose refuse for weekly collection, but they are apparently insufficient given the masses of waste surrounding the containers.

Most of Central Okahandja has storm-water drainage but the informal residential areas (Vyf Rand Camp and Oshetu) have no such infrastructure. This causes storm water to run down the gravel roads so increasing erosion and creating stenches. Poor sanitation facilities result in the collection of filthy, stagnant water in which bacteria can breed so posing various health risks. Whereas all the houses in Central Okahandja, Smarties, Veddersdal and some in Nau-Aib have flush toilets, the residents of Oshetu and Vyf Rand Camp are obliged to make use of unsatisfactory alternative sewage facilities. The local children commented that residents make use of the 'bush' along the river because no toilets are available. The lack of sewerage systems forces people to live in unhygienic and unhealthy circumstances.



Source: Author (2014)

Figure 1.13 Environmental conditions in Okahandja: (a) burning of household waste; (b) chickens feeding on dumping grounds; (c) and (d) clean and unpolluted private property

From the previous discussion it is clear that the communities are faced with various environmental and socio-economic problems. People in some of the residential areas are highly reliant on the natural environment to sustain their daily lives. Informal residential areas such as Vyf Rand Camp and Oshetu experience a lack of running water and proper sanitation, suffer from unemployment and live in informal houses predominately made of corrugated iron. Excessive amounts of dispersed litter, air pollution from the burning of household and garden waste and polluted stagnant water are the main environmental problems.

Environmental and socio-economic conditions and problems in and around Okahandja call for empirical research to better understand them and help to resolve the salient issues. In the next three sections the research problem is formulated, the aim and objectives are stated and the research methods are explained respectively.

## 1.6 PROBLEM STATEMENT

According to the *Republikein* of 14 August 2013, Okahandja, as well as Rehoboth, have been identified as the 'dirtiest towns' in Namibia (Sasman 2013). Since then, the town of Okahandja has been receiving much media attention as visitors and residents voice their concerns in the local press and on social media platforms. Letters published in newspapers carry headings such as "Okahandja is anything but Garden Town" (*The Namibian* 2014) and "Garden Town in the dumps" (Kambowe 2015). When the secretary general of the SWAPO Party Youth League, Dr. Elijah Ngurare, visited Okahandja in 2014 he questioned the poor state of the town and encouraged the municipality to involve the unemployed youth in refuse removal tender processes (Beukes 2014). Similarly, President Hifikepunye Pohamba expressed his disappointment with the dirtiness of Okahandja when he visited the town for the official opening of the refurbished Gross Barmen Resort in December 2014 (Tjihenuna & Haidula 2014). A *Republikein* reader described the condition (Figure 1.14) along the D9172 road from Okahandja to Gross Barmen as "horribly dirty" and that it "leaves no good impression with tourists" (*Republikein* 2013). During the transect walks environmental problems were observed such as the dumping of building rubble in rivers, unauthorised sand mining in riverbeds and the burning of household waste. These pose health and safety risks to people living in the area, those interacting with the spaces and grazing animals and the environment generally. The blame is often placed on the municipality which fails to deliver proper services. Andries Bezuidenhoudt, a member of the United People's Movement (UPM) and of the municipality's management committee, has defended the municipality by pointing out that the waste management problems cannot always be laid at the door of municipality alone because many residents have irresponsible attitudes that

result in them not adhering to waste pickup times and flouting regulations (Sasman 2013). It is apparent that some Okahandja residents regularly engage in unlawful waste-disposal activities because they want to get rid of waste from their personal spaces and do not want to make it their responsibility.



Source: Republikein (2013: 7)

Figure 1.14 Litter dispersed on the way to Gross Barmen

There is little understanding of the reasons for Okahandja's environmental problems and why residents, particularly the youth, have certain attitudes to the environment and behave as they do. Based on observations, aesthetics of the local environments and media releases the residents and municipal officials of Okahandja do not seem to be proud of their surroundings despite the location and natural properties of the town. It is evident that many residents are careless of their responsibilities to protect the environment and have low levels of pride, interest and commitment. There is evident need for more active public involvement from Okahandja's residents to assist in raising the environmental prestige of the area. By investigating the environmental reasoning of secondary-level schoolchildren, insights can be gained on the influence other residents have on the environmental values and environmental attitudes of children. Similarly, the role of parents and peers in the construction of PEB and pro-environmental attitudes will be better understood. It will also help policy makers and educators to understand what triggers undesirable environmental behaviour by the town's youth.

This research addresses the following questions:

1. How do secondary-level schoolchildren interact with their environment?
2. Why do they interact with their environment the way they do?
3. When do they adopt and apply individual responsibility towards the environment?
4. Does their place attachment influence their environmental reasoning and environmental behaviour?

5. How and to what extent does mobility[5] influence their environmental reasoning?

6. How do secondary-level schoolchildren want their future environment to look?

These six research questions will be addressed through the realisation of the research aim and objectives discussed in the next section.

## 1.7 AIM AND OBJECTIVES

The aim is to explore the environmental reasoning of secondary-level schoolchildren of Okahandja so as to establish the main determinants of their environmental knowledge, attitudes and behaviour.

This aim will be realised through the achievement of the following six research objectives:

1. Review the appropriate literature to strengthen the researcher's understanding of the body of knowledge (concepts, theories, models and case studies) relating to pro-environmental behaviour, environmental awareness and environmental education.

2. Become familiar with and gain insights into the local environmental contexts (ecological and social) through observational (transect) walks in the study area.

3. Question secondary-level schoolchildren at JG van der Wath Secondary School about the factors that influence their environmental reasoning.

4. Investigate the influences (im)mobility (low access to transport) and place attachment to Okahandja have on the schoolchildren's views and perceptions of the environment.

5. Explore how the children view their local environment and how they want their living environment to change by means of a drawing project involving the 'current state' and the 'dream Okahandja – a possible future state'.

6. Use focus groups to examine whether children from different ethnic population groups reason differently about the environment and whether these distinctions influence their interactions with their surroundings.

In Section 1.8 the methodology and specific methods applied will be briefly discussed. Also, the ethical considerations of the research are outlined.

## 1.8 METHODOLOGY AND METHODS

This study followed a case-study approach using both qualitative and quantitative approaches to collect primary data. A mixed-methods approach was applied. First, a questionnaire survey was

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[5] Mobility here refers to the farthest distance travelled outside an individual's residential area.

administered to obtain information on participants so providing the research with quantitative and qualitative dimensions. The questionnaires covered participants' socio-demographic and economic backgrounds, their attitudes about and knowledge of the environment, and their self-reported pro-environmental behaviour. Second, transect walks through the residential areas were undertaken to gain a contextual understanding of the communities and the spaces in which they interact daily. Third, a participatory art project was adopted to access the images in the minds of children about Okahandja. Last, focus groups comprising the dominant ethnic populations in the secondary school were assembled to participate in discussions about the relationship between ethnicity and environmental reasoning and to get feedback on some of the themes that arose from the questionnaire survey. The quantitative dimension of the questionnaire was statistically analysed in STATISTICA while the other results were analysed in Excel. All maps were created in ArcMap 10.0. The methodological framework in which the research was done and the methods used for data collection and analysis are discussed in detail in Chapter 3.

Ethical clearance was obtained from the ethical committee of Stellenbosch University which found that the study does not infringe any sensitive or personal matters. The most significant issue was the age of the participants, most being minors. All the participants signed informed consent forms and all participated voluntarily in the research after being assured that participation was optional. Participants also understood that they could withdraw at any stage. They were also advised that there were no right or wrong answers. The information gathered was kept confidential, anonymous and remained in safe keeping. Photographs of participants were only taken if they gave permission. Permission to conduct the research among schoolchildren was obtained from the principal of JG van der Wath Secondary School, the Ministry of Education's Regional Office and teachers at the secondary school.

In the following section a brief history of the origins and the nature of different components of geography are recorded to provide an understanding of where and how the discipline contributes to research on environmental behaviour and environmental education.

## 1.9 THE ROLE OF GEOGRAPHY IN ENVIRONMENTAL BEHAVIOURAL RESEARCH

Following Immanuel Kant's and Bernard Varenius's guidelines for geography's organisation, the leading German geographer Ferdinand von Richthofen classified geography into three more stable subdivisions, namely (1) the study of physical features on the earth's surface such as soils, vegetation and natural hazards which became physical geography; (2) the study of human

features on the earth's surface such as cultures, religion and human-built structures which became human geography; and (3) the occurrence of specific features in a particular area called regional geography (Barnard 2001). Until the 1950s physical geography was the leading subdiscipline while human geography was a slow starter that easily merged and overlapped with other subdisciplines (Barnard 1999). This led to the interpretation called environmental determinism with the main argument being that geography is the only academic discipline that bridged the gap between human and natural sciences (Barnard 2001). One of the discipline's revolutions during the 1960s was behavioural geography which advocated a concern about human behaviour and decision making along with themes such as environmental cognition (Jakle, Brunn & Roseman 1976). Now, physical and human geography are often intertwined and follow a transdisciplinary approach by being grounded in various spheres of social and natural sciences. Castree, Demeritt & Liverman (2009) have pointed out that environmental geography lies in the fertile borderlands where the traditional geography subdisciplines (human geography and physical geography) come together and connect. This is illustrated in Figure 1.15.
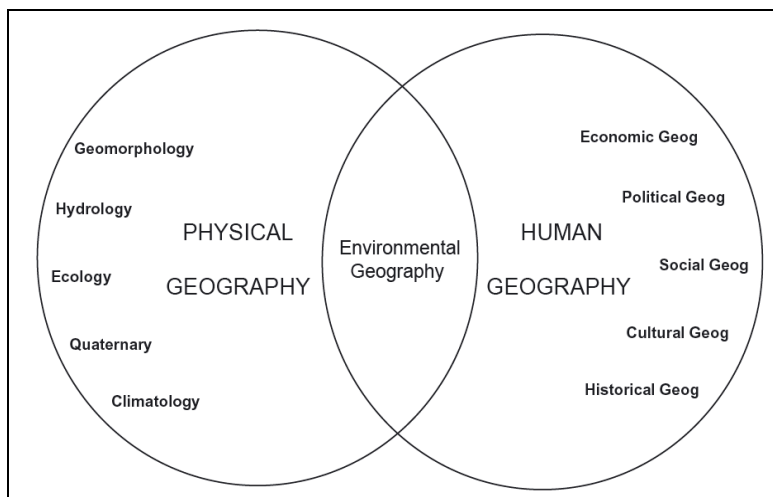


Source: Castree, Demeritt & Liverman (2009: 2)

Figure 1.15 Environmental geography as 'middle-ground' discipline

Despite the fact that environmental issues such as biodiversity loss, climate change and ozone depletion are usually situated in the sphere of natural sciences, the origin of these problems are anthropogenic, therefore most social scientists agree that the 'human' variables should be included in any solutions to environmental problems (Oskamp 2000; Stern 1992; Stern, Young & Druckman 1991). Stern, Young & Druckman (1991) affirm that population growth, economic growth, technological change, political-economic institutions and beliefs and attitudes are driving forces to global environmental change. They contend that because these driving forces act in combination, understanding the linkages presents formidable challenges that require interdisciplinary approaches. Stern (1993) has argued that resolutions of environmental problems

lie in a science of human–environmental interactions as it will provide an understanding of the causative activities and effective ways to change them.

Geography provides the opportunity to take a multiperspective stance and integrate the relationship between the environment (built and natural) and humans into a single understanding so making a valuable contribution to research on environmental behaviour. Baerwald (2010) has characterised geography as a scholarly discipline that is diverse and adaptive, holds multiple perspectives and is ever changing. Geography is differentiated from other disciplines by its spatial and temporal components which look at different arrangements at different scales and asks questions on how the interactions between humans and the natural environment shape the characteristics of the world we live in (*National Geographic* 2015). Moreover, geographers are considered to have the ability to apply their knowledge in integrative and interdisciplinary ways (Solem, Kollasch & Lee 2013). Geographers look beyond the demarcated boundaries of geography and explore topics that seem to lie in the domains of other fields (Baerwald 2010). Geographers achieve this, as McKeown-Ice (1994) points out, by studying the environment in four ways. First, geographers use a wide range of methods for the collection of primary and secondary data through surveys, visual images, observations and modelling as well as various analytical methods to make sense of their surroundings (Clifford, French & Valentine 2010). Second, geographers investigate how human behaviours affect the environment. Third, geographers examine how the environment influences human behaviours, and fourth, geographers study how people perceive their surroundings and how they express their perceptions in landscapes.

Geographers have examined environmental actions in different contexts centered in culturally-informed approaches to deconstruct assumptions about environmental cognition (Barr 2004). Geographers (e.g. Blake 1999; Burgess, Harrison & Filius 1998; Gibbs, Longhurst & Braithwaite 1998; Hobson 2002) have examined public attitudes towards sustainability and the structural and socio-political processes involved in sustainability. Young people's environmental cognitions, environmental perceptions and spatial orientations have also been the topics of geographic investigation (Golledge et al. 1992; Matthews 1984; 1992; Valentine & McKendrick 1997; Yamashita 2002).

Sahin, Demrialp & Karabag (2007) have conceptualised geographical consciousness in a model (Figure 1.16). The figure shows that children gain knowledge, skills, values and attitudes pertaining to the natural environment and humans on local, national and global scales. As a child develops environmental consciousness, he or she is able to consider issues such as preservation,

utilisation and ownership. One can assume that a child with a high level of geographical consciousness has the ability to understand the integration between human and ecological processes across different scales, and by gaining skills, knowledge and values this would lead to geographical-conscious behaviour such as planning and protection.
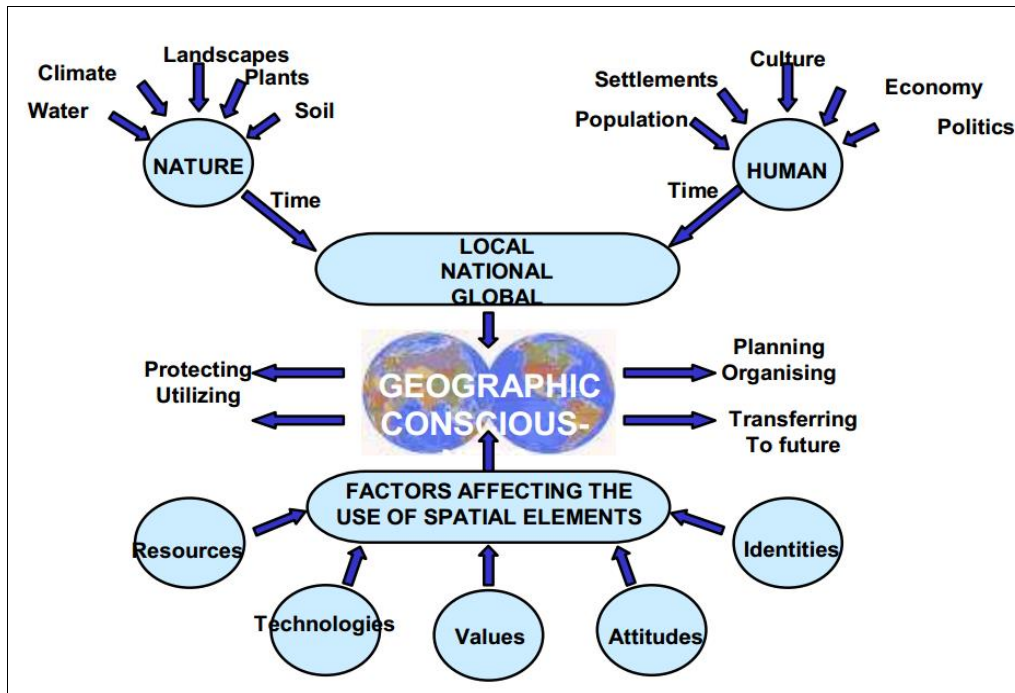


Source: Sahin, Demrialp & Karabag (2007: 30)

Figure 1.16 Elements of geographical consciousness

Considering Sahin, Demrialp & Karabag's (2007) model of geographical consciousness, it is credible that geography provides the opportunity for environmental problems to be analysed from different perspectives, as proposed by Jensen's (2002) four-dimensional model (Figure 1.17). The first dimension, 'What kind of problem is it?' refers to knowledge that draws attention and rouse our concern and willingness to act. This form of knowledge is mainly scientific and isolated which may cause 'action paralysis' as no explanation is provided about why the problem exists and how it can be solved. The second dimension, 'Why do we have the problems we have' deals with the reasons why environmental problems exist, i.e. their causes, focusing on sociological, cultural and economic spheres. The third dimension, 'How do we change things' is concerned with how an individual can contribute to society at large by embracing strategies of action. Questions such as 'Who do we turn to?' and 'With whom could we ally ourselves?' are typically asked. This involves psychological, sociological and political influences. The last dimension, 'Where do we want to go?' is the formation of dreams and visions for the future. This dimension includes knowledge about different people in different contexts. This dimension can motivate and encourage individuals to change and act.
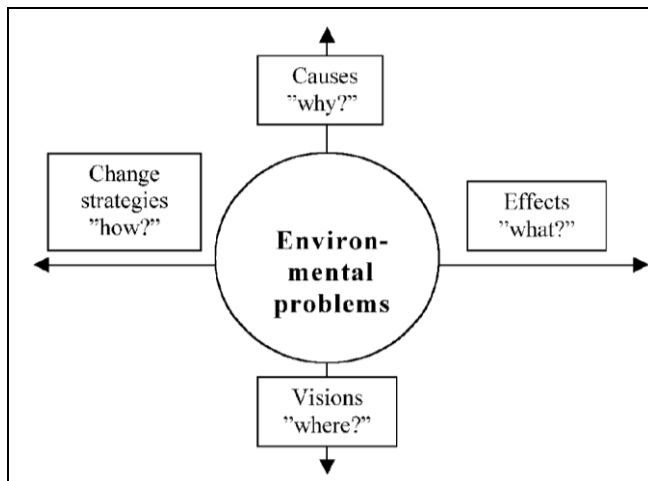
Source: Jensen (2002: 330)

Figure 1.17 Four aspects of action-oriented knowledge

The four-dimensional model incorporates geography's fundamental questions of 'what', 'where', 'when' and 'why' and, by implication, 'who' (Couclelis 2009; Smith 1974). The inherent nature of geography makes it ideal for instilling the forms of knowledge outlined by Jensen (2002). Geography can effectively develop a child's competence for taking action which will lead to behavioural change. Certainly, the importance of geography as a carrier subject of EE and PEB should not be underestimated. Since the goal of EE is to develop an individual's ability to act and affect change, geography as a carrier subject can do just that. Therefore it can be said that this study fits into behavioural geography as it aims to understand why young people in Okahandja behave a certain way toward the environment.

## 1.10    RESEARCH DESIGN

A research design is "the overall strategy that you choose to integrate the different components of the study in a coherent and logical way, thereby, ensuring you will effectively address the research problem; it constitutes the blueprint for the collection, measurement, and analysis of data" (De Vaus 2001: 8). Figure 1.18 illustrates the research design for the study. The research was executed in five phases. One, a research problem was identified which led to the development of the aim and six objectives. Phase 2 provided the conceptual basis of the study by overviewing literature on environmental behaviour, environmental attitudes and environmental education. In Phase 3 methods for the study were selected, research instruments developed and data was collected. Phase 4 comprised data capturing by using STATISTICA and Microsoft Excel software. Furthermore, findings from the questionnaires, focus group discussions, participatory drawing and transect walks were analysed and the results discussed. In Phase 5 main          findings          were          synthesised          and          summarised.
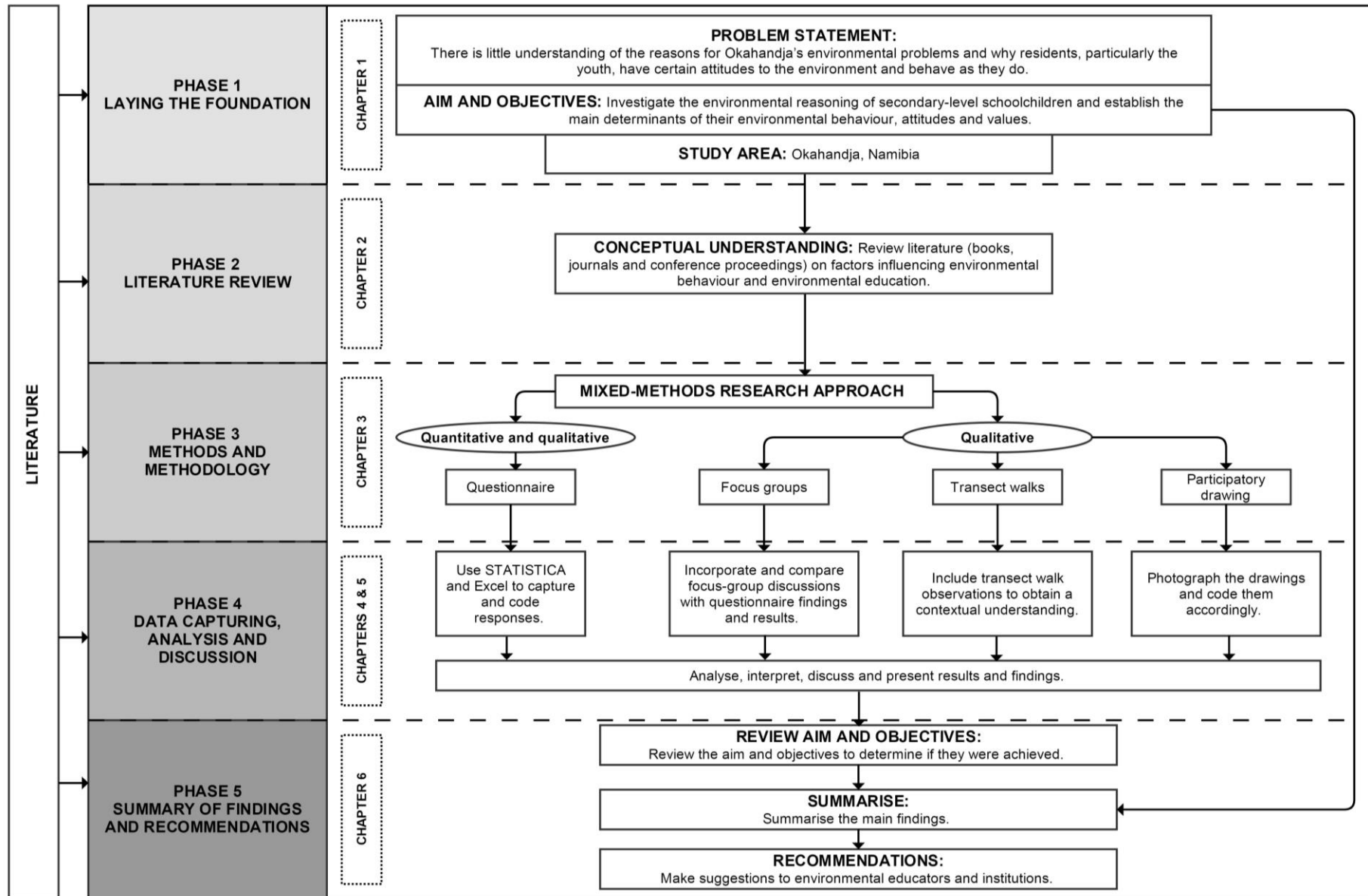
Figure 1.18 Research design for investigating the environmental reasoning of secondary-level schoolchildren

## 1.11    THESIS OUTLINE

Chapter 1 is the foundation of the study and has set the scene. It introduced the study area and the associated real world issues as well as the fundamentals of the research, namely the research problem, the overarching aim, the underlying objectives and where the study is positioned in geography. Chapter 2 lays the theoretical basis for the study by reviewing the literature. It deals with the relevant theories, concepts, models and themes discussed in the literature. Chapter 3 gives an extensive description of the methodology implemented and the methods employed to fulfil the aim of the investigation. Chapter 4 presents and discusses the findings and results of the children's responses to specific environmental behaviour factors (EBFs). These findings are compared with and corroborated by those of the focus group feedback. Based on a participatory drawing exercise, Chapter 5 reports how participants view their environments and how they want their environments to change. This is complemented or contradicted by information and understanding gained from transect walks. The format and layout of Chapter 5 are different from the other chapters and should be seen as a possible article manuscript which might be published in future. Chapter 6 summarises the main findings and provide conclusions. Possible solutions to the observed environmental problems are suggested to assist officials and educators to rethink EE and the way these problems can be managed.

# CHAPTER 2 LITERATURE REVIEW: PRO-ENVIRONMENTAL BEHAVIOUR (PEB): THE TIP OF THE ICEBERG

## 2.1 INTRODUCTION

Since the 1970s increased environmental awareness and concern about the limits of natural resources have drawn numerous scholars in the social and behavioural sciences to investigate people's environmental knowledge, attitudes and behaviour. There has been an exponential growth in research endeavours in an array of academic fields about the relationships between humans and their environments. An holistic understanding of human–environmental interactions requires an interdisciplinary approach. This review of appropriate literature therefore extends beyond the traditional boundaries of geography to include existing knowledge from EE and environmental psychology.

The investigation of a range of complex interactions between humans and their environments is particularly important in a world of increasing population growth, large-scale environmental degradation and increasing exploitation of natural resources (Bradshaw & Brook 2014). The planet's sustainability is threatened by our desires for higher standards of living and optimum comfort (Stern 2000). These trends oblige governments to implement better strategies and programmes to change or influence irresponsible consumer patterns, environmental attitudes and environmental behaviour (McCright, Xiao & Dunlap 2014). As active role players, researchers should constantly seek improved methodologies, tools, theories and models to more accurately measure or determine the nature of human–environmental relationships. Hargreaves (2012) has highlighted some environmental problems that have worsened through failed interventions and recommendations made by scholars. But by an understanding of the effects of factors such as knowledge, awareness, concern, attitudes, values and place attachment on environmental behaviour, scholars can gain valuable insights into the sustainable use of the environment and natural resources, so assisting with the development of alternative EE approaches. These factors are social, personal or psychological and they potentially influence the way people reason, think or behave in their (own) environments. To better understand environmental behaviour these underlying factors and motives that drive an individual's reasoning must be examined.

However, studies over the last 40 years have shown that answers to questions why people act environmentally as they do and what the barriers to PEB are, manifest as being extremely complex and multifaceted (Bamberg & Möser 2007; Blake 1999; Fishbein & Ajzen 1975; Grob 1995; Hines, Hungerford & Tomera 1986/87; Kollmuss & Agyeman 2002). Yet, scholars have

shed light on and offered some solutions to the conflicts between humans and the environment (Chawla 1998; Kaplan 2000; Steg et al. 2014; Van Liere & Dunlap 1980). In Schwartz's (1977) norm-activation theory, environmentally responsible behaviour is viewed as the activation of a personal moral norm by which an individual becomes aware of environmental problems and believes that environmental conditions are posing a threat to oneself, others and the biosphere. Hungerford & Volk (1990: 258) identify the need for an "environmentally responsible citizen" who is "an individual that is knowledgeable about the environment and related issues, sensitive to the environment, willing to partake in environmental conservation, possesses the skills to solve environmental problems and serves as an active agent in resolving the problems." Nordlund & Garvill (2002) found that individuals with self-transcendent values are more aware of environmental threats and have a stronger perceived obligation to protect the environment than those with self-enhancement values.[6]

This chapter aims to review the research done in the field of PEB. Because of the massive volume of this research this review concentrates on selected EBFs, namely environmental knowledge, environmental awareness, environmental concern, environmental worldview, place attachment, and socio-economic and demographic elements together with some related themes important to the execution of this research. The review will first define the term environment to clarify its use in this research. Next, a selection of conceptual models and frameworks developed to explain the gap between the possession of environmental knowledge, pro-environmental attitudes and displaying PEB are discussed. Third, the factors that influence environmental behaviour are examined in depth to show the functioning of each in different contexts. Fourth, the roles of EE as drivers of environmental awareness are outlined. Last, the chapter highlights knowledge gaps and stumbling blocks in the literature. First then, what is meant by 'environment'?

## 2.2 THE CONCEPT ENVIRONMENT

'The environment' has been variously defined over the years. The term is inherently complex and its definitions are as diverse as the wide-ranging literature in which it is used (Kopnina 2012; Reddy 2011). Environment has often been viewed as people's "personal sphere" (Smit 1989: 10) and includes everything "natural and human made" that surround human beings (Dreyer & Loubser 2005: 144). Ittelson et al. (1974) have distinguished eight characteristics fundamental to understanding the environment. Table 2.1 summarises them.

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[6] "Self-transcendence is characterized by values of universalism and benevolence…self-enhancement is defined by values of power and achievement" (Schultz et al. 2005: 458).

Table 2.1 Characteristics and descriptions of the environment

| Characteristic | Description |
|---|---|
| 1. The environment is experienced as a unitary field. | Humans perceive the environment as discrete stimuli: sound, sight, taste, touch and smell and the total constellation of these stimuli determines how individuals respond to it. |
| 2. An individual has environmental and individual psychological properties. | The individual himself/herself forms part of the environment and by understanding an individual's behaviour in a setting helps to determine the nature of the setting and the effect on his/her behaviour. |
| 3. The physical environment is embedded in and inextricably related to a social system. | Individuals respond to the environment according to their role as social beings. The functionality of groups is influenced by the nature of an environment. |
| 4. The degree of influence of the environment varies with the behaviour in question. | The milieu may act as a positive or negative reinforcement of established behaviour but may not necessarily change the direction of the behaviour. |
| 5. The environment often operates below the level of awareness. | The environment often changes when people become aware of it. The environment is frequently taken for granted until people become aware of the effects of change and have to adapt to them. |
| 6. The "observed" environment can differ from the "real" environment. | Two people can experience the same milieu in different ways. This is influenced by our background, religion, personality and perceptions. |
| 7. The environment is cognised as a set of mental images. | Perceptual distortion and expectations affect the role an individual plays in it. People develop conceptions of the places they live in and spaces they interact with. This is also influenced by socio-economic and demographic factors causing each person's cognitive environment to be different. |
| 8. The environment has symbolic value. | The meaning of the environment in terms of literal perception differs from person to person according to whether it is aesthetically pleasing or in terms of value or functionality. |

Source: Adapted from Ittelson et al. (1974)

It is clear from these descriptions of the environment that humans are an integral part of the environment, together with living organisms and non-living structures. Vreken & Rens (1997) have argued that the environment consists of independent and interacting natural, social and personal environment components. The natural environment includes all living organisms and non-living things such as the sun, water, air and soil while the social environment relates to humans and their created world such as buildings and culture. The personal environment represents one's physical, emotional, intellectual, spiritual and ethical self (Vreken & Rens 1997). The environment is therefore not only a representation of the physical or biological but also linked to human activities. To demonstrate this, Reddy (2011) uses a diagram (Figure 2.1) of how political, social, economic and biophysical factors interact to construct the environment. The environment is therefore a product of these interacting dimensions, creating a balanced life (Reddy 2011).
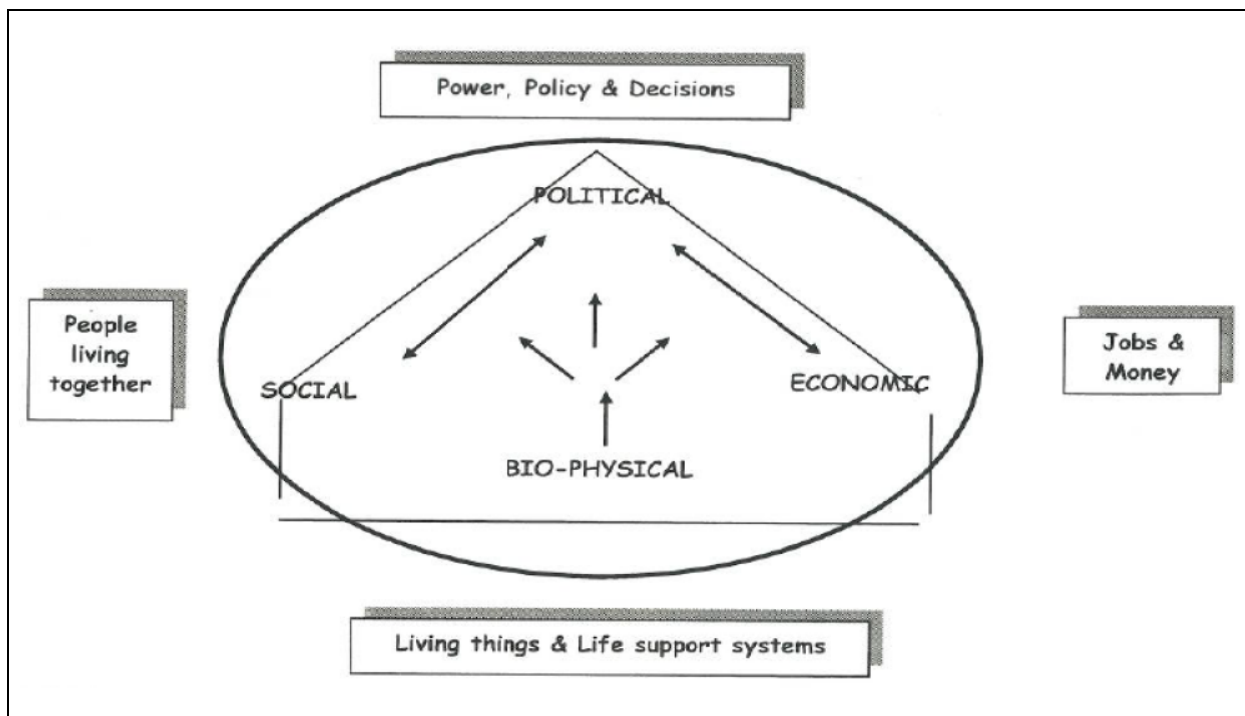


Source: Reddy (2011: 7)

Figure 2.1 Interacting dimensions of the environment

Social factors are the daily interactions of people and the operation of communities. Economic factors relate to all activities involving money, jobs and exploration. Political factors are linked to power, policy and decisions. Biophysical factors include all aspects of the natural environment, including living and non-living organisms. Reddy (2011) explains that environmental problems are often the consequence of negative socio-ecological interactions. Edwards (2011: 1) claims that these interactions have deteriorated to a state of "humanity sitting on the edge of a precipice faced with making decisions that will influence life on earth."

Similarly, environmental issues have been identified by Kassas (2002) as a function of the interactions between the biosphere (nature), socio-sphere (social, cultural and political dimensions) and the technosphere (technology and scientific knowledge) making the processes of sustainable development complex, non-linear and uncertain. Humans' desire for higher socio-economic status and more comfortable living profoundly impacts the biophysical environment. This leads to environmental problems such as loss of biodiversity, deforestation, soil erosion and pollution. This research adopts the term environment to describe both human (social, economic and political) and natural (biophysical) surroundings. Reference is also made to the natural environment which refers to all living and non-living things naturally occurring on earth. Finally the term 'nature' must be read synonymously with natural environment. In Section 2.3 pro-environmental behaviour is defined to provide a foundation for sections to follow.

## 2.3 DEFINING PRO-ENVIRONMENTAL BEHAVIOUR (PEB)

Pro-environmental behaviour is a behaviour "that consciously seeks to minimize the negative impact of one's actions on the natural and built world…" (Kollmuss & Agyeman 2002: 240). It is also variously considered to be 'everyday environmental behaviour' (Tindall, Davies, & Mauboulès 2003), 'recycling' (Schultz, Oskamp & Mainieri 1995; Vining & Ebreo 1990), 'conservation behaviour' (Monroe 2003), 'household consumption' (Gatersleben, Steg & Vlek 2002), 'transport use' (Van Lange et al. 1998) and 'household energy use' (Poortinga, Steg & Vlek 2004). PEB can also be viewed as a three-step process, namely to initiate new behaviours, to maintain the behaviours over time and to generalise the behaviours across other domains (Osbaldiston & Sheldon 2003). This means that PEB does not only involve sporadic right doing but is consistent conservation-orientated behaviour (Osbaldiston & Sheldon 2003). Stern (2000) has identified four distinct subtypes of PEB, namely environmental activism (involvement in environmental organisations); nonactivist behaviours in the public-sphere (environmental citizenship); private sphere environmentalism (personal and household impact on the environment and other environmentally significant behaviours (individual's behaviour within organisations). Pro-environmental behaviour will be discussed in greater detail in Section 2.6.

In Section 2.4 the evolution of PEB models and frameworks across the literature is discussed.

## 2.4 THE EVOLUTION OF MODELS AND FRAMEWORKS OF ENVIRONMENTAL BEHAVIOUR

Much effort has been given to proposing and testing theoretical frameworks and models for predicting environmental behaviour and determining entry points for interventions to change

such behaviour (Hargreaves 2011; Klöckner 2013). Despite the numerous studies done in these fields (Arbuthnot 1977; Dunlap & Van Liere 1978; Fransson & Gärling 1999; Gifford & Nilsson 2014; Karp 1996; Schlegelmilch, Bohlen & Diamantopoulos 1996; Steg et al. 2014; Turaga, Howarth & Borsuk 2010; Van Liere & Dunlap 1980; Whitmarsh & O'Neill 2010), answers to PEB questions and PEB barriers remain indefinite and ever-changing. In this section, the development of various models and frameworks relating to PEB are examined to provide insights into the fluid nature of the field and the difficulty in selecting an appropriate model that adequately illustrates all or most of the factors that influence environmental behaviour. The review proceeds from the early linear models to sociological pro-environmental models and concludes with a consideration of a comprehensive model of pro-environmental behaviour.

### 2.4.1   Early linear models (early 1970s)

In the field of EE the traditional thinking around environmental behaviour has been that if humans are more knowledgeable about the environment and environmental issues they would become more aware and be more motivated to act pro-environmentally. Burgess, Harrison & Filius (1998) have cited an 'information deficit model' to explain the linkage between public understanding and action. Hobson (2002) in turn calls attention to the 'rationalistic' perspective to describe the approach of emphasising awareness and knowledge to close the 'value–action' gap. This approach assumes that behaviour is a linear and rational process. Ramsey & Rickson (1976: 11) describe the essence of these traditional models of knowledge, attitudes and behaviour as: "Increased knowledge leads to favourable attitudes…which in turn lead to action promoting better environmental quality." Figure 2.2 illustrates a typical early environmental-behaviour model.
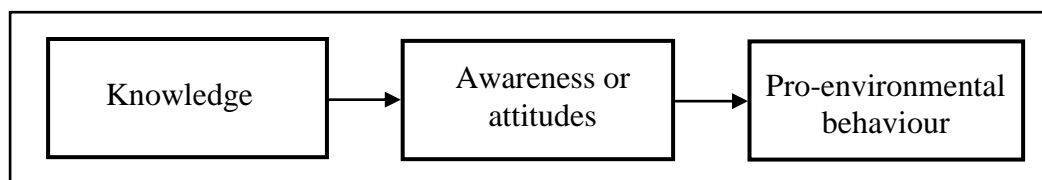


Source: Adapted from Hungerford & Volk (1990)

Figure 2.2 Structure of traditional models of pro-environmental behaviour

These models were soon proven inadequate as it was found that an increase in knowledge and awareness did not lead to a change in attitudes or an increase in PEB (Berthoû 2013; Kollmuss & Agyeman 2002; Rioux 2011). Collins et al. (2003: 14) describe the relationship between information and behaviour as follows: "Information does not necessarily lead to increased awareness, and increased awareness does not necessarily lead to action. Information provision, whether through advertisements, leaflets or labelling, must be backed up by other approaches."

This linear fashion of thinking is still apparent in everyday practices as governments, NGOs and educational institutions use information campaigns as a way to change people's environmental behaviour (Owens 2000). It has been assumed that the sheer increase in information on climate change will lead to heightened risk perceptions, but the media's framing of climate change as an unsettled controversy illustrates that information does not raise concern for global warming (Kellstedt, Zahran & Vedlitz 2008). Geographers have argued that information-intensive campaigns are likely to be fruitless because of the way environmental behaviour is defined and operationalised (Barr & Gilg 2006). These models exclude factors such as gender, social class, physical contexts and habits that quite likely influence an individual's environmental reasoning and behaviour. In addition, these models do not account for the ways different groups use information or how their perspectives on environmental behaviour differ (Owens 2000).

The discrepancy between attitude and behaviour has been addressed in *Theory of reasoned action* (Ajzen & Fishbein 1980; Fishbein & Ajzen 1975) and *Theory of planned behaviour* (Ajzen 1991). They point out that behaviour is dependent on the intention to perform the specific behaviour. Hence the stronger the intention the more likely that the behaviour will be performed. These theories highlight the need for measuring attitudes towards specific behaviours rather than general environmental issues. For example; people highly concerned about climate change tend to drive motor cars simply because driving and climate change are not closely related (Kollmuss & Agyeman 2002). The theory of reasoned action considers two independent determinants of intention: (1) the degree of favourably or unfavourably evaluation of a behaviour and (2) a subjective norm referring to perceived social pressures to perform or not to perform a behaviour (Ajzen & Madden 1986). The theory of planned behaviour (Figure 2.3) extends the theory of reasoned action by including behavioural control. Ajzen (1991: 188) avers that "The relative importance of attitude, subjective norm, and perceived behavioral control in the prediction of intention is expected to vary across behaviors and situations." Therefore, the type of behaviour and the nature of the situation can influence the magnitude of the perceived behavioural control–intention relationship. Influences like the availability of resources, opportunity and a person's belief of the difficulty to perform a specific behaviour dictate the likelihood of behaviour achievement (Ajzen & Madden 1986). A person's belief about behavioural control can be influenced by past experience, information obtained and the perceived difficulty of the behaviour. Behaviour is therefore a function of information and beliefs relevant to the behaviour (Ajzen 1991; Ajzen & Madden 1986).
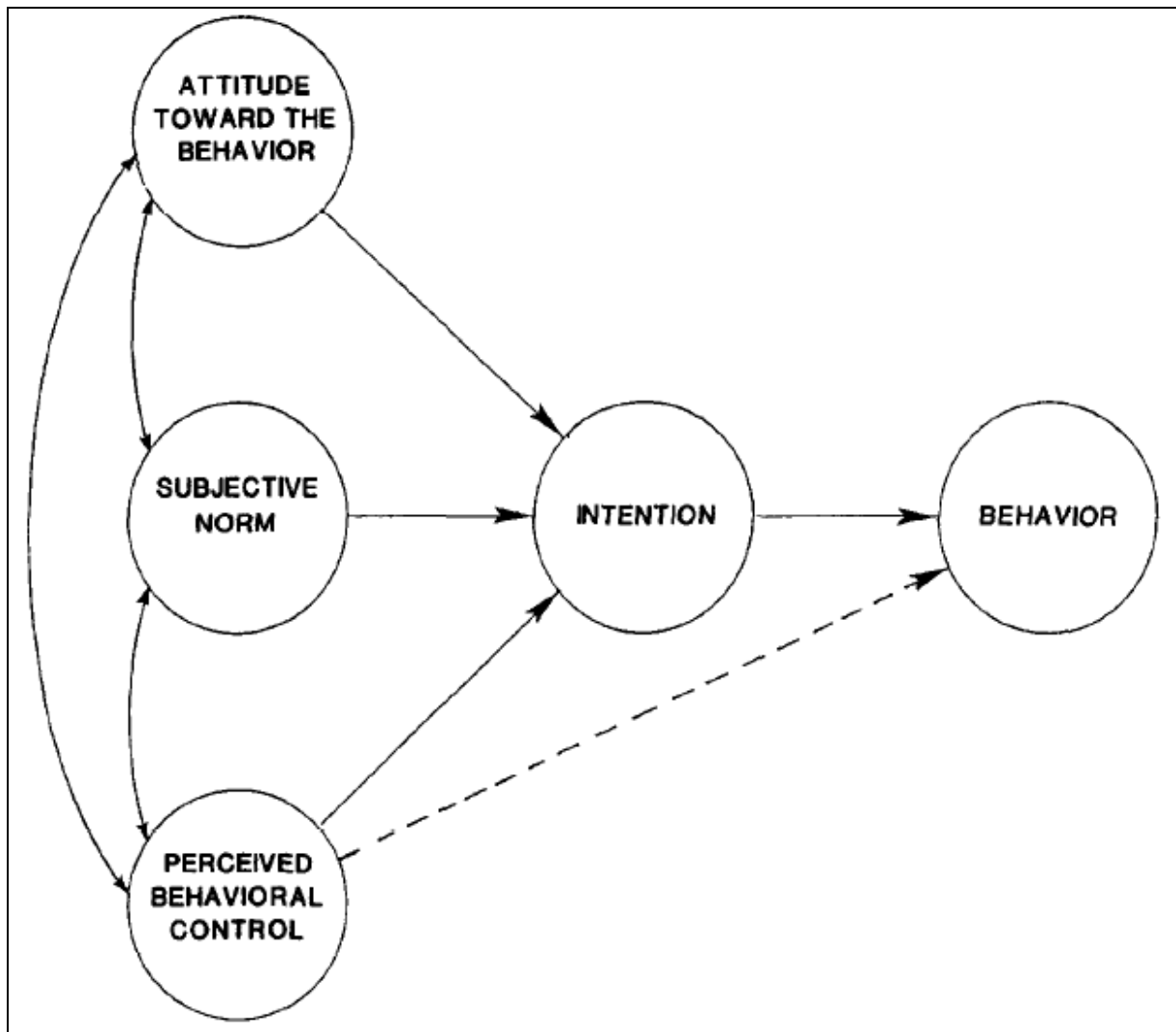
Source: Ajzen (1991: 182)

Figure 2.3 Illustration of the theory of planned behaviour

The model of responsible environmental behaviour (Figure 2.4) proposed by Hines, Hungerford & Tomera in (1986/87) is based on Ajzen and Fishbein's theory of planned behaviour. They undertook a meta-analysis of 128 studies on environmental behaviour to determine which variables appear to be most influential in motivating PEB. They reasoned that the intention to act is an artefact of other variable combinations. Therefore, before individuals can take action they must be aware of the problem and be cognisant of available and effective solutions to the problem. This differs from Ramsey & Rickson's (1976) reasoning concerned environmental knowledge as the focus is also placed on the conversion of knowledge to skills. To distinguish between the two, Hines, Hungerford & Tomera (1986/87) included two knowledge categories in their model, namely knowledge of issues and knowledge of action strategies. Skill itself is not sufficient for PEB as the individual must also desire to do the 'right' thing. This desire is influenced by attitude, locus of control and personal responsibility (Fransson & Gärling 1999).
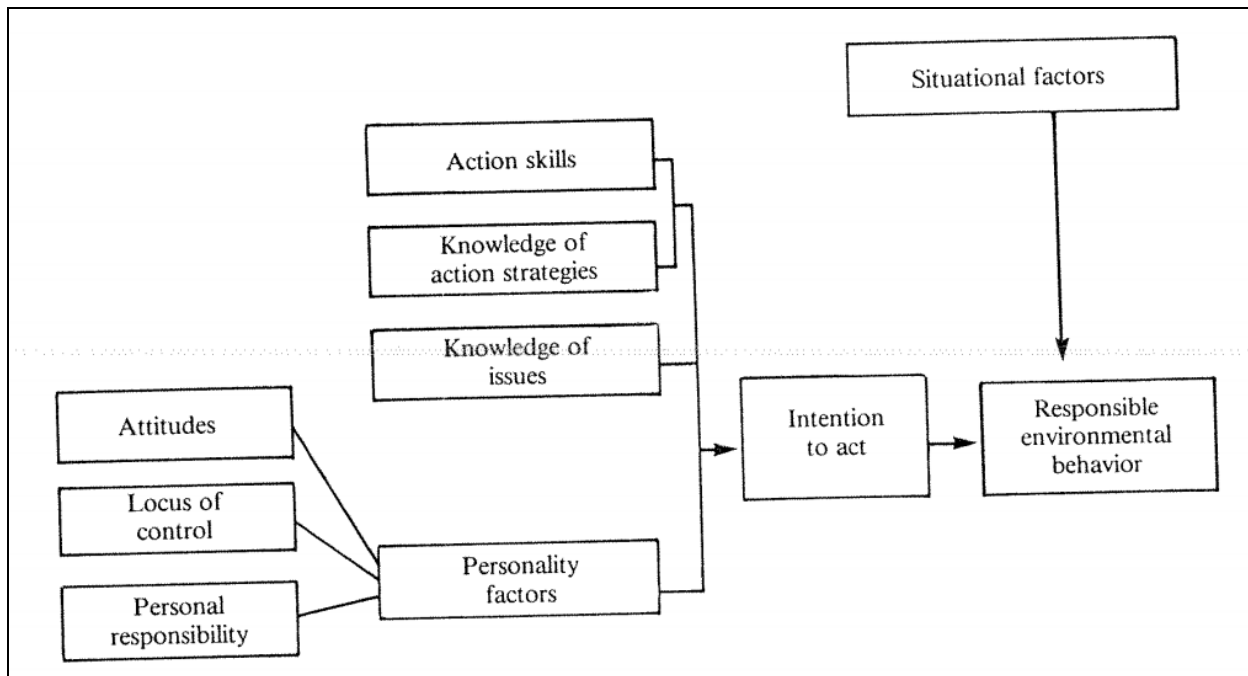
Source: Hines, Hungerford & Tomera (1986/87: 7)

Figure 2.4 Model of responsible environmental behaviour

Kollmuss & Agyeman (2002) point out that even though Hines, Hungerford & Tomera's (1986/87) model is more sophisticated than Ajzen & Fishbein's (1980) model, the relationship between knowledge, attitudes and actual behaviour are weak. The model includes situational factors to illustrate that many more factors can influence environmental behaviour. Situational factors involve social pressures, economic constraints and the availability of opportunity. In Subsection 2.4.2 Blake's (1999) 'value–action gap' diagram is briefly discussed as an example of a sociological pro-environmental model.

### 2.4.2   Sociological pro-environmental models

Blake (1999) has provided a diagram illustrating the barriers between environmental concern and action. Addressing the barriers will assist overcoming the 'value–action gap' in environmental policy (Figure 2.5). The diagram presents institutional and psychological factors that can affect an individual's action. The obstacles between concern and action are grouped into three categories, namely individuality, responsibility and practicality. Individuality refers to an individual's attitudes and cognitive structure. Attitudes such as laziness or lack of interest cause environmental concern to be overshadowed so hindering PEB. Responsibility relates to the influence social and external factors have on an individual's evaluation of environmental action. Barriers to responsibility include the feeling of helplessness and a lack of efficacy as well as the lack of trust between members of society or institutions. Practicality is somewhat similar to the Hines, Hungerford & Tomera (1986/87) variable of situational factors. These include lacks of

money, time, information and encouragement. While an individual might have a strong sense of individuality and responsibility, but if there is a shortfall regarding practicality PEB will be hindered. Blake's (1999) model is particularly useful in that both institutional (external) and psychological (internal) factors are incorporated, but it neither accounts for underlying social norms such as culture nor for psychological factors such as the reasons for a lack time or an information deficit.
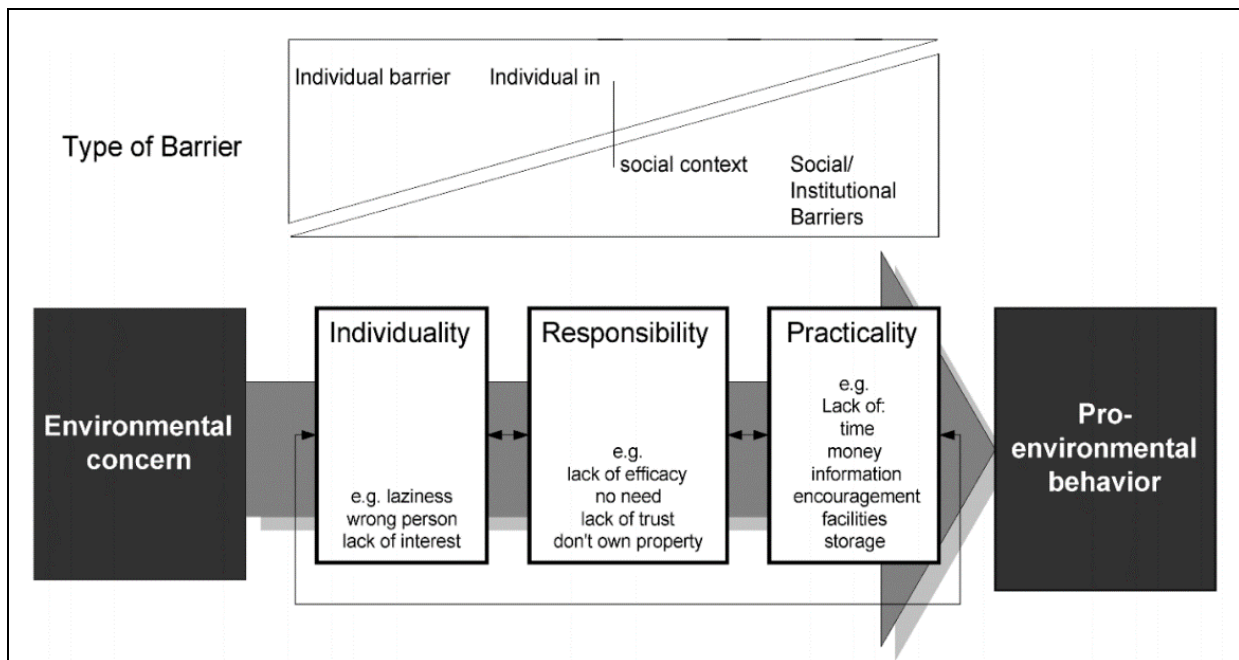
Figure 2.5 Barriers between environmental concern and action

In Section 2.4.3 Kollmuss & Agyeman's (2002) model of pro-environmental behaviour is explained. Their model has been influenced by various authors and previous models making it more comprehensive.

### 2.4.3   A comprehensive model of PEB?

Despite Kollmuss & Agyeman's (2002) pointing out that developing a model that incorporates all the factors of PEB might be neither feasible nor useful, they did develop a model of PEB primarily as a visual aid for categorising the factors (Figure 2.6). The model is shaped by Fietkau & Kessel's (1981) model of ecological behaviour and it includes internal and external factors. Similar to the Fietkau & Kessel (1981) model, Kollmuss & Agyeman's (2002) model does not incorporate a direct relationship between environmental knowledge and PEB because the latter model regards environmental attitudes, values, knowledge and emotional involvement as a complex construct called 'pro-environmental consciousness'. External systems incorporate all factors ranging from a person's social context and economic situation to political determinants.

Kollmuss & Agyeman (2002) argue that PEB is achieved when internal and external factors act synergistically. The black boxes indicate barriers to PEB with old behaviour patterns being the largest barrier.
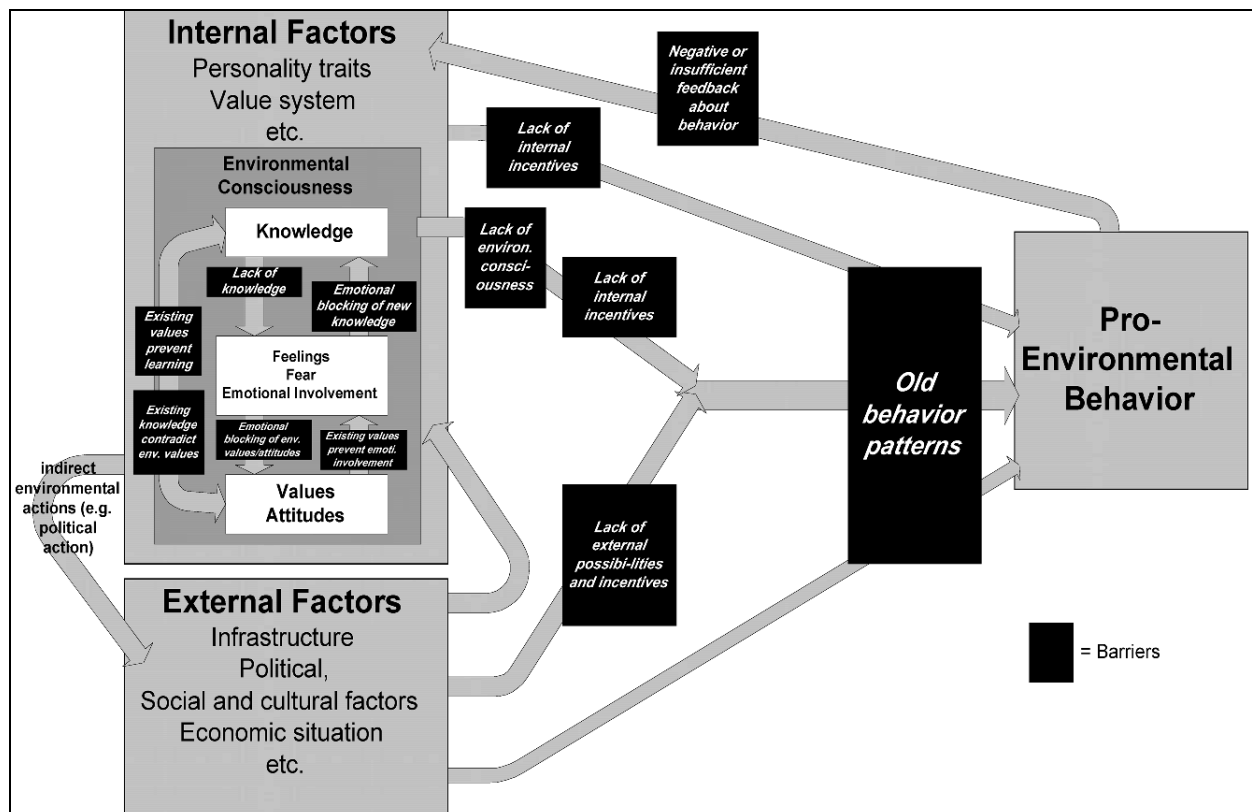


Source: Kollmuss & Agyeman (2002: 257)

Figure 2.6 Model of pro-environmental behaviour

From this review of various models, diagrams and frameworks in the field of environmental behaviour, it is clear that no single model adequately explains and illustrates all the factors that influence PEB. It is equally apparent that PEB is a complex, dynamic, interlinking system of different variables and factors. Most of the appraised models incorporate similar factors, namely attitudes, knowledge, internal drivers (motivation, intention to act, desire to act) and external forces that can either hinder or enable individuals to behave pro-environmentally. Klee & Todt in Bogner & Wiseman (2002) have claim that a network of up to 19 variables are necessary to explain environmental behaviour in which environmental attitudes are being covered only by one of the variables. The models and approaches have their different strengths to aid a choice for application in this research, but this very wide variability led to not adopting or applying a specific PEB model, rather to a borrowing from more than one at appropriate stages in the research. Moreover, the terminology used in PEB studies is varied with scholars referring to 'determinants', 'variables' and 'barriers', to name a few. In this research the term 'factors' is

adopted as the influencing and determining agents of PEB. These environmental behaviour factors are scrutinised in the next section.

## 2.5 ENVIRONMENTAL BEHAVIOUR FACTORS (EBFs)

Selected EBFs are discussed to provide an understanding of their role as drivers of PEB. They are arranged under the rubrics of environmental worldview, environmental knowledge, sense of place, and socio-economic and demographic factors.

### 2.5.1   Environmental worldview: concern, values and attitudes

This category of EBFs is subdivided into environmental concern, environmental values and environmental attitudes. Each is treated in turn.

2.5.1.1 Environmental concern

Earlier sociology was based on pre-paradigmatic perspectives such as ethnomethodology, Marxism and conflict theory all of which were grounded in anthropocentrism (Catton & Dunlap 1978). Anthropocentrism, which formed the basis of the sociological worldview, is termed the human exceptionalism paradigm (HEP) (Catton & Dunlap 1978) or the dominant social paradigm (DSP) (Dunlap & Van Liere 1978). The discipline's worldview focused on humans and the neglect of habitats and physical circumstances (Michelson 1976). Sociology also did not recognise the biogeochemical limits to material progress (Catton & Dunlap 1978; Nooney et al. 2003). This traditional sociological worldview denied that *Homo sapiens* is not the exceptional species but that the exceptional characteristics of our species (language, culture and technology) somehow exempt us from environmental influences and constraints (Dunlap & Catton 1979). Terminology such as 'carrying capacity' was alien to most sociologists as the possibility of scarcity was unforeseen (Catton & Dunlap 1978).

An awareness of the environment led sociologists to rethink sociological purity so resulting in the development of environmental sociology. As their interests shifted, sociologists started to incorporate resource management, natural hazards and outdoor recreation into their thinking (Catton & Dunlap 1978). The energy crisis of 1973 compelled sociologists to begin to explore the effects of resource constraints on society. A change in thinking was crucial as societies that flourish because of overexploiting ecosystems were threatening the basis of their own survival (Dunlap & Catton 1979). This led to the development of the new environmental paradigm (NEP) (Dunlap & Van Liere 1978) and the replacing in industrial societies of the DSP with the NEP. While the DSP rests on an anthropocentric view, the NEP leans toward an ecocentric view. The NEP views humans as a species interdependently involved in the biotic communities with

linkages of cause and effect on nature (Merchant 1990). Unlike the DSP, the NEP regards human beings as part of the natural world in which they are governed by the same rules as the rest of nature (Corral-Verdugo & Armendáriz 2000).

Dunlap & Van Liere (1978) composed a NEP scale reflecting NEP tenets such as limits to growth and anti-anthropocentrism. Dunlap et al. (2000) argue that the content validity of the NEP scale is questionable because of the amorphous meaning of the environmental paradigm or worldview. Kempton, Boster & Hartley (1995) confirmed the major dimensions of the NEP scale to be balance of nature, limits of growth and human dominance. While NEP is often used as a global measure of environmental concern, its true purpose was to measure the shift in environmental worldview in the general public (Nooney et al. 2003). The most typical use of the scale is to test "whether the underlying anthropocentric or ecocentric dominated orientation channelled the views of the respondents" (Crick-Furman & Prentice 2000: 70). Therefore, a person who scores high on the NEP scale is pro-ecological and is more likely to be support actions that would enhance the environment. High NEP scores are expected to lead to pro-environmental beliefs and attitudes but barriers and opportunities can hinder the NEP-behaviour relationship (Gardner & Stern 1996). The scale therefore measures the relative agreement of individuals about the relationship between humans and the environment (Corral-Verdugo & Armendáriz 2000). Items measuring commitment to the DSP were inversely related to environmental concern (Dunlap & Van Liere 1984). Therefore, high NEP scores indicated environmental protective attitudes (Van Petegem & Blieck 2006). The NEP scale has not only been used to measure environmental (or ecological) worldview or concern but also environmental attitudes, environmental beliefs and values, so illustrating of the ambiguity inherent in these phenomena as well as Dunlap and Van Liere's failure to ground the NEP in socio-psychological theories (Stern, Dietz & Guagnano 1995).

The original NEP scale (Dunlap & Van Liere 1978) was revised by Dunlap et al. (2000). Various scholars have used the scale (Bechtel, Verdugo & de Queiroz Pinheiro 1999; Clark, Kotchen & Moore 2003; Corral-Verdugo & Armendáriz 2000; Johnson, Bowker & Cordell 2004; Poortinga, Steg & Vlek 2004; Rideout et al. 2005) to measure adults' perceptions of the environment. Ogunbode (2013) used the NEP scale to examine the environmental attitudes of 355 university students in Nigeria. Manoli, Johnson & Dunlap (2007) revised and reconstructed a NEP scale for use with children aged 10 to 12 years in the United States. The NEP scale for children has also been used to measure children's environmental attitudes in other contexts, such as China (Wu 2012).

Environmental concern can refer to a specific attitude determining intensions, a general attitude or value orientation (Fransson & Gärling 1999). Environmental concerns also directly relate to the degree to which individuals see themselves as part of the natural world (Schultz 2000). Environmental concern is frequently measured according to the value-belief-norm (VBN) theory. VBN theory is based on three value-based concerns, namely egoistic, social-altruistic, and biospheric. Even though Batson (1994) and Batson et al. (1995) do not specifically incorporate environmental behaviour into their research, they follow the same argument Stern & Dietz (1994) do, namely that people usually have four motives for acting for the public good. These motives are egoism, collectivism, altruism, and principlism. *Egoism* is a self-interest motive with the goal being one's own welfare. Egoistic values "predispose people to protect aspects of the environment that affect them personally, or to oppose protection of the environment if the personal costs are perceived as high" (Stern & Dietz 1994: 70). *Collectivism* is a motive that considers the welfare of people as collective entities. A hypothesis proposed by McCarty & Shrum (2001) suggested that people who are more collectivistic are more concerned with the good of the group and the goals of the group and are therefore more likely to participate in recycling compared to an individualist. Individuals acting with *altruistic* motives are people aiming to increase the welfare of one or more individuals other than themselves. Altruistic-minded individuals are concerned about the costs and benefits of environmental issues for the well-being of all humanity. Altruism takes place when an individual focuses beyond himself and considers others (Allen & Ferrand 1999). This altruistic state of actively caring occurs when an individual's needs for belonging, self-esteem and personal needs have been satisfied (Geller 1995). *Principlism* or biospheric environmental concern serves the role of upholding some moral principle in order to improve the quality of life for all living organisms.

Therefore, two people can express concern about the same problem for fundamentally different reasons. Schultz (2000) proposed that a people's notion of self and the degree to which they consider themselves dependent or interdependent from other people or living things will determine their environmental concern. Similar to Schwartz & Bilsky's (1990) view, Schultz & Zelezny (1999) take a standpoint of self-transcendence and self-enhancement. Self-transcendence is the degree to which someone's personal values and ideals are not directly linked to the notion of self, whereas with self-enhancement there is a strong correlation between goals and ideals for oneself and the rewards thereof. Both groups will express some form of support for the environment but their underlying motives differ radically. Schultz & Zelezny (2003) believe that environmental messages have been focused on people with self-transcendent values

who reject personal wealth, materialism and success. The messages of sacrifice for environmental protection will therefore not be persuasive to others.

Many studies support the contention that a pro-ecological orientation or 'seeing the world ecologically' leads to pro-environmental beliefs and attitudes on a range of issues (Pierce, Dalton & Zaitsev 1999; Stern, Dietz & Guagnano 1995). It is important to note some of the terms used in the literature on environmental worldview, namely 'pro-ecological' and 'anti-ecological' (Dunlap & Van Liere 1978), nature values such as 'instrumental' and 'non-use' (Winter & Lockwood 2004), 'social-altruistic' and 'biospheric' orientations (Stern & Dietz 1994) and Ignatow's (2006) distinct relationship between the 'ecology model' and the 'spiritual model'. This research adopts the terms 'anthropocentric' and 'ecocentric' worldviews propounded by Attfield (2003). These worldviews indicate a person's ecological orientation and values toward nature which helps to shape attitudes, decision making and behaviour toward the environment. Thompson & Barton (1994) describe anthropocentrics as utilitarian because they feel that the environment should be protected to satisfy, maintain and enhance the quality of life for humans. In contrast, individuals with an ecocentric worldview reason that all ecosystems should be protected for their own intrinsic value. However, anthropocentrics are less likely to compromise their own comfort and wealth status for the protection of the environment while ecocentric individuals act in support of the environment even if it involves expense, inconvenience and discomfort (Thompson & Barton 1994). Of course, a third group also exists, namely those who have negative attitudes toward the environment and act apathetically towards the environment (Thompson & Barton 1994).

Stern et al. (1995) have contended that the two concepts (anthropocentric and ecocentric) do not necessary exist in the minds of the general population. Eckersley (1992: 33) holds that ecocentrism and anthropocentrism are "…the opposing poles of a wide spectrum of differing orientations towards nature." Uyeki & Holland (2000) agree that the environmental worldview measures two extremes of a continuum and that people can seldom be distinctively classified as one of the two but that most people will fall between these two extremes. Variations in the strength of ecocentrism or anthropocentrism are also possible across the continuum (Kopnina 2012). Moreover, there is a great degree of difficulty in distinguishing the environmental worldviews of individuals because they are often uncertain about their own environmental stance and their reasoning might change depending on the situation presented (Uyeki & Holland 2000).

Some studies have shown that a relationship exists between high environmental concern and PEB, recycling being a prime example (Arbuthnot & Lingg 1975; Kellgren & Wood 1986;

Simmons & Widmar 1990). Other studies, however, have found no relationship between general environmental concern and recycling (Oskamp et al. 1991; Vining & Ebreo 1990). These inconsistencies have been ascribed to (1) low correlations among environmental behaviours; (2) attitudes and behaviour being measured on different levels of specificity; (3) the effects of different variables and factors; and (4) a lack of measurement reliability and validity (Mainieri et al. 1997). Knight & Messer (2012: 535) have concluded that "…environmental concern is a complex, multidimensional facet of environmentalism that cannot be explained by a single variable or measure."

In this lengthy discussion of environmental concern it is important to note that environmental worldview has not only been used to describe a person's ecological orientation but also their attitudes and concern toward the environment. Also, an individual's environmental behaviour can be influenced by their values, motives and the situation presented. This subsection has illustrated the interconnectivity of environmental concern, environmental attitudes, environmental values and environmental behaviour.

2.5.1.2 Environmental values

Values are principles that guide an individual's life, and the clustering of values forms an individual's value orientation (Hedlund 2011). According to Stern and Dietz (1994), attitudes of concern about environmental problems are based on an individual's more general set of values. Therefore, values and attitudes are just two orientations among many others that can be used to determine individuals' actual behaviour in specific situations (Uyeki & Holland 2000). Thompson & Barton (1994) highlight the importance of not only understanding people's attitudes toward the environment but also their values and motives that cause them to reason in a specific manner (See Subsection 2.5.1.1). There is a consensus that our thinking, attitudes and behaviour towards the environment are influenced by our values (e.g. Olson & Zanna 1993). Our values influence our decision making, causing us to have behavioural priorities and preferences. Kollmuss & Agyeman (2002) noted that values are also responsible for shaping much of our intrinsic motivation. Values therefore act in a tandem with other factors when making decisions (Dietz, Fitzgerald & Shwom 2005). The question of what shapes our values is a complex one.

Similar to Van Staden & Loubser's (1995) model of the ecological systems that influence the development of a child, Fuhrer et al. (1995) hypothesised that an individual's values are most influenced by the 'microsystem' which comprises the immediate family, neighbours and peers, then to a lesser extent by the 'exosystem' such as the media, and least influential, nevertheless important, is the influence of the 'macrosystem', the cultural context in which an individual

lives. Uyeki & Holland (2000) ascribe the weak relationship between values and environmental behaviour to the disconnect between people's core values and their concern about the environment.

Even though this study does not measure the environmental values of secondary-level schoolchildren, the importance of values should not be underestimated. Moreover, the ecological systems and role models that influence children's environmental values should be investigated. In Subsection 2.5.1.3 environmental attitudes are briefly explained.

2.5.1.3 Environmental attitudes

Eagly & Chaiken (1993: 155) insist that "people who hold positive attitudes should engage in behaviours that approach, support, or enhance the attitude object, and people who hold negative attitudes should engage in behaviours that avoid, oppose, or hinder the object." Environmental attitudes are therefore a psychosocial variable that describes a person's feelings toward a specific environmental aspect or problem and feelings about resolving these problems (Hines, Hungerford & Tomera 1986/87; Pe'er, Goldman & Yavetz 2007). Hence, environmental attitudes apply to general feelings toward ecology and the environment, feelings and concern for specific environmental issues, and feelings about acting to remedy environmental problems. Moreover, general attitudes form part of a person's cognitive system and are regarded as important predictors of behaviour (Heberlein & Black 1976; Meinhold & Malkus 2005; Pe'er, Goldman & Yavetz 2007). Ignatow (2006) asserts that citizens' environmental attitudes are shaped by cultural models of human–environmental interactions. This creates a mental model enabling individuals to interpret observations and make inferences which then influence their decisions on behaviour. Attitudes differ from values in that attitudes are positive or negative evaluations of something quite specific as opposed to values that are more general (Dietz, Fitzgerald & Shwom 2005). As pointed out in the previous section, attitudes are classified under individuality which is one of the Blake's (1999) barriers to action. An individual's environmental concern is therefore often overshadowed by other conflicting attitudes (Kollmuss & Agyeman 2002). For this reason, research efforts now focus more on *when* attitudes predict behaviour rather than *if* attitudes predict behaviour (Cottrell 2003).

Definitions of environmental worldview, attitudes and concern differ markedly in the literature and a wide array of research instruments have been developed and used to measure these constructs (Dunlap & Van Liere 1978; Ignatow 2006; Stern & Dietz 1994; Winter & Lockwood 2004). This section has also clarified that environmental concern, values and attitudes are interconnected and form a part of a nested system that can influence an individual's behaviour.

Equally clear is that debate on the issue of environmental worldview will continue given its complexity and the consequent challenges of measuring and fully understanding it. Environmental worldview remains a grey area in our understanding PEB but it does give some indication of the attitudes, concerns and values of those in question. Environmental worldview can also assist EE teachers and inform policy-management strategies. Saylan & Blumstein (2007) believe that the teachings of a worldview should be incorporated into EE so that people can learn to accept some inconveniences to ensure the sustainability of the environment. Ignatow (2006) has alerted scholars to the global diversity of environmental worldviews due to the uniqueness and differentness of communities across the globe. In Subsection 2.5.2 environmental knowledge is discussed as the next EBF.

### 2.5.2   Environmental knowledge

Hines, Hungerford & Tomera (1986/87) specify knowledge of the environment as the cognition of environmental threats and issues as well as the solutions to these issues. It has been established that environmental knowledge leads to a greater likelihood of environmental protection (Ajzen 1985; Cottrell 2003; Haron, Paim & Yahaya 2005; Hines, Hungerford & Tomera 1986/87; Kaiser & Fuhrer, 2003; Kollmuss and Agyeman, 2002; Kortenkamp & Moore 2001; Mobley, Vagias & DeWard 2010; Oğuz, Çakci & Kavas 2010; Zsóka 2008). Research on adolescents has also indicated that an increase in their environmental knowledge results in greater levels of PEB (Hausbeck, Milbrath & Enright 1992; Lyons & Breakwell 1994; Meinhold & Malkus 2005; Tikka, Kuitunen & Tynys 2000).

According to Hines, Hungerford & Tomera (1986/87) and Hungerford & Volk (1990), knowledge is a prerequisite for environmental behaviour, awareness and concern because individuals must be aware of particular problems and their effects for them to behave pro-environmentally. Grob (1995) agreed by hypothesising that the more people know about the environment, the more likely they are to behave in environmentally-responsible ways. Grob (1995) also assumes that the more an individual recognises environmental problems, the more responsible he or she will behave. This notion is supported by Dunlap & Van Liere (1978) and Guagnano (1995) who found that individuals who became aware of the negative consequences of their actions on the environmental, and accepted their responsibility were more willing to partake in environmental protection. De Young (1989) found that the attitudes and motives of recyclers and non-recyclers were not much different but there was a noteworthy difference in their operational knowledge. Similarly, Granzin & Olsen (1991) found that people who recycle devote a substantial part of their time reading and learning about the environment. Kennedy et al. (2009) have reported that more than 60% of respondents felt their PEB was hindered by a lack of

knowledge. Interestingly and unexpectedly, Kellstedt, Zahran & Vedlitz (2008) found that the more information an individual has about global warming, the less concerned he or she is. This is consistent with the findings of Durant & Legge (2005) on genetically-modified foods and Evans & Durant (1995) on embryo research.

A lack of knowledge or self-perceived knowledge can cause individuals to make environmentally-wrong decisions (Vicente-Molina, Fernández-Sáinz & Izagirre-Olaizola 2013). The 'objective' model of behavioural change by MacNaghten & Jacobs (1997: 10) assumes that inaction is determined by people's 'ignorance about environmental issues'. He et al. (2011) argue that while knowledge may not necessarily change attitudes or behaviours people must possess factual knowledge and have an understanding of the environment to avoid mistakes in ignorance. Also, when an individual lacks knowledge to guide behaviour it can lead to confusion (Kearney & DeYoung 1995). An individual may not necessarily know how to execute a specific behaviour, how to change current behaviour or how to prevent the reoccurrence of certain problems, so creating constraints outside their control (Cottrell 2003). The reasonable person model stipulates that when people are unable to solve problems or implement solutions they can become discouraged and feel helpless (Kaplan 2000). Therefore, it is more important to have the skills to execute particular action rather than merely having the knowledge about the action strategies (Hungerford & Volk 1990).

From the above it is clear that the relationship between knowledge and PEB is uncertain, highly variant and complex (Zsóka et al. 2013). Environmental knowledge, commitment and PEB are highly interconnected and strongly interrelated (Arbuthnott 2009; Bamberg & Möser 2007; Kollmuss & Agyeman 2002; Zsóka et al. 2013). But, environmental knowledge and PEB do seem to strengthen each other. However, the weak relationship between knowledge acquisition and PEB is a well-reported phenomenon (Bartiaux 2008; Cleveland, Kalamas & Laroche 2005; Kaiser & Fuhrer 2003; Laroche, Bergeron & Barbaro-Forleo 2001; Maloney & Ward 1973; Van Liere & Dunlap 1981; Zsóka et al. 2013). According to Kollmuss & Agyeman (2002: 257) there is no apparent correlation between knowledge and PEB because "…the longer the education, the more extensive is the knowledge about environmental issues. Yet more education does not necessarily mean increased pro-environmental behaviour." This is supported by Kempton, Boster & Hartley (1995: 250) who aver that "…environmental knowledge *per se* is not a prerequisite for pro-environmental behaviour…." (p. 250). Jensen (2002) offers two reasons why knowledge is not necessarily translated into behavioural change. First, the traditional environmental knowledge taught is not action orientated and, second EE is often focused on

passing on knowledge to students without giving them opportunities to internalise that knowledge (Jensen 2002).

Despite the contrasting findings in the literature, the researcher is of viewpoint that an individual must be aware of and have knowledge about the consequences his/her behaviour has on the environment. The fact that this research deals with secondary-level schoolchildren as informed and educated individuals, a contribution can be made toward the link between environmental knowledge and how young people think about their local environment. In the next subsection the relationship between sense of place and PEB is investigated.

### 2.5.3   Sense of place

Williams (in Kaltenborn 1997) has pointed out that the concept of place has at least three common meanings in social science, namely (1) the spatial distribution of economic and social activities; (2) the setting for everyday routine; and (3) the emotional identification with place. In geography the concept of place is a unit describing the integration of natural and social science concepts of the environment (Patterson & Williams 2005; Sack 1997). According to Vandemark (2007: 242) "Geographers are concerned with how people conceptualize space and place and with the impact this has on self-identity, sense of belonging, and participation in society." Thus place is constructed by infrastructure, people, landscapes as well as sociocultural processes (Kaltenborn 1997). Geographers also investigate people's emotional and behavioural response to environments (Vandemark 2007). Kellert (2012) refers to the intimate and emotional connection people have with places, creating a spirit of place. Kaltenborn (1997) describes the basic structure of a place as an intertwined system of perceptions, traditions and values that creates a fluid and idiosyncratic concept of place. Regarding the natural environment, greater emphasis has been placed on "understanding the subjective, emotional and symbolic meanings associated with natural places and the personal bonds or attachments people form with specific places or landscapes" (Williams & Vaske 2003: 831). Environmental psychologists describe the person–place bond as an emotional investment in a place (Hummon 1992), feelings of pride (Twigger-Ross & Uzzell 1996) and a general sense of well-being (Harris et al. 1995). Brown, Perkins & Brown (2004) assert that physical settings are expressive and create messages about neighbourliness, resident identity, pride and commitment.

Investigations of people–places relationships have led to the development of various terms to describe the phenomenon. The heterogeneity can be partly attributed to differences in ontological and epistemological perspectives of scholars' disciplinary origins (Kyle & Chick 2007). A term for people–places relationships were first proposed by the humanistic geographers Relph (1976)

and Tuan (1974). They referred to the term 'sense of place' to explain the affective tie humans attain toward their surroundings. Stedman (2002: 563) defines sense of place as "a collection of symbolic meanings, attachment and satisfaction with a spatial setting held by an individual or group." Turner & Turner (2006) advance that sense of place generally consists of (1) physical characteristics of the environment; (2) affect, meanings, connotations and denotations associated with place; (3) activities in place; and (4) social interactions with place. Sense of place is a broad and encompassing concept which includes place attachment, place identity and place dependence (Jorgensen & Stedman 2001). Scholars following a psychological approach often use sense of place as a combination of two concepts: place attachment and place meaning (Stedman 2002; Stokowski 2002; Trentelman 2009; Van Patten & Williams 2008). These two concepts are discussed in the next two subsections respectively.

2.5.3.1 Place attachment

Place attachment, an integrative and multifaceted concept characterising the bonding between individuals and their associated environments, has drawn significant attention in the international literature (Altman & Low 1992; Proshansky, Fabian & Kaminoff 1983; Scanell & Gifford 2010; Vaske & Kobrin 2001). Part of this increased interest stems from the awareness that person–place bonds and connections have been threatened by globalisation and environmental problems (Ramkissoon, Weiler & Smith 2012; Sanders, Bowie & Bowie 2003). The concept of place attachment is frequently used in disciplines and fields like geography, environmental design and environmental psychology that are concerned with human–environment relations (Milligan 1998). There is wide agreement among scholars (Altman & Low 1992, Proshansky, Fabian & Kaminoff 1983; Scanell & Gifford 2010; Vaske & Kobrin 2001) that place attachment is a complex and multifaceted phenomenon. The continuing theoretical development of the concept has precluded agreement on a general definition (Scannell & Gifford 2010). Kyle et al. (2003: 250) conceptualised place attachment as "the extent to which an individual values or identifies with a particular environmental setting." It is important to recognise that social ties, belongingness to a neighbourhood and relationships with other people in a place also shape place attachment (Altman & Low 1992; Riger & Lavrakas 1981). The spatial level (neighbourhood rather than city) at which attachment is investigated plays a significant role as individuals can develop attachment to places with a smaller range (Hidalgo & Hernández 2001). Civic attachment does not depend on pristine physical quality only as it is also derived from other socio-economic and cultural factors (Scannell & Gifford 2010).

Researchers often distinguish between place identity and place dependence in place attachment (Kyle et al. 2003). Place identity refers to "those dimensions of the self that define the

individual's personal identity in relation to the physical environment by means of a complex pattern of conscious and unconscious ideas, beliefs, preferences, feelings, values, goals and behavioural tendencies and skills relevant to this environment" (Proshansky 1978: 155). Place identity therefore refers to the incorporation of place characteristics into one's self-concept. Place dependence refers to the goal-directed or functional connection individuals have with a place (White, Virden & Van Riper 2008). Vaske & Kobrin (2001) argue that place dependence is tied to the potential of a place to satisfy an individual's needs through preferred activities in a setting.

After the brief discussion of place attachment, place meaning as a contributing concept to sense of place is explained in the next subsection.

2.5.3.2 Place meaning

Place meaning has been called the "symbolic meaning that people ascribe to settings" by Kudryavtsev, Stedman & Krasny (2012: 232) and it is rooted in the biophysical environment as well as social, cultural, and psychological elements (Ardoin 2006). The meaning or qualities people ascribe to places can range from cultural values associated with an area to opportunities tied to the physical environment. When investigating the meaning of a place, questions such as "What does this place mean to me, rather than how much does it mean?" are asked (Stedman 2002: 565). Meanings can be regarded as the cognitive building blocks of attitude (Bem in Stedman 2002). Stedman (2002) argues that we attribute meaning to places which in turn influence how attached we become to a particular place. The meaning people ascribe to places can also differ from person to person due to individuality and differences in attachment. Gustafson (2001) interviewed respondents about places they consider important and what these places meant to them. His analysis of the interviews gave rise to a framework that suggests that ''meanings of place are not forced into three discrete categories but mapped around and between the three poles of self, other and environment'' (Gustafson 2001: 12) (See Figure 2.7). The inclusion of possible relationships between the three poles is crucial in understanding the construct. The seven elements of the three-pole self-other-environment framework are treated seriatim.

(i) *Self.* The first pole 'self', refers to the emotion individuals associate with a place and the extent to which they feel they can identify themselves with a particular place (Gustafson 2001). Schultz (2000) maintains that the extent to which an individual views an object or place as part of herself or himself determines the value attached to it. Individuals who have lived in a place for a long time or have returned to a place might associate the place with rootedness and continuity.

If individuals associate a place with a particular life-stage such as adolescence or parenthood they are likely to associate the place with certain experiences and memories. A place can also be linked to an individual's sense of home and security. Another theme linking self with place is activity. The ability to execute work and leisure activities in a place will influence the meaning of a place.

(ii) *Self-others*. This category represents the relationships between self and other people. Places often become meaningful due to relationships formed between friends, acquaintances and community members (Gustafson 2001). This contributes to a feeling of unity and sense of community. The importance of being recognised and recognising others is highlighted by this category. The opposite of this is anonymity where an individual feels excluded, distant and foreign in one way or another.

(iii) *Others*. Meaning is attributed to places based on the characteristics, traits and behaviours of inhabitants. In this category statements tend to be stereotypical and are often based on comparisons between 'us'/'here' and 'them'/'there' (Gustafson 2001). This is an indication of homogeneity within a community or place of residence.

(iv) *Others-environment*. Gustafson (2001) categorised themes such as the 'atmosphere', the 'climate' and street-life between the others and environment poles. The properties and characteristics of the inhabitants characterise the place. The place then starts to be associated and become known for a certain type of inhabitant.

(v) *Environment*. The pole 'environment' is concerned with the physical environment (both natural and built). Distinctive events and features associated with a place are also important when deriving and assigning meaning to a place. This category includes "symbolic, historical, institutional and geographical" aspects (Gustafson 2001: 11). Politico-demographic and institutional practices associated with a place are also included in this category. Individuals, groups and societies do not necessarily relate to the physical attributes of a place but have a symbolic attachment to a place (Williams et al. 1992). These features cause a place to be identified and labelled as a certain 'type' of place. Places can also be described according to their localisation and their distance from other places. In the process, a distinctive community identity is created.

(vi) *Environment-self*. The relationship between environment and self is based on knowledge of the place. This knowledge can be formal knowledge (geographical and historical) and familiarity with the physical environment. The ability of individuals to perform certain activities and to have

access to certain opportunities is highlighted in this category. Opportunity is often linked to personal development and can be contrasted by a lack of opportunities. These opportunities can influence an individual's place satisfaction which is the utilitarian value of a place to meet basic needs (Stedman 2002). Another relationship between the environment (institutional) and self is citizenship. Citizenship is participation and expressed concerns towards 'others'. Another theme in this category is the localisation of a place where the place is related to an individual (distance and accessibility).

(vii) *Self-others-environment.* Themes such as anonymity and citizenship are involved (not always) in all three poles. Other themes such as traditions, anniversaries and festivals incorporate self, others and the environment. Similarly, when associations and organisations make place meaningful, all three poles contribute to the overall meaning of place. The three-pole self-other-environment framework is illustrated in Figure 2.7.
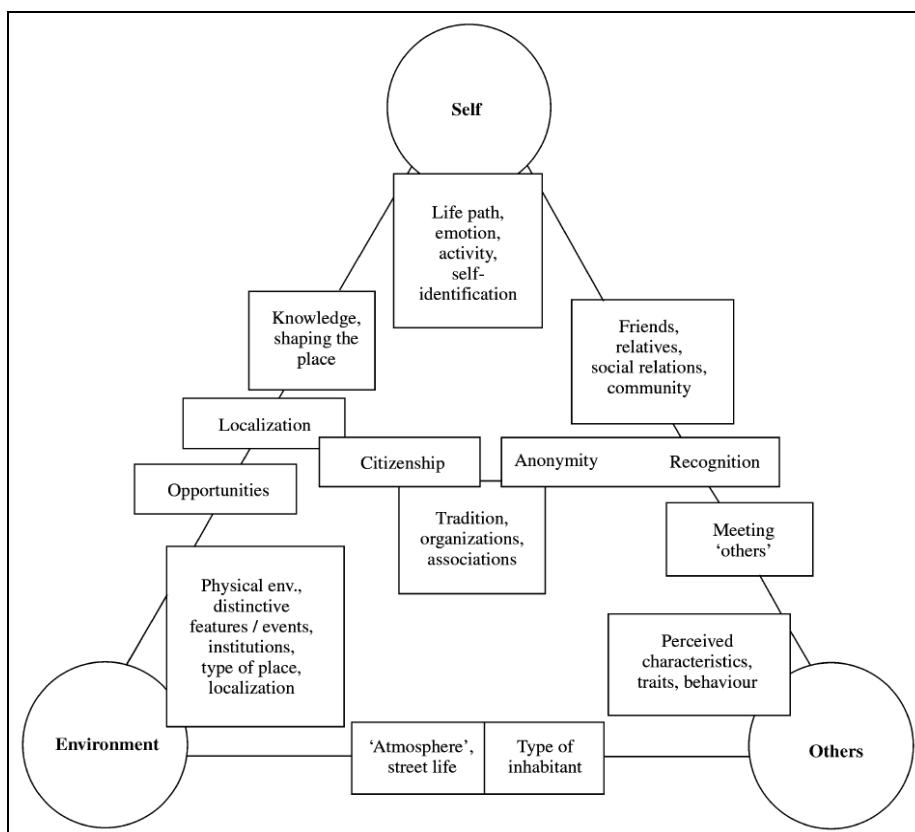


Source: Gustafson (2001: 10)

Figure 2.7 The meaning of places

Gustafson (2001) has pointed out that the model captures the spontaneity and variation in place meaning for different individuals and should not be generalised or quantified. In the next subsection the relationship between place attachment, place meaning and PEB will be investigated.

2.5.3.3 Place attachment and pro-environmental behaviour

"Behavioural approaches…focus on the 'how' and the 'why' of behaviour and on the way in which individuals interpret and assign meaning to the environment" (Walmsley & Lewis 2014: 1). For this reason, less tangible motivations such as place attachment and connectedness to nature have been incorporated into recent research as important drivers of PEB (Gosling & Williams 2010; Kals, Schumacher & Montada 1999; Ramkissoon, Weiler & Smith 2012; Stedman 2002; Vaske & Kobrin 2001). Place attachment is a vital constituent of PEB-related studies as its organisation (cognitive, affective and behavioural components) is similar to psychological concepts such as attitudes (Scannell & Gifford 2010).

The relationship between place attachment, place meaning and PEB has been explained by various scholars. Gosling & Williams (2010: 299) reason that "a person who feels interconnected with the natural world may have an expanded sense of self that includes other non-human living beings, leading to greater biospheric concerns." A strong place attachment is associated with induced stewardship and environmental concern which lead to environmental protection (Brehm, Eisenhauer & Krannich 2006; Gosling & Williams 2010). Mayer & Frantz (2004) reason that empathy and willingness to help increases with an individual's closeness to nature or place. Kals, Schumacher & Montada (1999) have demonstrated how emotional affinity with nature predicts willingness to undertake simple conservation behaviours such as using public transport and petitioning for environmental behaviour. Research has also shown that attachment to place has physical manifestations such as the guarding against physical and social incivilities (removing litter and fighting crime) as residents maintain the appearance of a place because it is a source of pride and identity (Dallago et al. 2009). Relph (1976) has argued that attachment involves care and concern for a place which implies that a person with a strong attachment will probably oppose environmental degradation. Manzo (2005) submits that strongly attached individuals would be expected to show interest and take action against unwanted forms of change in a place. An individual's place attachment does not only influence views about the environment but also the value associated with natural resource management (Kaltenborn & Williams 2002). Vaske & Kobrin (2001) found that place identity has a positive influence on PEB among the youth aged 14 to 17 who participated in a natural-resources programme.

EE, as an inherently interdisciplinary field, often incorporates the importance of first-hand nature experiences in creating a place-based sense of compassion and connection (Kellert 1997; Pyle 2002). The theory of environmental concern, being a function of environmental behaviour and connectedness, is illustrated in Figure 2.8 as a simple linear process. This theory suggests that environmental concern serves a mediating role between connectedness to nature or place and

PEB (Gosling & Williams 2010). Therefore, PEB increases with connectedness to nature or place through an expanded concern for other things (other than oneself).
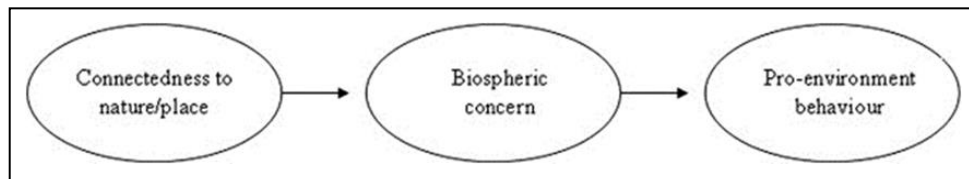
Figure 2.8 The relationship between connectedness with place and pro-environment behaviour

Furthermore, PEB is constructed through the social interaction of people which might foster PEB in different settings (Berthoû 2013; Georg 1999; Nye & Hargreaves 2009). Brandenburg & Carroll (1995) reason that places can facilitate environmental values and meaning that are different from that of people's primary social group. Uzzell, Pol & Badenas (2002: 28) hypothesised that "socially cohesive communities that have a strong sense of social and place identity will be more supportive of environmentally sustainable attitudes and behaviours compared with those communities in which cohesiveness and social and place identities are weaker." But when these scholars compared two neighbourhoods with different environmental quality, they found that those living in environmentally superior neighbourhoods had a stronger place identity but did not show more PEB compared to individuals with a weaker place identity and who live in lower-quality neighbourhoods. Residents of pristine neighbourhoods did not see need to enhance their environments and regarded other issues such as crime as a greater concern in their community.

But, because place attachment is a predictor of intended behaviour rather than actual behaviour, many external factors may hinder intention from being translated into actual behaviour (Fishbein & Ajzen 1975; Halpenny 2006; Stedman 2002). When a behaviour is more difficult or costly (time and money) it may cause an individual's attitude (environmental concern or environmental connectedness) to weaken (Stern 2000). In these cases, association with place and place attachment may be a less apparent and influential factor. Uzzell, Pol & Badenas (2002) argue that place attachment is not a predictor of PEB because individuals tend to identify with environments of good quality. A literature review by Ramkissoon, Weiler & Smith (2012) demonstrates that there is a lack of mature research on place attachment in nature-based settings. Hernández et al. (2010) point out that the high variability in scales used to measure place attachment makes comparisons with other studies difficult.

From the review on place attachment it is evident that the feelings people have toward a place can significantly influence the way they experience, feel about and behave in a place. An individual's feeling toward and association with place or nature can guide their desire to behave pro-environmentally or to resist environmental degradation. Place attachment and place meaning are particularly important in this research because it explains how the attachment of secondary-level schoolchildren of Okahandja influences the environment. The fact that Okahandja has been singled out as one of the 'dirtiest towns' in the country highlights the relevance of investigating the feelings of people in that specific context. In Subsection 2.5.4, personal and situational characteristics that influence a person's environmental reasoning and behaviour are explored.

### 2.5.4   The social basis of environmental concern and behaviour

To understand an individual's behaviour, the direct and indirect influence of personal characteristics (e.g. knowledge and attitudes) and situational characteristics (e.g. social norms and economic constraints) should be investigated (Ajzen & Fishbein 1977; Mainieri et al. 1997). In Hines, Hungerford & Tomera's (1986/87) PEB model, situational factors are placed as the final determinant of PEB because they can counteract or strengthen the other variables. Situational factors refer to economic constraints, social pressures and opportunities (Hines, Hungerford & Tomera 1986/87). Hungerford & Volk (1990) and Van Liere & Dunlap (1981) noted that socio-demographic factors are important as they influence environmental attitudes, environmental concern and environmental behaviour. Kortenkamp & Moore (2001) also report a very strong influence of situational variables on environmental-ethical reasoning. Bradley, Waliczek & Zajicek (1999) agree that external pressures such as socio-economic status and culture should not be excluded when attempting to understand environmental attitudes. This recognises the importance of individual circumstances and external forces that might cause individuals to behave pro-environmentally or not. Even though pro-environmental attitudes do not always translate into protective behaviour, research (Chen et al. 2011; Johnson, Bowker & Cordell 2004; Mainieri et al. 1997; Markowitz et al. 2012; Mertig & Dunlap 2001; Stern, Dietz & Kalof 1993; Xiao & Hong 2010) has identified specific types of people who are more likely to perform PEB. In the following paragraphs gender, age, race, education, national wealth and social class, and place of residence are explained respectively in the context of PEB.

i) *Sex.* Research done from the 1990s has shown that females in the West display higher levels of environmental concern towards local and global issues (Franzen & Meyer 2010; Mainieri et al. 1997; Tindall, Davies & Mauboulès 2003; Zelezny, Chua & Aldrich 2000). Some scholars (Mohai 1992; Stern 1992; Stern & Dietz 1994; Stern, Dietz & Kalof 1993; Zelezny, Chua & Aldrich 2000) have found that females compared to males held more positive environmental

attitudes and are more likely to participate in pro-environmental activities. Hunter, Hatch & Johnson (2004) stress the importance of distinguishing between types of behaviours (household-orientated vs society-orientated) as they found that females were more likely to participate in household-orientated (private) environmental behaviours. Johnson, Bowker & Cordell (2004) found that females scored higher on the NEP scale whereas males were more likely to frequently read environmental material and participate in environmental groups. Males also seem to be more informed about environmental issues compared to females (Diamantopoulos et al. 2003).

Research also suggests that females hold stronger views on environmental protection because they tend to perceive moral dilemmas in terms of interpersonal relationships, so resolving issues by an ethic of care (Zelezny, Chua & Aldrich 2000; Xiao & Hong 2010). They are more expressive causing them to be more nurturing, helpful, cooperative and compassionate (Beutel & Marini 1995; Eagly 1987; Gilligan 1982; Zelezny, Chua & Aldrich 2000; Xiao & Hong 2010). Therefore, females tend to have a more protective and biocentered view towards nature. Males, on the other hand, tend to identify with the role of 'breadwinner' and are more likely to approach moral dilemmas in terms of more impersonal features (Gilligan 1982; Xiao & Hong 2010). Differences in private and public environmental behaviours are often ascribed to gender socialisation as public spheres are often viewed as a masculine domain and private spheres as a more feminine domain (Hunter, Hatch & Johnson 2004; Xiao & McCright 2014).

In contrast to most Western studies, Xiao & Hong (2010) found that Chinese men expressed higher levels of environmental concern. Similarly, Mostafa (2007) found that Egyptian men are generally more environmentally concerned and reported more positive attitudes towards green purchasing. Although these inconsistent empirical findings testify that gender is an unreliable predictor of PEB, the role of gender is nonetheless an influential factor which should not be discarded.

ii) *Age*. Research has found that even though age and environmental concern are only weakly correlated, younger individuals seem to be slightly more likely to engage in PEB (Chen et al. 2011; Hines, Hungerford & Tomera 1986/87; Mertig & Dunlap 2001; Van Liere & Dunlap 1981). This can be attributed to the idealism of youth (Van Liere & Dunlap 1980) and a greater contemporary concern for environmental issues (Kanagy, Humphrey & Firebaugh 1994). But other studies have concluded that even though young people hold more favourable environmental attitudes, they are more reluctant to commit to PEB compared to older people (Diamantopoulos et al. 2003; Grønhøj & Thøgersen 2009; 2012; Johnson, Bowker & Cordell 2004). Wray-Lake, Flanagan & Osgood (2010) disclose a decline in young people's

environmental concern, conservation behaviours and personal responsibility toward environmental protection. Consensus has not been reached yet on the influence of age on PEB.

iii) *Race.* Earlier research has found that White people are more environmentally aware and more likely to perform PEB compared to Black people. For example, Van Arsdol, Sabagh & Alexander (1964) found that non-White residents of Los Angeles were less likely to recognise environmental hazards such as traffic noise and smog. People living in polluted conditions may grow accustomed to the conditions so reducing their environmental awareness (Mohai & Bryant 1998). Because upper-middle-class Whites tend to live in clean and aesthetic environments they are more concerned about environmental deterioration. Kreger (1973) reported that Black students in America seem to regard environmental problems as less important than other survival issues. The respondents reasoned that polluted environments are customary problems of ghetto life. More recently, Caron's (1989) findings differ from those of the earlier studies that contended that Blacks are less environmentally concerned. He found that Blacks do not hold negative views on environmental protection and that they are steering away from the tenets of the dominant social paradigm. Similarly, Whittaker, Segura & Bowler (2005) found that Latinos and African-Americans, who are among the least-educated and poorest members of society in the USA are equally concerned about environmental problems as White, non-Hispanics. These differences in findings are explicable. First, most studies have focused on specific environmental issues such as pollution whereas Caron (1989) examined Blacks' endorsement of the new environmental paradigm. Second, Blacks are more likely to evaluate environmental issues relative to other problems they face such as poverty and discrimination. Third, a shift in environmental protection from protecting wilderness in the 1970s to more recent health threats tied to pollution cause Black Americans to be aware of environmental issues from a new perspective. Furthermore, regarding the USA Jones & Carter (1994: 574) aver that "whites have been more likely to be members of environmental organisations and to give more of their time and money to support the agendas of environmental groups than blacks or minority group members." Johnson, Bowker & Cordell (2004) argue that environmental studies should move beyond the dichotomy of Black versus White environmental behaviour to also investigate the differences in environmental beliefs and behaviour held by different ethnic segments of the population.

iv) *Education.* People who have attained higher levels of education seem to be more likely to behave in a pro-environmental fashion compared to those with lower levels of education (Cottrell 2003; Mertig & Dunlap 2001; Van Liere & Dunlap 1981; Vicente-Molina, Fernández-Sáinz & Izagirre-Olaizola 2013; Xiao & Hong 2010). The relationship between education and

PEB is explained by Maloney & Ward (1973: 585) as: ''…the very nature of ecology with its complex interactions between organisms and environment serves to make its subject matter difficult to understand and assimilate." Johnson, Bowker & Cordell (2004) found that level of post-secondary education did not influence NEP scores but it was a strong predictor of environmental behaviours. Yet Uyeki & Holland (2000) found that less-educated and lower-income groups were more supportive of environmental and animal rights.

v) *National wealth and social class*. It was long believed that environmental concern and support were limited to highly industrialised, wealthy and primarily northern-hemisphere nations (Dunlap & York 2008). Guha & Martinez-Alier (2013) refer to the 'full stomach' environmentalism of the North and the 'empty-belly' environmentalism of the South. With the growth of environmental activism in poor nations and the participation of these nations in the Global Forum in Rio de Janeiro 1992, doubts were raised about the assumed absence of environmental concern and awareness in poor nations (Brechin & Kempton 1994; Dunlap & York 2008; Fisher 1993). Wilfred Beckerman, a conservative economist, explained this as follows: "Poor people will naturally have a greater incentive to give priority to more goods and services than to the environment in general. In the same way, poor countries…would be foolish to make heavy sacrifices of economic progress in the interests even of their own environment, let alone that of the world in general" (Beckerman 1974: 89). One of the reasons why Lawrence Summers, a chief economist in the World Bank, suggested that 'dirty industries' should be migrated to less developed countries is because there is a lower demand for a clean environment among poor people because such demand has "high income elasticity" (Guha & Martinez-Alier 1997: 38). According to Franzen (2003: 299), "Citizens in wealthier nations not only have a higher demand for a clean environment, but they also have less pressing economic problems and are therefore more willing and able to reduce their standard of living in order to devote more resources to global environmental protection."

Van Liere & Dunlap (1980) put forward 'the social class hypothesis' which proposes that environmental concern is a function of education, occupational prestige and income. The supposition explains that individuals from upper and middle classes are more likely to be associated with environmental concerns because their basic material needs (shelter, food and security) have been met and consequently they are more likely to focus on aesthetic aspects. This is congruent with mainstream reasoning that environmental amenities are considered 'luxury goods' to those whose basic needs are already met (Baumol & Oates 1979). Inglehart's (1990) reasoning about materialism and post-materialism is based on Maslow's theory that people tend to give priority to their safety and sustenance needs (Dunlap & York 2008; Knight & Messer

2012). A Maslowian shift in values causes people previously concerned about survival (materialistic) to became concerned about quality of life (post-materialistic) (Knight & Messer 2012). According to Inglehart (1990) poor people cannot afford to endorse environmental quality because it is a high-order, quality-of-life value. The prevalence of post-materialist values in rich nations causes them to express higher levels of environmental concern compared to poor nations (Brechin 1999; Brechin & Kempton 1997; Dunlap & Mertig 1997). PEB is associated with benefits and costs and when the benefits are compared to the costs involved the story takes a different turn (Thøgersen in Uyeki & Holland 2000). Fahlquist (2009) maintains that it cannot be expected of individuals to behave pro-environmentally unless they have reasonable alternatives and resources and that environmental responsibility should be ascribed to governments and corporations. However, situational factors such as low socio-economic status may also increase the incidence of PEB as an individual may curb energy consumption for economic reasons (to save money) although he/she might not have a deep-seated desire to conserve fossil fuels (Hines, Hungerford & Tomera 1986/87).

Thinking regarding environmental concern changed when the 'Health of the planet' survey revealed that poor nations did express concern about the environment (Dunlap & York 2008). Overall, the results showed that environmental concern is a global phenomenon and not limited to wealthy nations. It is clear that poor and rich nations are concerned for different reasons. Whereas poor nations are often materialistic and concerned about threats to health, the post-materialistic views of richer nations cause them to regard aesthetic issues such as nature preservation as important. Because livelihoods in poor nations are often dependent on the availability of natural resources this can be used by policy-makers to guide and encourage protection of resources (Dunlap & York 2008).

vi) *Urban vs rural residents.* Generally, urban residents have been found to display greater levels of environmental concern and are more likely to demonstrate PEB than rural residents (Ambrosius & Gilderbloom 2015; Arcury & Christianson 1990; Berenguer, Corraliza & Martín 2005; Mohai & Twight 1987; Sharp & Adua 2009). This is often attributed to rural residents tending to live in undisturbed areas that have not been modified by human activity and the economy of these rural areas is supported by resource exploitation such as mining. Urban residents, on the other hand, are frequently exposed to various types of environmental issues such as air pollution, overcrowding and land degradation. Compared to those living in rural areas, urbanites are less likely to read environmental material or to participate in nature-based activities (Johnson, Bowker & Cordell 2004). Urbanites are, however, more likely to recycle (Johnson, Bowker & Cordell 2004). This can be ascribed to more structured opportunities for

PEB, such as recycling, in urban areas (Derksen & Gartrell 1993). Recent research suggests that the differences between the environmental concern of rural and urban residents might be diminishing (Huddart-Kennedy et al. 2009). This can be due to the migration of urbanites to rural areas (Smith & Krannich 2000), improved environmental facilities and services in rural areas (Derkson & Gartrell 1993; Saphores et al. 2006) and the decline of economic dependency on natural resources in rural communities (Jones et al. 2003).

The expositions in Subsection 2.5.4 confirm that socio-economic and demographic factors add complexity to the understanding of PEB. The uniqueness of population groups and individuals in different contexts can significantly influence their environmental attitudes and behaviour. Also, an individual might act in a pro-environmental manner because the incentive (recycling and saving electricity) attached to the specific behaviour might be greater than the individual's desire to conserve and protect. More than 35 years ago Van Liere & Dunlap (1980) suggested that greater attention must be given to the demographic determinants that influence environmental reasoning. These socio-economic and demographic factors are deemed as fundamental in the context of Okahandja because the study deals with a town of high unemployment, mainly Black residents and people who use the natural environment to sustain themselves.

From the discussion in Section 2.5 it is clear that numerous EBFs exists and that the impact of these factors differ across contexts and ethnic groups. First, environmental worldview is considered important in this research because it provides information on the stance people take when considering the environment. Second, environmental knowledge is incorporated as necessity to environmental awareness and PEB. Third, place attachment is identified as a vital constituent in understanding environmental behaviour in Okahandja because of the context specificity of environmental problems. And last, the socio-economic and demographic profiles of the schoolchildren draw attention to the importance of personal and situational characteristics in PEB.

Section 2.6 continues the discussion on PEB and the materialising thereof.

## 2.6    THE REALISATION OF PRO-ENVIRONMENTAL BEHAVIOUR (PEB)

Grob (1995) has pronounced that the most important predictors of PEB are open or creative thinking and post-materialistic value orientations. So raising the crucial question how to foster such thinking in people. Grob (1995) issued the challenge that in future preventative programmes the key question would be quite likely be whether and how openness and flexibility are learned. Recently, Steg et al. (2014) have asserted that people engage in PEB for three

reasons: hedonic goals, gain goals, and normative goals. Hedonic goals refer to the improvement of an individual's feelings in a situation such as avoiding effort or seeking enjoyment. Gain goals cause people to be sensitive to changes in their resource base, such as money. Normative goals make individuals believe that what they do makes a contribution to the environment and that it is the 'right thing to do'.

To bridge the gap between PEB and factors constraining it, Kaplan (2000) suggests that community members should be involved in active engagement of problem solving to give them the chance to find innovative solutions to environmental issues without compromising their own needs. Participants must be allowed to figure out solutions and opportunities for themselves rather than telling them what to do which can lead to disinterest or feelings of helplessness. In the process of finding and proposing solutions, participants can discover that PEB does not necessarily involve activities or sacrifices that will decrease their quality of life as often framed in PEB initiatives (Kaplan 2000). It is equally important to construct the appropriate behaviour routines for people of different backgrounds to avoid discouragement or demotivation of these behaviours. Mosler (1993) advocates two conditions that should be met to ensure self-organised and collective behaviour. First, despite individual preferences, individuals should select PEB above any other behaviour. Second, PEB should serve as an influential agent among individuals, encouraging others to show similar behaviour. PEB can only be rewarding and effective if individuals collectively decide to partake in appropriate behaviour to ensure transformation. For example, a person starts carpooling over an extended period and introduces other conservational behaviour such as saving energy. Another way is to influence the hedonic goals, gain goals, and normative goals of an individual (Steg et al. 2014). It is noteworthy that PEB often causes conflict between normative goals on the one hand and hedonic and gain goals on the other hand (Lindenberg & Steg 2007; Nordlund & Garvill 2003; Steg et al. 2014). While PEB may be considered the appropriate thing to do, it is often less profitable, less pleasurable and more time consuming compared to environmentally-harmful behaviour (Steg et al. 2014). But Steg et al. (2014) contend that when normative goals are strengthened, individuals will behave responsibly even if the behaviour is costly or requires great effort.

Maio et al. (2007: 100) insist that "changing the behaviors entails changing the context of the behavior and the individual's role in producing the behaviour." As discussed in the previous sections, behaviour is evidently influenced by individual and external environments (Mair & Laing 2013). Most PEB studies (e.g. Corral-Verdugo & Figueredo 1999; Dono, Webb & Richardson 2010; Hedlund 2011; Homburg & Stolberg 2006) have been based on self-reported behaviour or verbal commitment to PEB, making the validity questionable. People tend to feel

marginally inclined to give socially-desirable answers (Schahn et al. in Halpenny 2010). PEB is inherently highly variant so that it cannot be assumed that if an individual engages in one type of PEB he/she would engage in other PEBs (Mainieri et al. 1997). These complexities not only demand the identification of internal and external factors that influence behaviour but also the investigation of different environmental behaviours in different populations.

From Section 2.5 and Section 2.6 it is evident that the environmental behavioural responses of people are a function of a combination of complex factors and influences hence the title of the chapter. Hines, Hungerford & Tomera's (1986/87) suggestion that researchers should understand environmental behaviour as a system of interrelationships rather than isolating individual factors is still relevant today. Section 2.7 changes the direction of the review towards environmental education as a way to mitigate environmental degradation and to change environmental behaviour.

## 2.7    MITIGATING ENVIRONMENTAL PROBLEMS THROUGH ENVIRONMENTAL EDUCATION

Since the goal of education is to shape human behaviour, educational institutions aim to produce responsible citizens that behave in desirable ways (Hungerford & Volk 1990). Ignatow (2006) has taken the stance of Durkheim (1956) by arguing that education is a powerful mechanism through which the values and attitudes of citizens and communities can be transformed. As in other forms of education, EE aims to achieve these specific fundamental goals: to inform, create awareness, train and to reap responsible citizens (Carleton-Hug & Hug 2010; Eilam & Trop 2012; Hungerford & Volk 1990; Trewhella et al. 2005; Vaughan et al. 2003). He et al. (2011: 94) probe the outcomes and efficiency of EE by asking the following questions: "Does the EE curriculum provide enough knowledge and practical skills to effectively achieve its goal? Is it always implemented effectively and evenly? Is environmental attitude and behavior ultimately affected positively by EE?"

Stevenson (2007) claims that EE originated from the promotion of nature and outdoor studies in primary schools following by the conservation movement. Nature study gained prominence through rural studies in Britain (Wheeler 1975), Australia's school camps movement (Strom in Stevenson 2007) and Wilbur Jackman's publication on nature study for the common schools in the USA in 1891 (Stapp 1974). While nature study was and still is focused on developing an understanding of the natural environment, the conservation movement grew gradually during the early nineteenth century, introducing a concern for species preservation and sound management

(Stevenson 2007). Rachel Carson's 1962 *Silent spring* and Steward Udall's 1963 *Quiet crisis* are two landmark books that brought environmental problems to the attention of Americans during the early 1960s. Carson reported on concern about the use of chemical pesticides to control insect populations and weeds after it became evident that they had deleterious effects far beyond the intended pest control and Udall wrote about the dangers of pollution and the overuse of natural resources (Carter & Simmons 2010). In 1977, the first intergovernmental conference on EE was held by UNESCO at Tbilisi, Georgia in the USSR (Bornman 1997). Even today, research done in the field of EE is still often based on the fundamentals propounded in the publications of the Tbilisi conference.

Due to the complexity and ever-changing nature of EE's objectives, scholars warn against the oversimplifying of a definition for EE. According to Le Grange (2002) is it not only the definition of EE that is changing but also its key principles. While the principles formulated at the Tbilisi Conference take an almost value-neutral stance, the principles of the 1992 UNCED NGO Conference (Rio de Janeiro) regard EE as more value-based and linked to social transformation. In the Thessaloniki Declaration produced at the 1997 International Conference on Environment and Society: Education and Public Awareness for Sustainability, EE was replaced with education for environment and sustainability. The relationship and tensions between EE and education for sustainable development are evident in a growing body of literature (Kopnina 2012; Wesselink & Wals 2011). Some scholars argue that EE will not be replaced by education for sustainable development, rather that EE is a goal of education for sustainable development (McKeown & Hopkins 2003) and that EE has become education for sustainable development (Ärlemalm-Hagsér & Sandberg 2011; Eilam & Trop 2010). Knapp (2000) expresses his concern for the field being consumed by more politically-correct movements and argues that the spirit of EE that began at Tbilisi should be defended.

Yet it remains essential to gain an understanding of what EE entails and an appreciation of the importance of the intended objectives of EE to environmental protection. Stapp (1969: 30) formulated one of the first definitions for EE, namely "environmental education is aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to solve these problems and motivated to work toward their solution." EE seeks to foster the necessary skills and attitudes in individuals and communities so that there is an understanding and appreciation for the interrelatedness among humans, their cultures and their biophysical surroundings (Palmer 1998a). Knapp (2000: 34) contends that the ultimate goal of EE is to "produce an environmentally literate and responsible citizen, one who can make decisions that will help check many of the environmental problems that will arise in

the 21st century." As a medium EE also attempts to develop ecological and environmental knowledge, promote skills needed to participate in ecological conservation, foster relationships between people and the outdoors and to encourage pro-environmental attitudes and behaviours (Carleton-Hug & Hug 2010; Chawla & Cushing 2007; Dale & Newman 2005; Hungerford & Volk 1990; Rickinson 2001; Volk & McBeth 1998). These standpoints support the original aim of the 1977 Tbilisi Conference on EE:

> ….to succeed in making individuals and communities understand the complex nature of the natural and the built environments resulting from the interaction of their biological, physical, social economic and cultural aspects, and acquire the knowledge, values, attitudes and practical skills to participate in a responsible and effective way in anticipating and solving environmental problems, and the management of the quality of environments (UNESCO 1978: 25).

Against this background it can be said that EE is a lifelong learning process has various operational purposes, namely to produce a world population that is concerned about the environment and possesses the knowledge, skills and motivation to solve current problems (UNESCO 1975);  to cultivate and instil a positive environmental worldview (Kassas 2002); and to create an environmentally responsible population by fostering environmental citizenship components (information, attitude, beliefs and knowledge) (Hawthorne & Alabaster 1999). For these reasons EE is often viewed as the vehicle that ensures a sustainable future for present and future generations (Kola-Olusanya 2005; Vaughan et al. 2003).

Scholars have proposed different ways how the role of EE can be strengthened. Hines, Hungerford & Tomera (1986/87) have advocated that even though environmental behaviour cannot be enforced, educators can instil environmental knowledge and problem-solving skills in those they are educating, and they can take a different approach such as empowering learners and teaching them to take ownership of their lives and surroundings. Pe'er, Goldman & Yavetz (2007) agree that environmental literacy's focal purpose should be to empower people with a belief that they have the ability to contribute to environmental solutions through personal behaviour. Saylan & Blumstein (2007) have reasoned that critical thinking should be taught which will enable environmentally-aware citizens to ask questions and evaluate their own actions. Such submissions are often incorporated into the literature on environmental citizenship. Berkowitz, Ford & Brewer (2005) have illustrate environmental citizenship as the overall goal of EE (Figure 2.9). They further propose an integrating framework for EE consisting of five components: ecological literacy, civics literacy, values awareness, self-efficacy and practical wisdom (Table 2.2). They emphasise the importance of understanding the framework as an

interrelated and highly overlapping system with various entry points and no simple or hierarchical sequence.
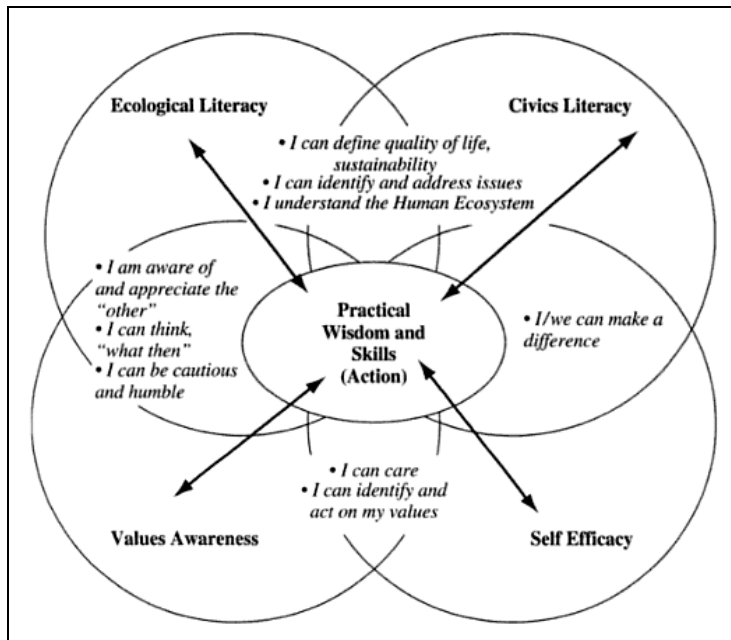


Source: Berkowitz, Ford & Brewer (2005: 230)

Figure 2.9 Diagram of the components of environmental citizenship

The various components of environmental citizenship are briefly explained in Table 2.2.

Table 2.2 Description of the components of environmental citizenship

| Component | Description |
|---|---|
| **Ecological literacy** | Understanding the physical, biological and social systems in one's immediate environment; understanding how these systems interact and how people living there are affected; have a level of familiarity with unique organisms and biological communities in the immediate environment; and understand how one is connected with the local environment, including the development of sense of place. |
| **Civics literacy** | The ability to understand social systems and to use the understanding to behave in the interest of society and fulfilling one's social responsibility. |
| **Value awareness** | Developing an awareness on the consequences of one's values on society and the physical environment; valuing the environment as a crucial consideration when deciding how to act; and recognising that humanity's well-being and health are directly linked to the living and physical world around us. |
| **Self-efficacy** | The development of self-confidence and the ability to understand and apply one's values, knowledge and skills. |
| **Practical wisdom and skills** | It is required that an individual possesses practical wisdom and skills to be able to use knowledge, self-awareness and self-confidence for action. This component is placed at the centre of the framework to illustrate that education revolves around it and is an interactive process between the other components. |

Source: Adapted from Berkowitz, Ford & Brewer (2005)

It must be stressed that the methodological and pedagogical approaches to EE differ according to the targeted audience, for example at university level the focus is placed on both training and

human development while education for awareness and public participation requires programmes for the media (Kassas 2002). EE is also implemented at parks, schools, zoos, non-formal learning centres, museums and camps to help audiences gain a greater understanding of the environment and their personal responsibility for addressing environmental problems (Carleton-Hug & Hug 2010). In Canada, for example, an integrated environmental programme referred to as the Environmental Studies Programs has been implemented in secondary schools to link school-subject matter with personal responsibility (Breunig et al. 2014). EE is also often integrated into the school curriculum, school management and school policy as a cross-curricular theme. Bornman (1997: 60) makes reference to Agenda 21, Earth Summit 1992 and Tilbury (1993; 1995) to explain EE as a cross-curricular theme:

> Learning *about* the environment aids the acquisition of knowledge and understanding, helping the development of sensitivity and awareness for the environment on a local, national and global basis. Learning *through* and *in* the environment leads to the development of skills which help in problem tackling and decision making. Learning *for* the environment deals with the development of attitudes and values which promote responsibility for the environment and encourage direct involvement in environmental action.

Hungerford & Volk (1990) argue that inculcating responsible citizenship in children is hindered by EE's inability to deliver desired outcomes and the fact that EE is neglected in the curriculum. Knapp (2000) agrees and points out that that EE should be promoted to a subject in formal education and not remain scattered in the curriculum. Squeezing EE curricula into the existing school curricula assumes that "one size fits all" which is not the case (Strife 2010: 188). Furthermore, educational programmes typically focus on cognitive learning outcomes, neglecting intention-based or behaviour-based outcomes (Heimlich 2010; Volk & McBeth 1998). The fruitlessness of many EE programmes can also be ascribed to people's sensitivity to their surroundings due to a combination of factors such as childhood experiences, pro-environmental values held by the family, education and role models (teachers or friends) (Chawla 1998). The challenge is this research is to establish an approach that would effectively bridge the gap between environmental knowledge acquisition (and schooling) and PEB. While it may not be possible (financially and logistically) to promote EE to a subject in formal education, teachers must be held responsible to foster PEB values in the hearts of children through the carrier subjects of EE in the Namibian school curricula as outlined in Section 1.4.

## 2.8    CONCLUSION

In this chapter, literature on environmental behaviour has been reviewed, starting with an overview of what the term environment entails. Thereafter a review of models revealed that PEB is a combination of highly varied, complex and liquid factors and processes. The importance of

recognising contextual differences between communities when investigating environmental behaviour was emphasised. Although the literature points to environmental concern varying across different socio-economic and demographic categories, young educated upper-class females from urban contexts are most likely to display environmentally-supportive attitudes and behaviours. The uniqueness of different communities and populations poses challenges to researchers as the application of generic models and research methods are not always possible. This often produces varied and contradictory results and findings in the field of environmental behaviour. The reviewed literature also makes it clear that PEB is a function of pro-social motives, self-interest and morals. The relationship of ethnic groups in relation to PEB in Africa, and more specifically in Namibia, are undocumented. Compared to the many non-African applications, EBFs have not been investigated and tested thoroughly in African countries. For this particular reason, this study attempts to fill the vacuum by shedding light on the environmental reasoning of secondary-level schoolchildren of Okahandja, Namibia.

The next chapter shifts the attention to the methodological stance taken and the methods employed in this study.

# CHAPTER 3 METHODOLOGY: TURNING METHOD INTO ART

## 3.1 INTRODUCTION

Humankind is faced with global environmental challenges such as resource depletion, climate change and biodiversity loss. Interdisciplinary and international efforts have been made to counteract these challenges. These endeavours have aimed to "understand the key drivers and processes behind behaviour causing these challenges, predicting their development over time and eventually changing the system enough to mitigate negative outcomes are essential" (Klöckner 2013: 5). Stern, Young & Druckman (1991) recommended that an interdisciplinary research approach should be followed to investigate the linkage(s) between an individual's attitudes and values and the environmental concern he or she possesses or expresses. The methods selected for this study were drawn from different disciplines in the appropriate international literature. The research used a mixed-method approach to examine the environmental beliefs and the environmental reasoning of secondary-level schoolchildren and to unravel some of the complexity encountered in understanding and changing environmental behaviour. The chapter describes the mixed-methods approach and the construction of research instruments used to realise the research objectives.

## 3.2 METHODOLOGY

This study has mostly utilised a realism mixed methodological approach. An explanation of the realism paradigm by Perry, Alizadeh & Riege (1997) is shown in Table 3.1. In the realism paradigm, a reality exists independently of the researcher's mind and people's perceptions are a window on to the external reality. According to Pawson & Tilley (1997: 152) realism research develops a "family of answers." Realism research consistently asks why a result has been found because the findings are mere "outcroppings" of a deeper and unobservable reality (Neuman 1994: 423).

Table 3.1 Realism as paradigm

| Paradigm | Realism |
|---|---|
| Ontology | Reality is "real" but only imperfectly and probabilistically apprehensible and so triangulation from many sources is required to try to know it. |
| Epistemology | Findings probably true – researcher is value-aware and needs to triangulate any perceptions he or she is collecting. |
| Methodology | Case studies/convergent interviewing: triangulation, interpretation of research issues by qualitative and quantitative methods. |

Source: Adapted from Perry, Alizadeh & Riege (1997)

This research was a case study following a descriptive approach to determine why young people in a certain community act in a specific manner in their local environmental context. According to Eisenhardt (1989: 534) a case study is a "research strategy which focuses on understanding the dynamics present within single settings." Moreover, case studies aim to produce in-depth interpretations and descriptions to focused themes and questions (Hays 2003). Creswell (2013: 496) recommends the use of case study if the problem to be studied "relates to developing an in-depth understanding of a 'case' or bounded system" and if the purpose is to understand "an event, activity, process, or one or more individuals." Bounded means that the case is singled out for research regarding time, place, or some physical boundaries. In this study, the town of Okahandja was selected as research setting to be investigated.

To obtain an in-depth understanding of the complicated cause-and-effect relationships within the context of Okahandja, a combination of quantitative and qualitative methods was implemented. Quantitative research typically tests hypotheses or theories whereas qualitative research is more explorative in nature often leading to the development of hypotheses and theories (Punch 2005). Quantitative research answers questions such as "how often" and "how many" while qualitative research typically addresses questions such as "how" and "why" (Malina, Nørreklit & Selto 2011). Even though these two approaches represent different ends of a continuum, they should not be viewed as separate entities because their integration (mixed methodology) is possible (Blaxter 2010; Newman & Benz 1998). Johnson, Onwuegbuzie & Turner (2007: 121) have cited mixed methods research as:

> Mixed methods research refers to the use of data collection methods that collect both quantitative and qualitative data. Mixed methods research acknowledges that all methods have inherent biases and weaknesses; that using a mixed method approach increases the likelihood that the sum of the data collected will be richer, more meaningful, and ultimately more useful in answering the research questions.

Mixed-methods research is routinely used to investigate and to better understand the complexity of social phenomena (Greene 2007; Malina, Nørreklit & Selto 2011). Mixed-methods research does not only further the understanding of complex problems but also produces meaningful results for larger audiences such as the participants themselves and local stakeholders (Sydenstricker-Neto in Greene 2007). Mixed-methods research enables the use of words, pictures and narrative to add meaning to numbers. Whereas a single inquiry can cause one-sided views, a combination of methods helps to develop an understanding of the depth, completeness or elaboration of the identified problem (Schutz, Chambless & DeCuir 2003). The integration of multiple research methods enhances the creative potential of the study and builds confidence in

the findings (Eisenhardt 1989). By mixing quantitative and qualitative techniques in a form of triangulation, the strengths and weaknesses of each technique are balanced (Abowitz & Toole 2009; Johnson & Onwuegbuzie 2004; Östlund et al. 2011). If a lack of corroboration exists between methods, it provides opportunity to think about problems in different and renewed ways (Schutz, Chambless & DeCuir 2003).

However, mixed-methods research is prone to hindering thorough resistance to it by qualitative and quantitative purists although mixed-methods research should be seen to transcend paradigm wars (Creswell & Plano Clark 2010; Felizer 2010; Harrits 2011; Teddlie & Tashakkori 2009). To its credit, a mixed-methods approach requires skills and knowledge in selected (different disciplines) fields of inquiry so increasing the time spent and workload involved in the construction of appropriate research and analysis instruments but these help to strengthen balanced findings and conclusions. The writing-up of the mixed-methods procedures and results is often time consuming and laborious as researchers must make sense of large volumes of data (Schutz, Chambless & DeCuir 2003).

This research used mixed methods by combining quantitative and qualitative methods. Different methods have different purposes therefore, the variety of methods employed aimed to complement different stages of the research process. Different methods were implemented during different stages of the research as each served a purpose in data collection, analysis and reporting of results. A sequential mixed methods explanatory design similar to that of Buck et al. (2009: 392) was followed "to use qualitative results to assist in explaining and interpreting quantitative findings." In sequential mixed methods research, one approach informs the next (Östlund et al. 2011). This research gives precedence to a quantitative approach with qualitative approaches playing secondary and complementary roles. The explanatory sequential design of this research is illustrated in Figure 3.1. In stage one, the questionnaire data was collected and analysed. In stage two, the results of the questionnaire were recorded. In stage three, subquestions for the focus group discussions were compiled from the results of the questionnaire. Also, specific focus group participants were selected from the questionnaire. In this case, a quantitative method enabled the selection of a qualitative subsample from the population and ensured the representiveness of the sample. Furthermore, the subquestions assisted in clarifying or elaborating on the overall quantitative research. In stage four, focus group data was collected and analysed whereas in stage five, the results of the focus groups were recorded. In the last stage, it was interpreted how the focus group results explain the questionnaire results. By using the results of the focus groups to understand the results of the questionnaire, a better understanding was gained on ambiguous and confusing responses. By employing an explanatory

sequential design, the researcher gained in-depth insights into the environmental reasoning of the schoolchildren.
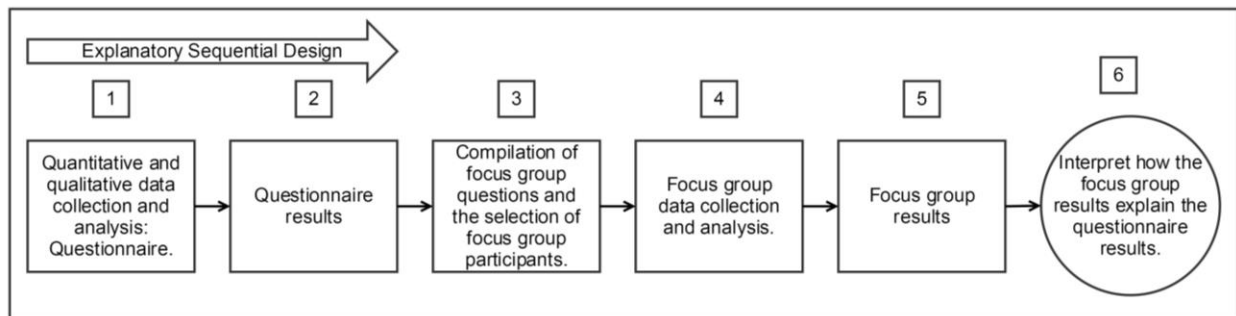
Figure 3.1 The components of explanatory sequential design

In the following section the quantitative and qualitative methods used are discussed.

### 3.3 DATA COLLECTION

As mentioned above and in Section 1.8, this research made use of various data collection methods. These methods are observations, a questionnaire survey, participatory drawing and focus group discussions.

### 3.3.1   Observation as tool for ground truthing

Observation is a "purposeful, systematic and selective way of watching and listening to an interaction or phenomenon as it takes place" (Kumar 1999: 105). Ritchie (2003) commends observation as the opportunity to record and analyse interactions and for the researcher to 'see' actions, events and experiences from his/her own perspective. Furthermore, "observation provides a direct and powerful way of learning about people's behaviour and the context in which it occurs" (Maxwell 2013: 103).

In this case study transect walks through the communities were used to directly observe and familiarise the researcher with the real-world contexts under investigation. Holloway & Roomaney (2008: 76) define a transect walk as the "careful observation on foot to cross-check or 'ground-truth'." Taplin, Scheld & Low (2002: 87) highlight that "…sights, sounds, and smells of being on-site provide a continual stimulus to the memory." Transect walks are useful and cost-effective tools to address rural issues effectively (Van Staden et al. 2006). According to Mahiri (1998) a transect walk in participatory rural appraisal is normally conducted by a mixed group of local people and professionals. The advantages of this qualitative method are that it enables researchers to familiarise themselves with the community, for people to share knowledge of their local environment and for residents and community leaders to exchange views with the

researcher on environmental issues (Van Staden et al. 2006). The downside of this method is that it might raise expectations among community members and walking unaccompanied might be unsafe.

The transect walks were undertaken mainly to gain insights into the schoolchildren's real world living contexts, way of living, their interaction with their environment, potential environmental problems and if any environmental action had been taken to resolve identified issues. Observations were also made to obtain insights into and become informed about the study area as documented information on Okahandja is limited. Preparation for the transect walks involved the compilation of a checklist of key features to be observed. The following observations were made during each walk:

1. Identify community types (e.g. informal settlement).
2. Determine conditions of roads, local buildings and houses.
3. Identify sources (and accessibility) of water.
4. Establish sanitation conditions (sewage, garbage and contaminated spaces).
5. Identify sources of pollution.
6. Identify fuel types (energy sources) used.
7. Determine the condition (and availability) of vegetable gardens and livestock.

Due to the size of the residential areas and their geographical proximity, the observations were done in phases. Observations were made in Vyf Rand Camp, Oshetu, Nau-Aib, Veddersdal, Smarties and Central Okahandja in April 2014 and May 2015. Unlike normal practice of walks following predetermined paths, the Okahandja walks were made along most of the streets and in the open spaces in and around the residential areas. The transect walks followed a zigzag course (between streets and houses) to ensure optimal coverage and opportunity to observe key elements. The walks took 3 to 4 hours through each residential area. During the walks the researcher also engaged with community members to clarify or confirm certain observations. In Vyf Rand Camp, three schoolchildren accompanied the researcher during the walk to aid in getting some context of the residential area, explaining hardships they encounter and giving an indication of the way people live in the residential area. Observations were also made on the school premises. The observations were recorded in the researcher's field notes and photographs were taken.

**3.3.2    The questionnaire**

Collecting data by means of a questionnaire is a widely used and well-known method. It is a suitable strategy for obtaining answers by questioning (Blaxter 2010). Information gathered from questionnaires is used for descriptive purposes and to investigate relationships between factors. Questionnaires are a very popular means of obtaining environmental views of large groups of people. Tuncer et al. (2005) developed a 45-item environmental attitude questionnaire (EAQ) to investigate the environmental attitudes of nearly 1500 school (private and public) children in Ankara, Turkey. Kaiser et al. (1999) explored the environmental knowledge, values, intended behaviour and responsibility of 445 members from two Swiss transportation associations. Cottrell (2003) constructed a questionnaire based on items (PEB, verbal commitment, environmental concern) from previous research (e.g. Dunlap & Van Liere 1978; Maloney, Ward & Braucht 1975).

 In this case study of Okahandja a questionnaire was used as a quantitative and qualitative research instrument. The questionnaire was structured in five sections to elicit information from secondary-level schoolchildren about their environmental knowledge (6 questions); place attachment (8 questions); environmental concern (11 questions); environmental behaviour (7 questions); and biographical details (16 questions). The following paragraphs explain the aim of each section of the questionnaire. The questionnaire is appended as Appendix A.

3.3.2.1 Description of sections

*Environmental knowledge and awareness.* The section on environmental knowledge was divided into two groups. The first dealt with general environmental knowledge, namely how well the participants could recall specific environmental facts. The four questions (A1 to A4) were relatively broad and basic to enable comparisons between grade levels. Questions covered aspects such as soil erosion and the burning of fossil fuels and required participants to indicate if statements were true, false or if they are unsure. The second group of questions (A5 and A6) enquired after environmental awareness to determine if participants were aware of the importance of Okahandja being a clean town (an open-ended question) and who their main informant was regarding the conservation of the natural environment.

*Place attachment.* In section B participants' place attachment to Okahandja was measured by asking six questions on place attachment along the lines developed by Daniel R Williams and colleagues (Williams & Roggenbuck 1989; Williams et al. 1995; 1992). Respondents indicated their agreement with six statements on a five-point Likert scale (strongly disagree to strongly

agree). Further, participants were asked to identify or describe characteristics of Okahandja that made them proud (B7) and ashamed (B8). These last two questions were open-ended.

*Environmental concern.* The section on environmental concern was divided into two groups, namely general environmental concern (C1 to C6) and environmental worldview (C7 to C11). The first six questions were based on Worsley & Skrzypiec (1998) to gain a holistic perspective on participants' environmental concern for aspects such as pollution, natural resource protection and conservation. The remaining five questions dealing with environmental worldview used NEP scale items (Dunlap & Van Liere 1978; Manoli, Johnson & Dunlap 2007) as measure. The worldview questions were intended to obtain an understanding of the respondents' perceptions of the natural environment. All the answers were scored on the five-point Likert scale.

*Environmental behaviour.* In section D participants' environmental behaviour was queried through five closed-ended and two open-ended questions. All the questions in this section were specifically formulated by the researcher to incorporate the 'real-world local context' and to measure self-reported behaviour and verbal commitment relating to the study area. Simple and everyday PEB such as cleaning up, saving energy and minimising water wastage were used rather than expensive and time-consuming behaviours such as recycling and support of environmental campaigns. Although all PEB is important, simple and everyday PEB was considered more relevant to the research context and research population. Questions D1 and D2 tested the schoolchildren's behaviour in specific environmental behaviour scenarios. The questions were asked to determine if observations made by the researcher and news reports on behaviour were consistent with the respondents' verbal commitment and self-reported behaviours.

*Biographical details.* Section E captured biographic details of the participants regarding their socio-economic status, living conditions, relationship with the natural environment and mobility through sixteen questions. This information sheds light on the linkage between socio-demographics and PEB as highlighted by McCarty & Shrum (2001), Thompson & Barton (1994) and Stern (2000).

Some of the borrowed questions were reformulated and all items were formulated in relatively simple and straightforward language to be easily understood by secondary-level schoolchildren. All the questions were framed to reflect local issues and conditions.

### 3.3.2.2 Sampling of respondents

Participants were selected according to the class at JG van der Wath Secondary School in which they were by means of convenience sampling.[7] Although all the children in the school qualified for inclusion in the study, namely secondary-level schoolchildren from lower-middle-class families, it was important to have representatives from all the grade levels, i.e. 8 to 11. Eventually, 345 questionnaires were completed, namely 139 Grade 8s (40%), 54 Grade 9s (16%), 81 Grade 10s (23%) and 71 Grade 11s (21%). In the event, Grade 12 learners were excluded when it became apparent that participation would possibly interrupt their studies and cause distractions.

### 3.3.2.3 The didactical context

Participants were given 45 minutes to complete the questionnaire of which there was only an English version. The time taken to fill in the questionnaire varied by participants' grade level, the majority taking 20-30 minutes. The survey was done during the Life Skills and Basic Information Science (library) periods to minimise interruptions of the school programme. Participants were at ease by informing them that the questionnaire was not a test but a way to get an understanding of how each learner thinks and reasons. All participants were encouraged to give honest opinions, complete the questionnaire to the best of their ability and that there are no wrong or right answers. A relaxed atmosphere was created in which participants felt comfortable to ask questions if any uncertainties arose. Some participants had difficulty understanding the meaning of the option 'neutral'. Otherwise, no problems were identified throughout the survey phase.

### 3.3.3   Participatory drawing as a tool to explore children's perceptions about their environment

Participatory drawing is an inclusive and interactive social science research method that has been used in child development research focusing on environmental psychology, clinical therapy and spatial cognition (Young & Barrett 2001). It is an engaging, enjoyable and fun activity that removes possible tension among child participants. According to Thomas & Silk (1990), children's drawings are a reflection of the image of their minds as it provides a 'window' into their thoughts and feelings. Drawing is a creative depiction of physical and abstract realities with no limitations to form (Banks 2001). Drawing is a playful activity that demands no linguistic proficiency making it an ideal research method when working with the youth from different backgrounds and across a variety of cultural contexts (Literat 2013; Rennie & Jarvis 1995). A

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[7] Convenience sampling is also known as accidental sampling or haphazard sampling because researchers make use of participants who are available and willing to participate (Gravetter & Forzano 2015).

drawn image stretches beyond the limitations of words and language as a combination of complex emotions, identities, concepts and metaphors can be easily constructed, no matter the mental capability of individuals (Gauntlett 2007). Cherney et al. (2006) point out that with increased dexterity and maturity children draw things as they are known rather than as they are perceived. Drawing as a form of expression allowing individuals to extend beyond the domain of cerebral thought as they engage in physical acts of creation. Creative and abstract thoughts are stimulated so portraying images of identities and concepts. Another advantage of participatory drawing as a research tool to explore ideas is that it prevents children from feeling obligated to try to match their knowledge with that of the researcher (White & Gunstone 1992).

Participatory drawing differs significantly from research methods such as focus groups and interviews, as it gives participants time to conceptualise and contemplate their responses (Gauntlett 2007). The method is also versatile as it can be implemented at all stages of a research process (Literat 2013). However, the primary disadvantage of drawing research is the difficulty of interpreting drawings to produce findings (Literat 2013). Also, children that feel they lack artistic ability may omit specific features because they are unable to draw them, thereby limiting expressed information (Trend, Everett & Dove 2000). Possible contradictory interpretations of the visual material can cause their validity to be questioned (Silverman 2001). Alland (1983) and Literat (2013) remind researchers that details of drawing style and basic strategies of drawing construction are dependent to cultural factors and that individuals often generate drawings that are a product of their cultural background.

According to Barraza (1999), drawing as a systematic measure for exploring children's environmental attitudes and perceptions is still being developed. Drawings have predominantly been used to investigate attitudes to environmental phenomena and as emotional indicators of environmental problems. Drawing was used by Brown, Henderson & Armstrong (1987) to explore children's perceptions of nuclear power stations; King (1995) examined children's environmental concern about the environmental crisis; and Barraza (1999) has evaluated future environmental concerns and expectations.

In this research drawing was used in conjunction with the questionnaire survey, transect walks (observations) and focus group discussions with the aim to complement or contradict themes that surfaced and to gain an improved understanding on the environmental perceptions of secondary-level schoolchildren from Okahandja. A total of 110 children from JG van der Wath Secondary School were selected to draw two pictures each. Participants in the drawing assignment were conveniently selected from two Grade 10 classes and one Grade 9 class. The drawing excercises

were administrated during two 45-minute sessions. Except for an introduction to the activity no further discussion was held. Each child was asked to construct two drawings, each based on the following statements:

1. Illustrate to someone who has never been to Okahandja what your town or neighbourhood look like now. What images come to mind when you think about your surroundings in Okahandja? (Drawing 1)
2. Illustrate how you wish Okahandja will look in the future. (Drawing 2)

Drawing 1 was used to explore the children's perceptions of the current state of Okahandja and Drawing 2 was used to ascertain how they want Okahandja to change. The purpose of Drawing 1 was to find out if the children depicted environmental problems in their drawings, demonstrated specific concerns and indicated spaces that interested or concerned them in their local environment. Drawing 2 served to illustrate features the children felt to be lacking in their present environments and to establish how they want their future environments to look.

All participants received an A3-sized white cardboard page that they divided into two, a side for each drawing. Each participant was given a packet of 16 oil pastels of different colours. Coloured drawings were desired because they facilitate richer expression and greater levels of satisfaction. Participants were reassured that the activity will not affect their academic achievement in any way and that different and unique illustrations would were welcomed. They were encouraged to illustrate their own interpretations of their surroundings and not those of the researcher or anyone else. To avoid misinterpretation by the researcher and to ensure that she clearly understood the illustrations and depicted information, each child was informally interviewed on completing the drawing exercise. Notes were made during the interviews.

### 3.3.4  Focus groups to detect ethnical differences in PEB

Focus groups are "carefully planned series of discussions designed to obtain perceptions on a defined area of interest in a permissive, nonthreatening environment" (Krueger & Casey 2009: 1). One of the many advantages of focus groups discussion is that the opinions, beliefs and attitudes of participants are voiced (Kleiber 2003). Focus groups stimulate possible debate among individuals as they discuss the inconsistencies between their ways of thinking (Kitzinger 1994). Candid discussions generate useful information and insights that help explain how and why the group members feel specific ways. The essence of focus groups is to cover a diversity of opinions rather than reach consensus (Kleiber 2003).

In the Okahandja research focus groups were used to examine whether children from different ethnic groups reason differently about the environment and whether these distinctions influence their interactions with their surroundings. Responses given to the questionnaire survey were reviewed to discern similarities, contradictions or ambiguities. This aided the formulation of questions to provide clarity on selected issues and arguments. This helped to get some perspectives on the nature and level of interest and knowledge the children possess about the topics. Even though environmental behaviour and ethnicity have never been studied in a Namibian context this study aimed to determine if there are differences in the environmental reasoning of different ethnic groups having different beliefs, traditions and self-pride. It was deemed important to determine if and to what extent ethnicity influences the children's environmental thinking and behaviour. Focus group participants were selected through purposive sampling based on the ethnic group they ticked in the questionnaire (Question E4). In purposive sampling "the sample units are chosen because they have particular features or characteristics which will enable detailed exploration and understanding of the central themes and puzzles which the researcher wishes to study" (Ritchie, Lewis & Elam 2003: 78). The sampling is done strategically so that research questions can be answered (Bryman 2012). Participants were purposefully selected for two reasons: (1) to ensure that key constituencies relevant to the study were covered and (2) to ensure the inclusion of diversity so that the impacts of specific characteristics can be explored, i.e. different ethnic groups representative of secondary-level schoolchildren from Okahandja.

Three focus group discussions were held. Each group represented a homogenous ethnic group (Ovambo, Herero or Damara). The groups consisted of eight individuals, four boys and four girls. This was done purposely to prevent bias towards a specific gender. However, due to administrative reasons, equal representation of different grade levels was not possible. The discussions were facilitated by the researcher in three stages: (1) after a brief introduction, information was obtained about participants' background, (2) themes and questions of interest were discussed in-depth and (3) the sessions were concluded by asking for recommendations, suggestions and future solutions to environmental problems in Okahandja. Participants were urged to observe the ground rule of listening, requested to speak one at a time and to respect each other's viewpoints. The facilitator, probed and clarified when needed to guide the discussion. The discussions were not voice recorded to avoid any discomfort among discussants that would influence their willingness to express honest opinions. The researcher did however make written notes during the discussions, each of which lasted for about 35 minutes during which the discussants exchanged views on the following questions:

1. Do you regard Okahandja as your home town or just a place of residence? Explain your answer.
2. Do you behave differently in other places or towns compared to Okahandja? In which way?
3. Do you behave differently in public spaces compared to your home environment? In which way?
4. Do you think about the effects your daily interactions might have on the environment? Why?
5. Whose example do you follow when it comes to your environmental behaviour? Elaborate.
6. What are the main environmental problems facing Okahandja?
7. Do you have any suggestions on how to improve or solve these problems?

The focus group discussions aimed particularly to gain an in-depth understanding of how the secondary-level schoolchildren think and why they would possibly behave in a certain manner. The exercise was also done to assure participants that they are capable of identifying problems and proposing meaningful solutions. It also contributed to the empowerment of the participants as they became aware of the difference they can make as active agents of change. Kaplan (2000) has pointed out that by providing opportunities for understanding, exploration, and participation, effective group problem solving can lead to new multiple desirable choices.

In Figure 3.2 the different methods employed in the study are illustrated. It also shows the sequence in which the methods were implemented.
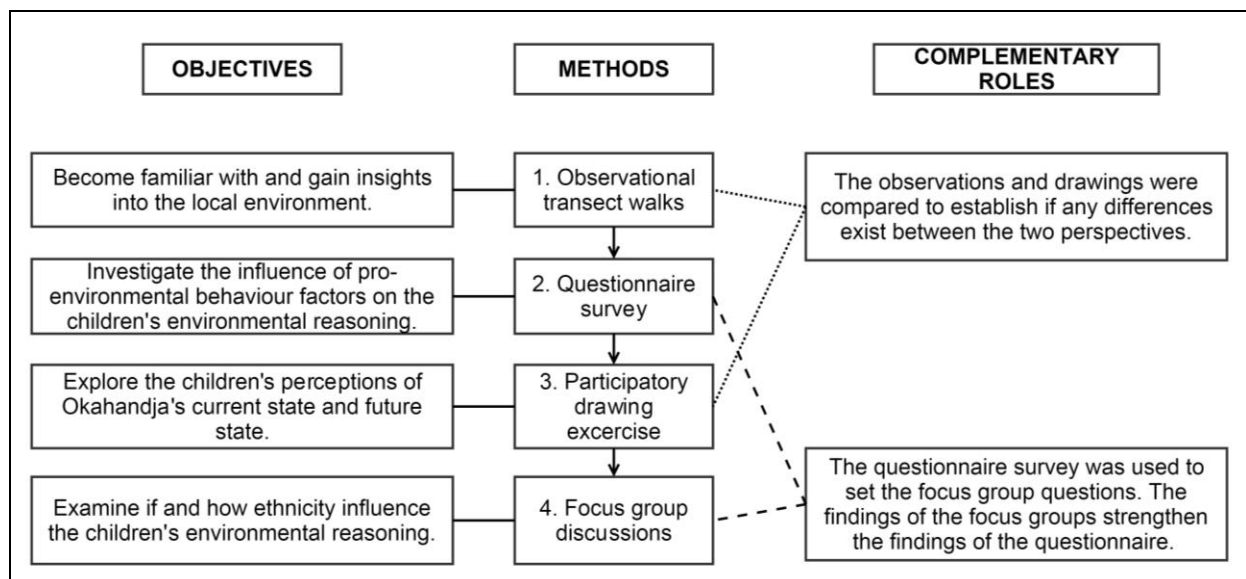


Figure 3.2 Research methods

The transect walk observations were done first to ensure that the researcher is familiar with the study area and understands the research context. Thereafter the questionnaire survey was initiated followed by the participatory drawing exercise. The transect walk observations and

participatory drawings were considered in conjunction to determine if any similarities or differences exist between the view of the researcher and the views of the children. Lastly, focus group discussions were held to clarify certain responses and themes of the questionnaire survey. All the methods employed served the purpose of complementing and supporting each other.

In Section 3.4 the next segment of methods is discussed. This includes the capturing and analysis of data.

## 3.4 DATA CAPTURING AND ANALYSIS

Information and data from the questionnaire were captured in Excel and imported into STATISTICA. All statistical analyses were executed in STATISTICA and Excel. For the analysis of the questionnaires, standard reliability and item analysis and one-way analysis of variance (ANOVA)[8] were used. Cronbach's alpha was used to evaluate the reliability of the scales used. Cronbach's alpha is a measure of internal consistency, relating to the reliability of the instrument. A Cronbach's alpha of ≥0.7 is considered to be good (Hutchinson & Johnston 2004). Items with high internal consistency measure the same concept (LoBiondo-Wood & Haber 2014). One-way ANOVA is an analytical technique which was used to determine if there are significant differences between the means of two or more independent groups (STATISTICAHelp 2015). The $H_0$ (null hypothesis) was used to state that there was no difference between the means of the groups while the $H_1$ (alternative hypothesis) stated that not all groups are equal. To investigate the statistical differences between the one-way ANOVA results further, a Fisher's least significant difference (LSD) test was used. The Fishers LSD test is a post hoc test which is used to set individual t tests that test the smallest significant difference between the means of groups (STATISTICAHelp 2015). The graphs in the thesis were designed in Excel and the maps in ArcMap 10.0.

Notes of the focus group discussions and the transect walk observations were recorded in writing by the researcher. The transect walk-checklist was used to ensure that observations were conducted similarly in all residential areas and the observations were recorded in the researcher's notebook. After each transect walk, the observations were rewritten in a narrative format for later reference. The observations were grouped in two categories; social and physical. Social observations included aspects such as employment and availability of schools and the physical observations were used to describe the presence of pollution, type of housing and services.

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[8] The researcher recognises the possibility of biased results and findings when applying quantitative statistical techniques on a non-probability sample.

Photographs were studied to confirm observations. Notes on the focus groups discussions were also rewritten immediately after the discussions ended.

Before any analysis or interpretation of a drawing was made, attention was given to the first impression each drawing produced to get a general feeling about the drawing and the drawer's subconscious world. Thereafter, visual content analysis and interpretative content analysis were used to scrutinise the two drawings separately. Traditional content analysis counts textual elements compared to interpretative content analysis that identifies themes and ideas that may or may not be counted or described (Giarelli & Tulman 2003). Examination of each drawing revealed specific 'content' of abiotic and biotic elements. Inspection of the drawings uncovered similarities, differences and trends that helped the evaluator to get a 'look and feel' of the main 'environmental issues' or 'messages' presented in different qualitative styles such as patterns, and structures. Attention was also given to the way elements were drawn. This included colour, frequency, size, height as well as the use of symbology. Data derived from the participatory drawings was captured in Excel, various categories and sub-categories. Günindi's (2012) coding of drawing elements was used to quantify elements drawn in the current-state and future-state drawings. For the present-state drawings, people, plants, animals, abiotic elements, buit-up features, dirty environmental elements, clean environmental elements and socio-economic issues were used as categories. Similar categories were used for the future-state drawings, namely people, plants, animals, abiotic elements, built-up features, clean environmental elements and features of community cohesion. Elements were counted, tallied and captured in Excel to determine the frequencies. Analyses and the findings of the drawing exercises are discussed in greater detail in Chapter 5.

## 3.5 CONCLUSION

This chapter explained a mixed-methods approach used. Observations were made during transect walks to familiarise the researcher with local residential contexts. A questionnaire survey was administered to ensure a representative sample, focus group discussions were held to add clarity to information elicited by the questionnaire. While a participatory drawing exercise was done to provide insights into the children's way of living, their thinking and their expectations. The methods were used in conjunction to strengthen the findings. Chapter 4 presents the results and findings of the questionnaire survey and focus group discussions.

# CHAPTER 4 RESULTS AND ANALYSIS: HABIT IS STRONGER THAN REASON

## 4.1 INTRODUCTION

This chapter reports the findings of the quantitative dimension of the study based on analyses of the questionnaire survey as primary source of information. This information will be supported by the findings of the focus group discussions and the transect-walk observations to add explanation to the responses of the participants. This being said, it should be kept in mind that geography belongs to the 'soft' side of Becher's (1987) matrix of disciplinary cultures, therefore the results should not be analysed in too much statistical depth (Tam, Fry & Probets 2014). The chapter begins by sketching a background on the participants that completed the questionnaire, followed by a presentation and discussion of the findings about the EBFs (environmental knowledge, environmental concern, place attachment) as core of the envisaged study. The results of the participatory drawing project and the inferences deduced from them are treated later in Chapter 5.

## 4.2 PROFILE OF PARTICIPANTS

Section 4.2 provides a detailed description of participants. In this section, socio-economic and demographic elements are discussed. First, participants' grade level, area of residence and ethnicity are revealed. Second, their closeness with and dependency on the natural environment are investigated. Third, their access to environmental information and media is assessed followed by their level of mobility.

### 4.2.1   Grade level, residence and ethnicity

Three-hundred-and-forty-five schoolchildren attending JG van der Wath Secondary School completed questionnaires. More females (58%) participated than males (42%) (Figure 4.1a). Figure 4.1b shows that most (40.3%) of the participants was in Grade 8, 15.7% in Grade 9, 23.5% was in Grade 10 and 20.6% in Grade 11. Because of possible discrepancies between grade level and age (some children being older or younger than their classmates), grade levels rather than age categories were used in the comparative analyses. This is particularly important regarding the knowledge and skills the children were expected to possess at different stages of their educational training.
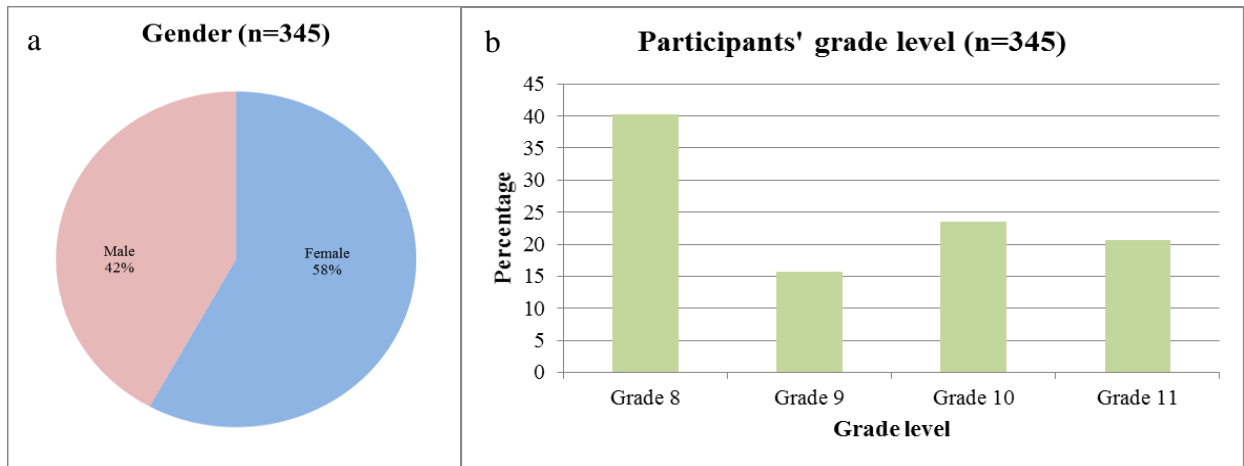
Source: Survey questionnaire

Figure 4.1 Gender (a) and grade level (b) of participants

Regarding place of residence, most (46.6%) of respondents lived in Nau-Aib and the others in Central Okahandja (15.9%), Smarties (10.2%), Vyf Rand Camp (9%), Veddersdal (6.9%) and other residential areas such as Oshetu and Hodygos (11.4%) (Figure 4.2).
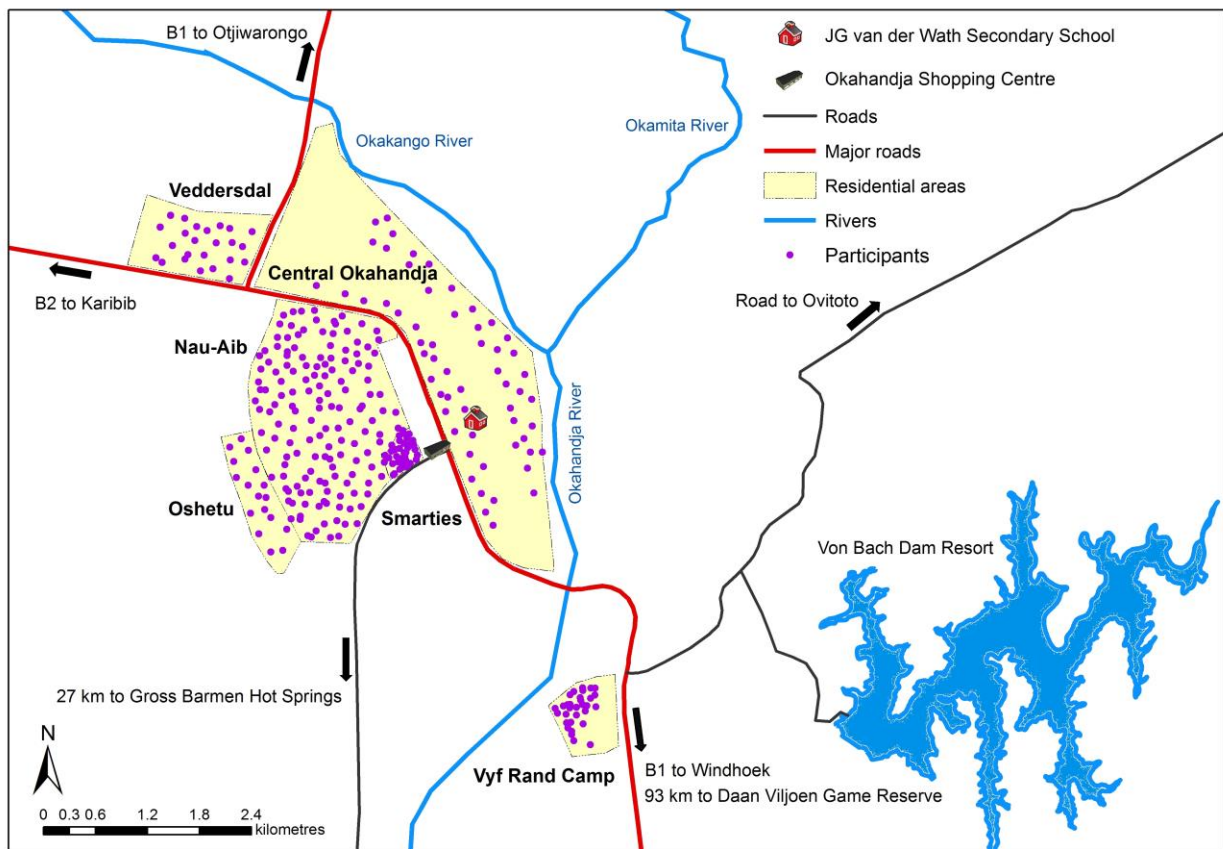


Figure 4.2 Place of residence of participants

The largest ethnic group of participants (29.6%) were Ovambo and the second largest (21.4%) identified themselves as 'other' which comprises Caprivians, mixed ethnicity (e.g. Herero-Ovambo), Kavango, Afrikaners and Angolans. The remaining participants were Herero (17.1%), Damara (15.4%) and Coloured (14.2%), with Nama the ethnic minority (2.3%) (Figure 4.3).

Although mixed ethnicity was to be expected, it was important to determine the ethnicity of participants as it enlightens traditions, cultures and history which may influence their perspectives and reasoning on environmental issues, environmental behaviour and place attachment.
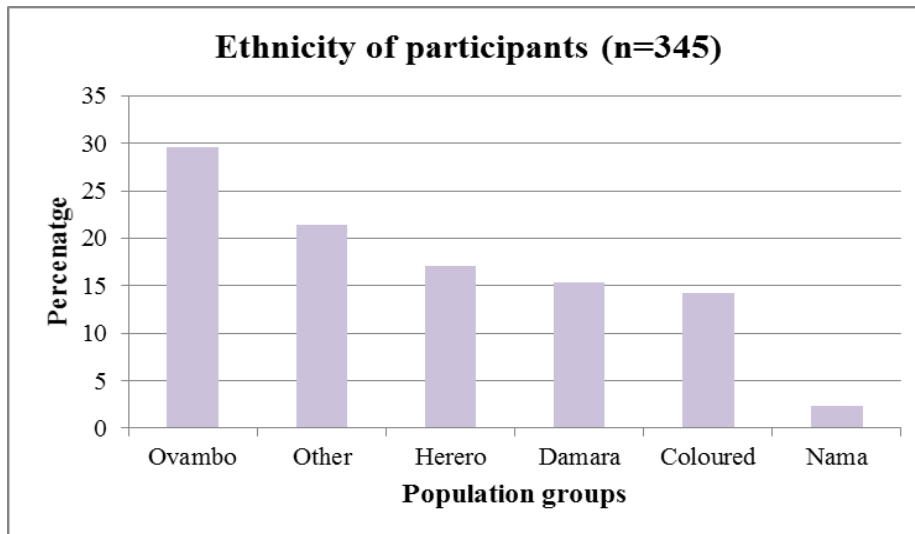


Source: Survey questionnaire

Figure 4.3 Population group of participants

## 4.2.2  Situational factors

When asked whether their family collects firewood and/or harvests natural food resources, 31.6% indicated that they took part in the former and 37.1% in the latter activity which involve collecting omajovas (termite-hill mushrooms), marulas (fruit), mopani worms and the hunting of wild animals (Figure 4.4). Observations during the transect walks provided evidence that firewood is primarily used to meet daily fuel requirements for cooking. This corresponds with the broader picture of fuel types used for cooking in the Otjozondjupa Region in which Okahandja is located (Figure 4.5). Nearly four-fifths (77.7%) of participants indicated that their families own livestock and that more than half (52.8%) of the families have vegetable gardens. Four out of five (83%) indicated that they have family members or relatives farming and/or living on communal lands. During the focus group discussions various participants often referred to 'the farm'. Given that all of the participants live in areas close to or adjacent to the natural environment (peri-urban), their use of natural resources and frequent experience of natural environments was expected and this quite likely strengthens their relationship and perceptions of the natural environment. The literature reveals that many environmentalists insist that hours spent in nature during childhood or adolescence was a contributor to their commitment to the environment (Chawla 1992; Palmer 1998b). The fact that participants in this study frequently experience the natural environment and partake in activities within the natural environment can

influence the value and importance they tie to it which can subsequently influence their environmental concern and behaviour.
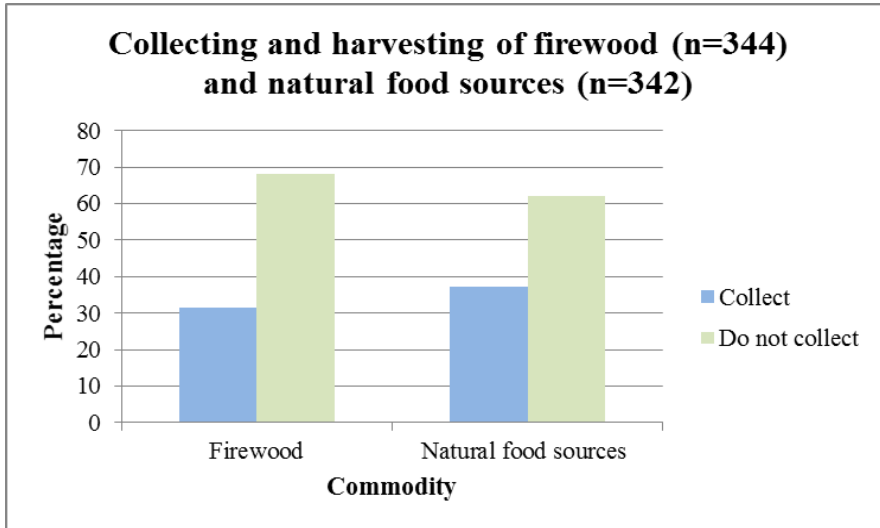


Source: Survey questionnaire

Figure 4.4 Use of natural resources by participants
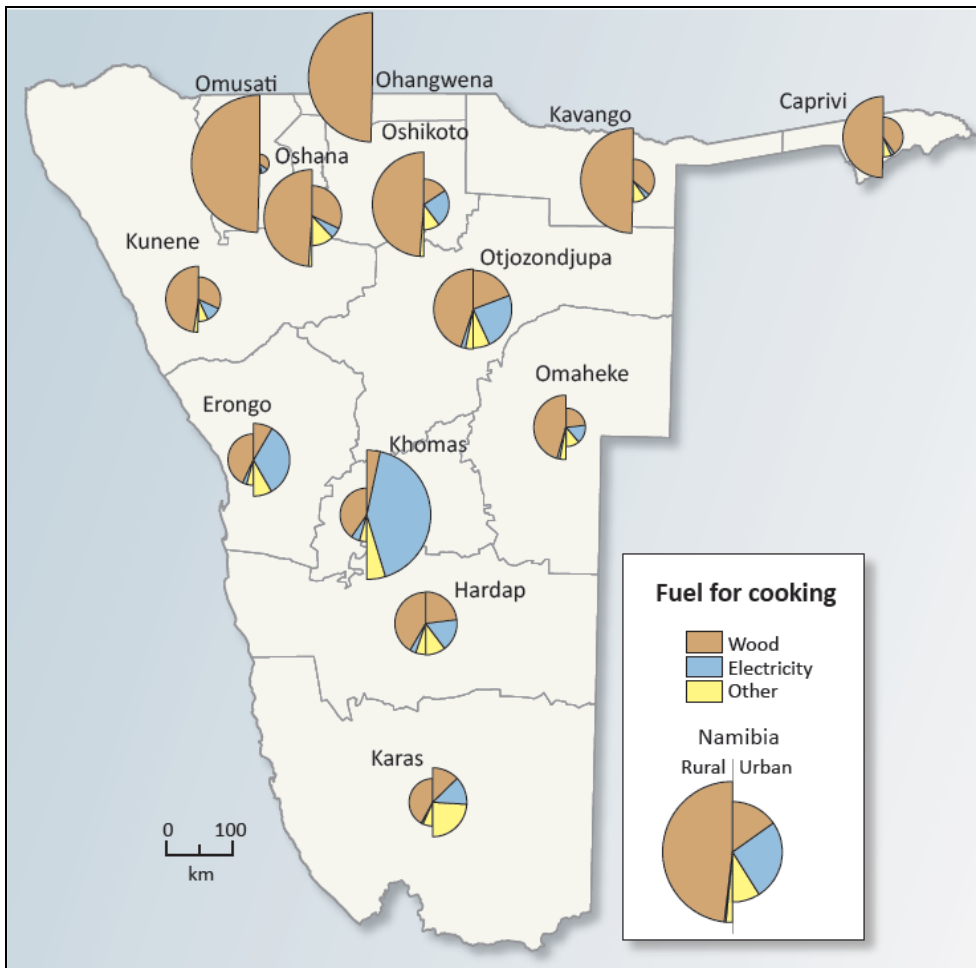


Source: Central Bureau of Statistics (2010: 56)

Figure 4.5 Proportion of Namibian households using wood, electricity and other fuels for cooking, 2001

When asked which environment-related school subjects participants take, less than 5% indicated that they did *not* take any such subject (geography, agriculture or biology/life science (Figure 4.6a). A related enquired after their access to sources of information. It transpired that 89% have a working television set in their homes, whereas two out of five participants (41.2%) did not have access to daily newspapers (Figure 4.6b). This latter finding is supported by a teacher of English who commented that "It became apparent to me that few children have access to reading material when I started bringing old newspapers to my classroom. They seem to have a thirst for reading." Research has shown that frequent exposure to environment-related media content or TV news correlates positively with environmental concern (Holbert, Kwak & Shah 2003; James, Morgan & Madsen 1997) and environmental knowledge (Ostman & Parker 1986). The significance of participants' access to environment-related information and media will be highlighted in Section 4.4.
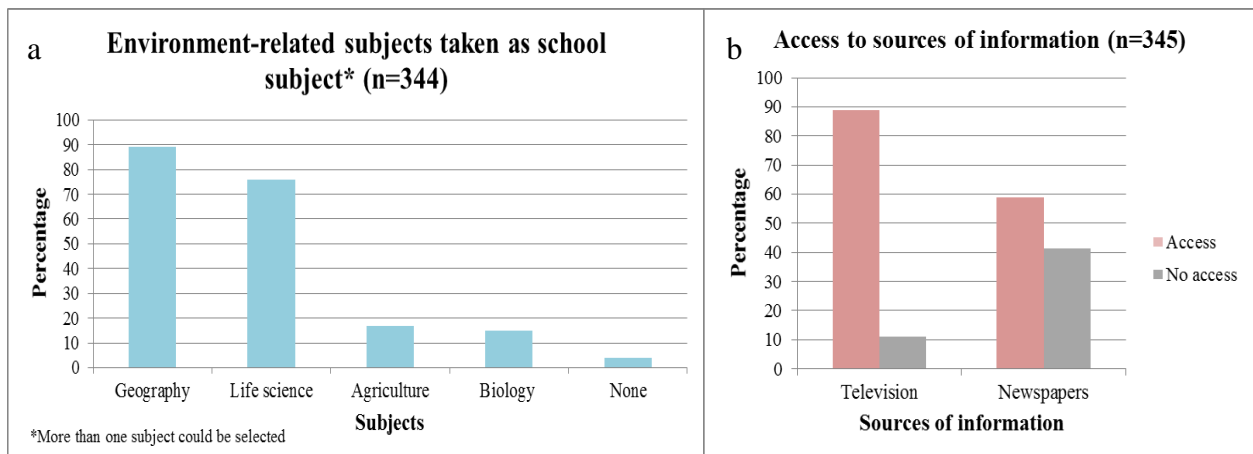


Source: Survey questionnaire

Figure 4.6 Environment-related school subjects (a) and access to information (b)

Concerning the possession of means of transport, 65.5% indicated that their family owns motor vehicle(s). Participants' families travelled to places away from Okahandja by hitchhiking (15%), taxi (10%), train (4.9%), bus (3.5%) or aeroplane (1.1%). Participants were asked if they have visited the leisure attractions Von Bach Dam Resort, Daan Viljoen Game Reserve and Gross Barmen Hot Springs. These leisure attractions are all within a one-hour drive from their residences. Gross Barmen Hot Springs was the most popular (69%) with 60% having visited Von Bach Dam Resort and only 16% the Daan Viljoen Game Reserve. It is noteworthy that Gross Barmen Hot Springs, situated less than 26 km from Okahandja, and the Von Bach Dam Resort (11 km from town) have not been visited by about one third (31%) and two out of five respondents respectively. That four out of five (84%) have not visited Daan Viljoen Game Reserve is no doubt due to it being farthest (93 km) away. Because some participants have never

experienced these major leisure opportunities in the area it may influence how they perceive the tourism potential and significance of these tourist destinations for the Namibian economy and the town's socio-economic well-being. This can also hinder them from understanding the importance of a protected environmental in and around Okahandja.

The farthest place travelled to by participants from Okahandja was explored. The results are shown in Figure 4.7 where groupings into the 14 regions of Namibia, namely Oshana, Erongo, !Karas, Otjozondjupa, Kunene, Hardap, Zambezi (previously called Caprivi), Kavango (Kavango East and Kavango West), Omaheke, Oshikoto, Ohangwena, Khomas and Omusati are made (arranged here in order of responses). A separate category was assigned to travelling abroad. Within Namibia, 22% of respondents' farthest region travelled to is Oshana the capital of which, Oshakati, has experienced exponential urban growth. This finding is not surprising given that 30% of participants are Ovambo children. Significantly, 23.8% of participants have travelled outside the borders of Namibia, mainly to African countries like South Africa, Angola and Zambia. Overall, 5.2% have never travelled outside their region of residence (Otjozondjupa Region).
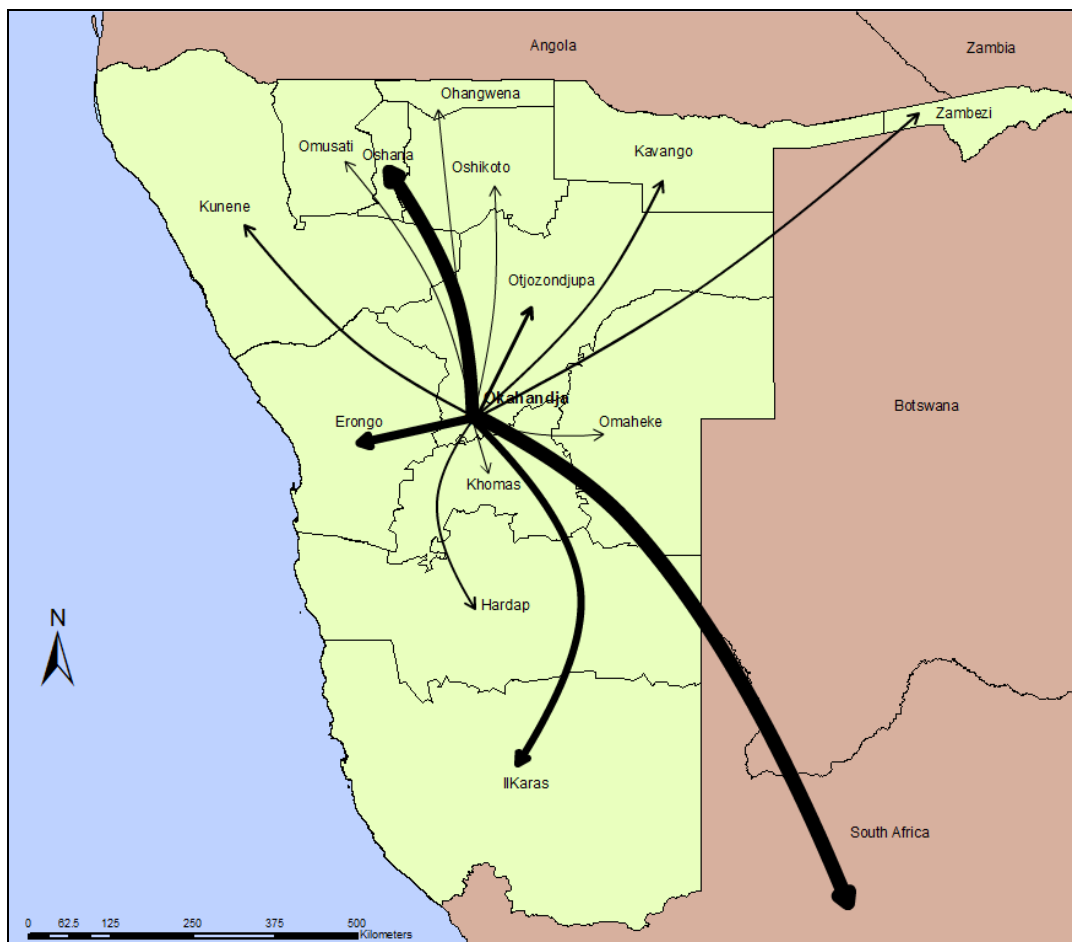


Source: Survey questionnaire

Figure 4.7 Farthest participants have travelled from Okahandja

The information and perspectives on the participants' and their families' sociodemographic status, livelihoods, access to information and mobility contribute to a greater understanding and appreciation of the circumstances of the broader community and the schoolchildren. Berger (1997) contends that because the role of socio-economic factors is complex other factors may mediate the relationship between these factors and environmental behaviour. In the remaining sections of this chapter the various EBFs will be discussed individually. To inform and enrich the discussions, sociodemographic details are incorporated to help understand the roles the factors and relationships play in the construction or hindering of PEB. The first EBF considered is awareness of place and its relationship to mobility.

## 4.3 AWARENESS OF PLACE

According to Matthews (1985) children's awareness of place is created through repeated contact. Scholars have found that higher frequencies of visits to a park are related to higher place attachment (Bricker & Kerstetter 2000; Moore & Graefe 1994; Moore & Scott 2003; Williams et al. 1992). Accordingly, an individual who frequently visits a place is more likely to protect it if it is under threat because they will attempt to ensure the quality of the place is maintained by acting altruistically (Halpenny 2006). Literature suggests that visitations to natural areas can foster environmental awareness and PEB (Chipeniuk 1998; Halpenny 2006; Harvey 1989).

In this study, no significant statistical difference was found between the environmental concern, awareness and behaviour of participants that travelled outside Namibia and those who did not. One-way ANOVA was used to determine if differences exist between the environmental awareness and environmental concern of participants that travelled farther and those who did not, but p-values of much higher than 0.05 were generated. This can be because three quarters (76.2%) of the participants have never travelled outside Namibia and the places that have been visited in Namibia are relatively close. The participants did, however, make frequent reference to the cleanliness, aesthetic appeal and characteristics of other places. It is reasonable to assume that people's mobility, access to place and awareness of place contribute to an individual's understanding of places. The extent to which participants have moved beyond their place of residence as well as the nature of the places and spaces they have seen and interacted with, may influence their PEB.

Due to the lack of literature explaining the linkage between mobility, awareness of place and PEB, the researcher postulates that interactions at other places may provide individuals with 'comparative mental landscapes' which may influence their frame of reference when

differentiating between appropriate and inappropriate behaviours or occurrences. Ittelson et al. (1974) argued that the environment is cognised as a set of mental images and that people develop conceptions of the places they live in and spaces they interact with. Therefore, increased awareness of place may 'open the eyes' of children as they realise how a different place looks compared to their home environment. Furthermore, increased access to places may provide children with a 'refreshed' outlook on the interrelationship of places and the importance of a specific place in the greater scheme of things. By increasing children's awareness of place, they may be able to recognise the importance of tourism nodes and tourism routes. For example, a child from a low socio-economic community who has low levels of mobility may not understand the significance of tourism destinations in other parts of the country which may lead to him/her underestimating the importance of preserving his/her own environment. Because the sampled youths come from lower-middle-class families, may imply that they seldom experience Namibia (and specifically Okahandja) as tourists because many of the participants and their families merely experience survival on a day-to-day basis. But when given the opportunity to travel farther and experience tourist destinations, they might gain an understanding of the impact inappropriate environmental behaviour might have on the tourism industry and the attractiveness of places. Section 4.4 explores the environmental knowledge and environmental awareness of participants.

## 4.4 ENVIRONMENTAL KNOWLEDGE

Environmental knowledge and awareness are particularly important because they create a greater likelihood of people's environmental concern and PEB (Ajzen 1985; Cottrell 2003; Grob 1995; Hines, Hungerford & Tomera 1986/87; Hungerford & Volk 1990; Mobley, Vagias & DeWard 2010; Oğuz, Çakci & Kavas 2010; Zsóka 2008). Furthermore, environmental behaviouralists (e.g. Kals, Schumacher & Montada 1999; Pooley & O'Connor 2000; Schultz 2000) have posited that increased knowledge about place increases the likelihood of PEB because individuals develop a sense of responsibility and commitment (Walker & Chapman 2003). However, the weak relationship between knowledge acquisition and behaviour is a well-reported phenomenon (Bartiaux 2008; Cleveland, Kalamas & Laroche 2005; Kaiser & Fuhrer 2003; Laroche, Bergeron & Barbaro-Forleo 2001; Maloney & Ward 1973; Van Liere & Dunlap 1981; Zsóka et al. 2013). Nevertheless, knowledge can be a vital component when attempting to understand the driving forces behind individuals' environmental behaviour and environmental cognitions. In Subsection 4.4.1 the role of the school syllabus and teachers in creating environmental awareness among schoolchildren is explored. Thereafter the results and analyses of participants' general

environmental knowledge are discussed (Subsection 4.4.2). Section 4.4 is concluded with a discussion on participants' general environmental awareness.

### 4.4.1  The role of the school syllabus and teachers in environmental education

Because 95% of participants were taking one or more environment-related subject at school the content of the geography and life science syllabi was examined. One of the aims of life science in the Namibian education system is to "demonstrate desirable behavioural patterns and frame of mind in interacting with the environment in a manner that is protective, preserving and nurturing" (MoE 2010a: 2). According to the geography syllabus the subject aims to create awareness "that on earth and also in our country there are different ways of life, and this should lead to a positive attitude towards diversity" (MoE 2010b: 2). The role of geography in EE is highlighted by the MoE (2010b: 2) which states that "geography provides scientific knowledge about physical, environmental and human processes, which form the basis for cross-curricular education." Importantly, EE is stipulated as a cross-curricular issue in the life science syllabus.

Moreover, 62.6% of the participants indicated that teachers are their principle informants about the conservation of the natural environment. Participant's parents were identified as the second most informing (17.3%) whereas the government (10.9%), friends (2.4%) and others such as media (7.1%) also served as informing agents. Courtenay-Hall & Rogers (2002) point out that knowledge is a value-free and transmissible commodity passed on from teachers (who know) to students (who do not know) and Chawla & Cushing (2007) reported that environmentalists frequently made reference to their childhood role models who allowed them to engage with nature and taught them about nature. Certainly, the values about environmental behaviour of mentors and role models can motivate or demotivate children to engage in PEB. Likewise, if teachers model carelessness toward PEB they can act as 'bad' role models which may discourage a child to apply PEB in daily life. Consequently, the role of schools and enthusiastic teachers should not be underestimated as they often serve as the principle carriers of environmental knowledge and awareness.

### 4.4.2  General environmental knowledge

Section A of the questionnaire aimed to test the environmental knowledge of participants (cf Figure 4.8). Participants were asked, among others, about the mutual reliance of organisms and the impact of the chopping down of trees on soils. Overall, participants displayed good levels of knowledge of the four issues but scored relatively lower on issues related to air-pollutant emissions and the availability of clean drinking water in Namibia. The general trends in the figures are that environmental knowledge and awareness increase slightly with increasing grade

level, with a concomitant decrease in uncertainty. This is an indication that continuing schooling does increase awareness of environmental issues and should be endorsed as an effective manner to foster PEB among young people.
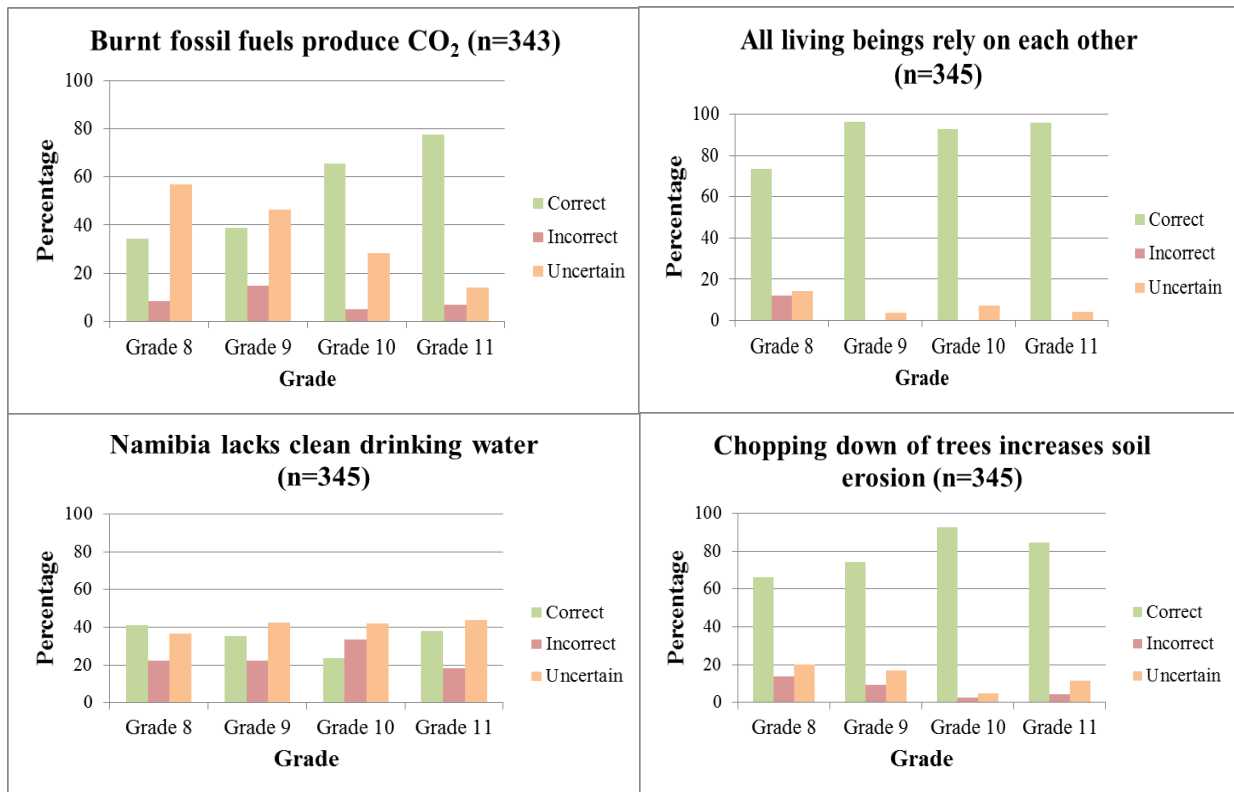


Source: Survey questionnaire

Figure 4.8 Participants' knowledge about four environmental issues

The apparent unawareness of the lack of clean drinking water in Namibia demands further comment. Smith (2011) makes known that a lack of clean water causes 23% of all deaths of children under the age of five in Namibia. The children's high level of uncertainty and low level of awareness of this issue is probably because the participants have not themselves been affected by or experienced clean-water scarcity. During the focus group discussions a Herero male commented: "I have not suffered any loss or discomfort due to a lack of water and will only save water if there is no water." This indicates that some of the participants tend to behave egoistically. This is congruent with the South African study by Anderson et al. (2007: 157) who found that "those most likely to be directly affected by water pollution are also most likely to see it as a problem." Therefore, if individuals experience poor environmental conditions or environmental degradation, they are more likely to perceive them as problematic. Hunter, Strife & Twine (2010) found that spatial proximity of problems correlates directly with environmental concern about these issues. They also discovered that residents' concern about context-specific

environmental issues is directly linked to the impact they have on livelihoods, daily resource needs and overall well-being.

These findings support those of Anderson et al. (2007) and Baldassare & Katz (1992) that PEB is strongly linked to the extent to which an individual has been or still is affected by environmental deterioration. People who are not affected by environmental deterioration or who do not possess a full understanding on the severity of the consequences of their actions might feel less need to act. When individuals do not experience discomfort or lowered standards of living due to environmental degradation their urgency to take action is lower. For this reason occurrences such as climate change might be obscure and difficult to fathom. This became particularly evident in among the participants when they suggested the burning of household and garden waste as a solution to littering and undesirable refuse heaps. When the researcher questioned their reasoning, one participant responded "out of sight, out of mind." This probably reflects an immature understanding of the complexity of environmental problems. Kahn & Lourenço's (2002) findings suggest that children at early adolescence tend to value individual and concrete elements of nature rather than complex constructs such as ecological systems or biomes. Dunlap & York (2008) found that poorer nations rated their community environments as poor while richer nations rated the world environment as poor. In this study it seems that the participants' thinking is restricted to the present situation in their local contexts rather than the future of the global environment. This accounts for the participants considering the burning of litter and refuse as acceptable because they focus on the current and visible problem without considering the consequences of their 'solution' on a larger scale over a long period.

### 4.4.3   General environmental awareness

To gain further insight into the environmental thinking, knowledge and awareness of the participants, they were asked whether they thought it is important for Okahandja to be a clean town and to provide reasons for their answers. Overwhelmingly (98%) they answered 'yes'. The reasons they gave were classified into four group, namely natural environment, social, aesthetic and economic awareness. The category 'natural environment' refers to the threat anthropogenic activities such as waste disposal poses on the natural environment and the survival of living organisms. The 'economic' group represents the impact a degrading environment may have on direct and spin-off economic activities. 'Social' awareness involves any discomfort or risks placed on people or communities and 'aesthetic' relates to the image and perception 'outsiders' get of Okahandja which may compromise the attractiveness of the town. Direct quotations from the open-ended question are marshalled in Table 4.1 to illustrate the participants' thinking about why it is important for Okahandja to be a clean town.

Table 4.1 Why it is important for Okahandja to be a clean town

| Natural environment | Social |
|---|---|
| • If Okahandja is not clean it will cause land pollution, greenhouse gases and global warming.<br>• Okahandja is the Garden Town and it needs to be clean to avoid dangers to the environment.<br>• If it is not clean, it will become an unhealthy place for animals, plants and people to live in.<br>• I would like my children to grow up in a clean environment in future. | • More people will want to live here and consider Okahandja a beautiful place.<br>• When it is clean no one can catch diseases and when people visit they can see people respect their town.<br>• There are a lot of small children playing in the rubbish or dirty water. |
| **Economic** | **Aesthetic** |
| • So that tourists can see Okahandja is a clean place and enjoy the place.<br>• To attract foreign investors and encourage future developments.<br>• A clean place is a happy place. A dirty town might affect the economy because it might be less attractive to tourists. | • Okahandja is in the middle of Namibia, most people from the north and south pass through Okahandja.<br>• A clean town says a lot about the people in it. So if it is dirty it gives a bad image about us.<br>• People are saying Okahandja is a rubbish bin town.<br>• To promote healthy living and reduce the spread of diseases. We want our town to be attractive with a reputation of cleanliness. |

Source: Survey questionnaire

As found by Huang & Yore (2003) and Kahn & Lourenço (2002) the Okahandja participants were able to distinguish between different kinds of environmental problems and the impact of misusing the environment. They were well able to recognise features and occurrences that might significantly impact on the place meaning of Okahandja. The participants are aware of the negative consequences undesirable environmental behaviour might have on the environment, communities and the economy (a notable exception was the participant's comment that "it is not my concern; I am not from this town").

Considering all the above dimensions of environmental knowledge and awareness, these responses show that a lack of environmental knowledge and awareness are not significant constraining factors to PEB for most of the respondents. Because the participants frequently come into contact with environment-related information and given that they displayed an understanding of intertwined human–environment relationships, show that they do possess certain environmental knowledge. Furthermore, they seem quite aware of what they do and the consequences of their actions on the environment and for themselves. Some of the participants do however seem to lack knowledge of action strategies (confer Hines, Hungerford & Tomera (1986/87)) that would mitigate or eliminate environmental problems. Some of their action strategies, such as the burning of household waste, can worsen the environmental conditions.

This can probably be linked to their socio-economic backgrounds as they might not know how to solve environmental problems with the limited resources at their disposal and the limited opportunities offered them in Okahandja, the place where they live. In this vein, the next section looks at the linkages and complex relationships between place attachment and environmental behaviour.

## 4.5 PLACE ATTACHMENT

Altman & Low (1992), Proshansky, Fabian & Kaminoff (1983), Scanell & Gifford (2010) and Vaske & Kobrin (2001) all agree that place attachment is a complex and multifaceted phenomenon. It not only describes the emotional attachment of people to a physical entity, but also represents associated meaning with, experiences in and relationships developed with a place (Altman & Low 1992; Rogan, O'Connor & Horwitz 2005). Vaske and Kobrin (2001) affirm that place identity is a strong predictor of PEB. Similarly, Gosling & Williams (2010) posited that strong place attachment induces stewardship and environmental concern which leads to environmental protection. In the subsections (4.5.1 to 4.5.5) to follow, the participants' place attachment to Okahandja and place meaning are discussed in detail.

### 4.5.1   Place attachment to Okahandja

Section B of the questionnaire required participants to read six statements about Okahandja and then to rate their personal attachment to the place on a Likert scale ranging from strongly disagree to strongly agree. The results are illustrated in Figure 4.9. Forty-three per cent of the participants disagreed (either disagree or strongly disagree) about the statement "If given a choice to live anywhere, I would choose to live in Okahandja" while 30% disagreed regarding "Okahandja is the best place in which to live". Sixty-seven per cent of the participants agreed (either agree or strongly agree) that they feel part of the community in which they live and 65% indicated that they miss Okahandja when they are away for too long. The statements with which participants disagree are possibly an indication of a weak place attachment which in turn might influence the way they feel about and behave in Okahandja. Also, the neutral responses to all the statements are worthy of comment. The prominence of neutral responses, rather than clear agreement or disagreement, can be an indication that participants were ambivalent and had mixed feelings about Okahandja or that they found it difficult to answer due to a lack of interest or concern. This is an indication that participants may lack a sense of citizenship and self-identification with Okahandja.
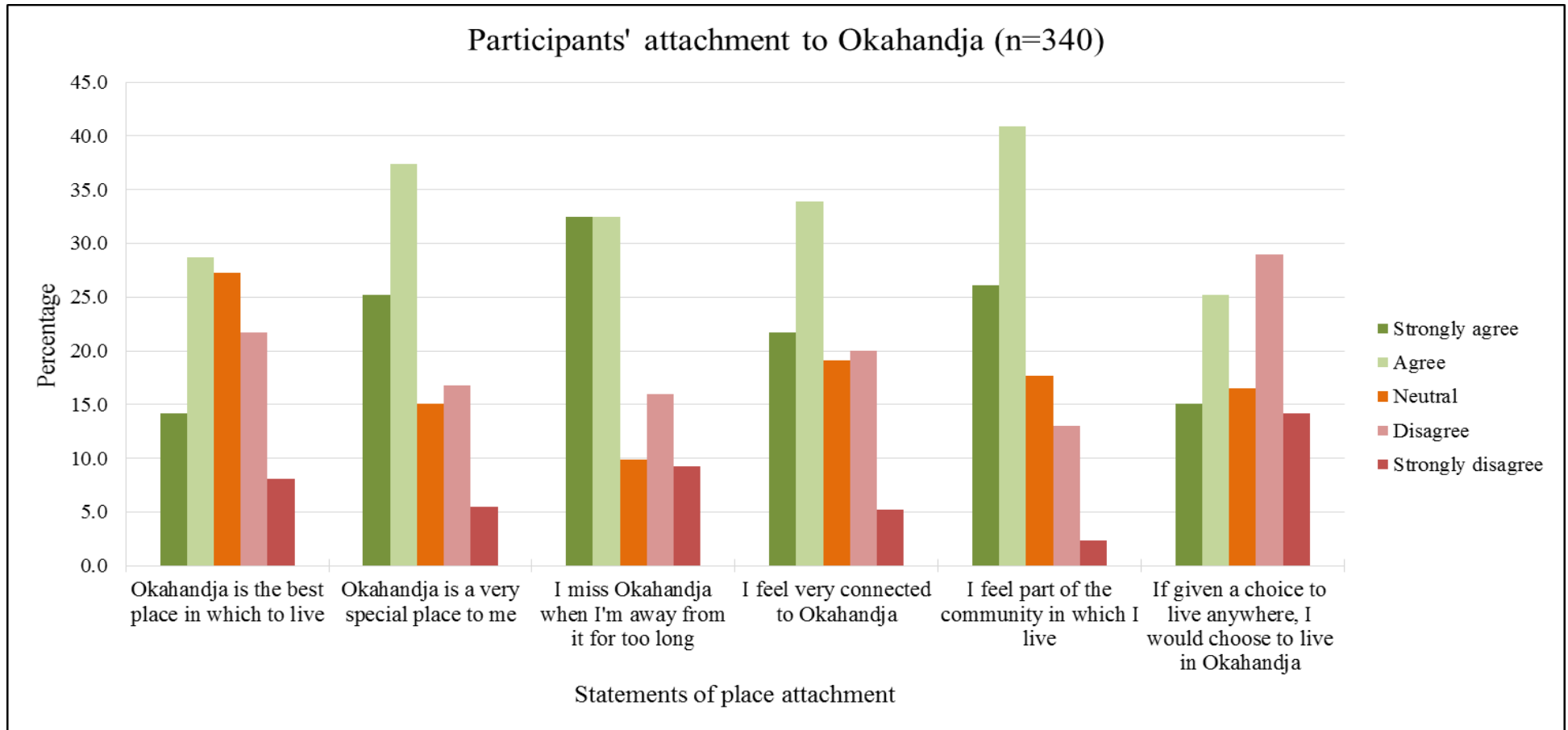
Figure 4.9 Place attachment to Okahandja

To obtain a collective perspective on the six items and for analysis with other sections, a summated index of the scale was created. A standard reliability and item analysis of this index yielded a Cronbach's alpha coefficient of 0.83 in STATISTICA (0.7 or higher was used as guideline). Also, the inter-item correlations between the items and the sums score are between 0.4 and 0.7 which indicate that the items (place attachment statements) accurately measured the same construct. This demonstrates a high level of internal consistency. For the construction of the histogram, 1.0 was assigned to strongly disagree, 2.0 to disagree, 3.0 to neutral and so forth. On a scale of 1.0 (strongly disagree) to 5.0 (strongly agree) a median of 3.5 was generated (Figure 4.10). The majority of the responses ranged between 2.8 and 4.0. Even though the histogram (Figure 4.10) slightly leans towards a stronger place attachment, it is clear that participants' place attachment is not prominent and well-defined but rather moderate and highly dispersed across the scale (strongly disagree to strongly agree) as also shown in Figure 4.9.
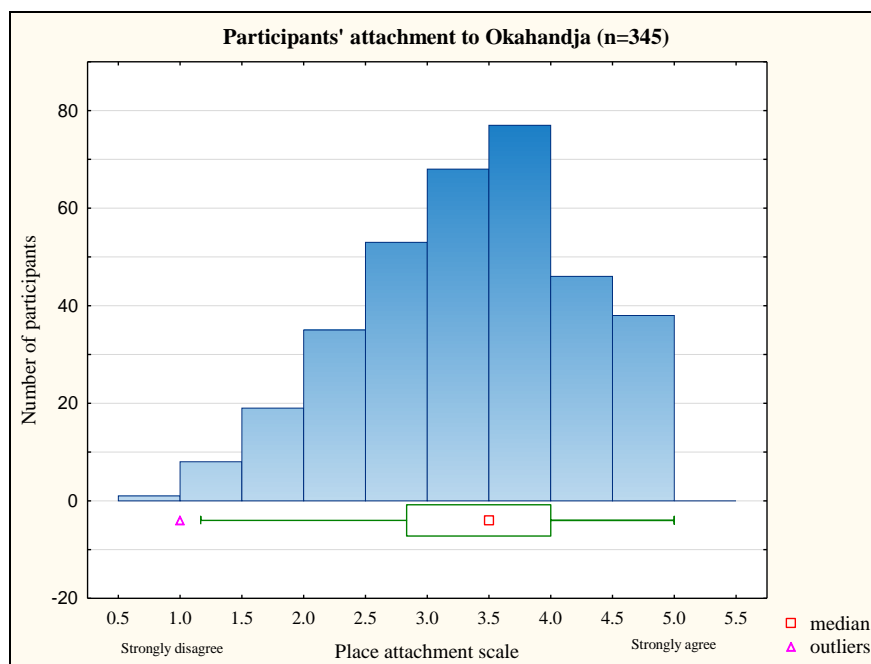


Figure 4.10 Summary of the place attachment scale

The lack of a strong place attachment can have implications for the environment as it can lead to reduced concern for place and willingness to undertake PEB. This will be discussed later in Section 4.5. In Subsection 4.5.2 the place attachment of the ethnic groups is investigated using the summated index of the place attachment scale.

### 4.5.2 Place attachment of different ethnic groups

One-way analysis of variance (ANOVA) was used to link place attachment with different ethnic groups to determine if there are differences between how attached different ethnic groups are to

Okahandja. As mentioned earlier, one-way ANOVA is an analytical technique which was used to determine if there are significant differences between the means of two or more independent groups (STATISTICAHelp 2015). $H_0$ was used to determine if there were differences between the means of the groups. $H_0$ was rejected (typically $\leq 0.05$) as a p-value of <0.01 was generated. It is clear that that there are differences between the ethnic groups' place attachment to Okahandja but does not show which groups differ significantly statistically from one another. To further determine the statistical differences in place attachment between the ethnic groups and to make comparisons, sub-hypotheses were compiled through a Fisher's least significant difference test (comparison technique). The Fishers LSD test is a post hoc test which is used to set individual t tests that test the smallest significant difference between the means of groups (STATISTICAHelp 2015).

Figure 4.11 shows that Ovambo participants have the strongest place attachment (mean of 3.62) and Coloured participants the weakest place attachment (mean of 3.06). To graphically illustrate the statistical differences between the ethnic groups on a graph 'a' and 'b' were used. Ethnic groups with the same letter do not differ significantly statistically. Even though differences exist between all the groups, Coloured participants' place attachment differ significantly from that of the Ovambo, Damara and Other participants, while Herero and Coloured participants' place attachment do not differ significantly. During the focus group discussions participants were asked if they consider Okahandja as their hometown or simply a place of residence. The majority (7 out of 8) Damara and Herero focus group participants felt that Okahandja is their home town and that family and friends living in Okahandja make their attachment stronger. Contrariwise, Ovambo participants saw Okahandja simply as a town in which to live and access schooling, and that they have stronger bonds with other places, such as Ovamboland. This is interesting because despite the fact that Ovambo participants felt stronger about other places, their place attachment to Okahandja was measured the strongest.

It became apparent during the focus group discussions that all three ethnic groups (Ovambo, Herero or Damara) behave differently in Okahandja than in other places. This can mainly be ascribed to Okahandja already being a dirty place and additional littering would simply add to the existing problem. While some referred to the cleanliness of Windhoek, others referred to Swakopmund's aesthetic appeal. One Ovambo participant commented that her mother would scold her if she behaved in Ovamboland as she did Okahandja. Certain behaviour is apparently considered acceptable in some places and unacceptable in others. One can conclude that an individual can display different environmental behaviours in different geographical areas. This contributes to the complexity of understanding place attachment and PEB.
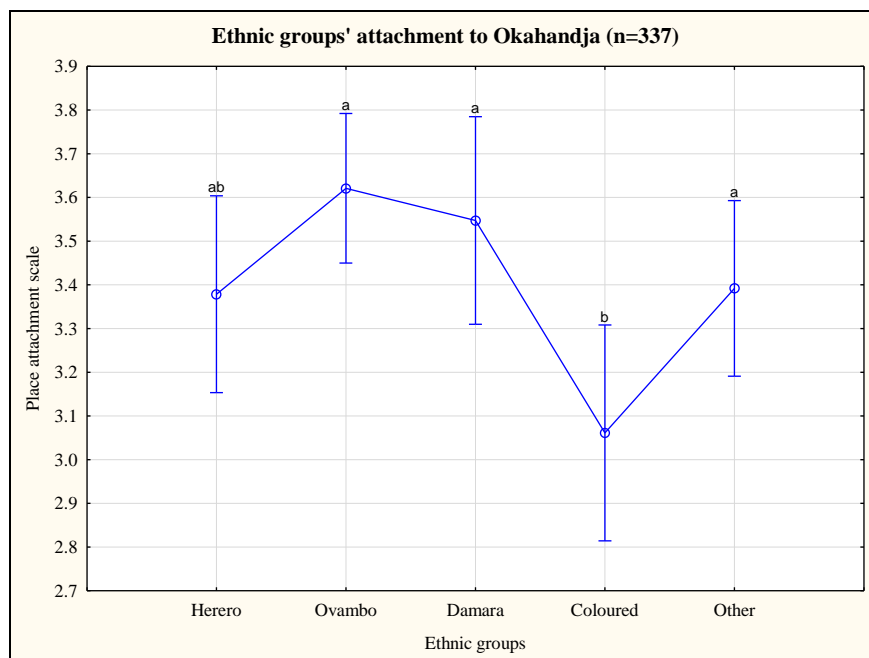
Figure 4.11 Place attachment according to ethnicity

After investigating the different ethnic groups' place attachment to Okahandja, Subsection 4.5.3 explores how attached participants living in different residential areas are to Okahandja.

### 4.5.3    Place attachment according to place of residence

The mean values of place attachment were also linked with residential area through one-way ANOVA. The resulting p-value of <0.01 indicates that significant differences exists between the place attachment of participants from different residential areas. Fisher's LSD test was applied to illustrate the differences in the place attachment of participants from different residential areas. The letters 'a', 'b' and 'c' were used to show the differences (Figure 4.12). While there are differences between the place attachment of participants from all residential areas, the most significant difference is between participants living in Vyf Rand Camp and Veddersdal. Participants residing in Vyf Rand Camp scored the highest place attachment mean (3.76) and those residing Veddersdal the lowest place attachment mean (2.97). These findings are consistent with those of the previous section because Coloured people tend to reside in Veddersdal and 80% of questionnaire respondents living in Vyf Rand indicated that they are Ovambo. This is an unexpected result because Vyf Rand Camp is an informal settlement with very poor service delivery, high unemployment rates and harsh living conditions (See Chapter 1). Fried's (1963) study on attachment showed that despite the poor physical conditions of an area, residents were strongly attached to their neighbourhood because of social interactions with others. Stedman (2003) reported that even though the physical environment may change or deteriorate the symbolic meaning may remain the same and keep place attachment intact. Social aspects such as culture may influence individuals' attachment as they become attached to areas where they may

practice, and thus preserve, their cultures (Fried 1963). The strong attachment of the Vyf Rand Camp participants may also be linked to their considering Vyf Rand Camp to be a place of refuge.
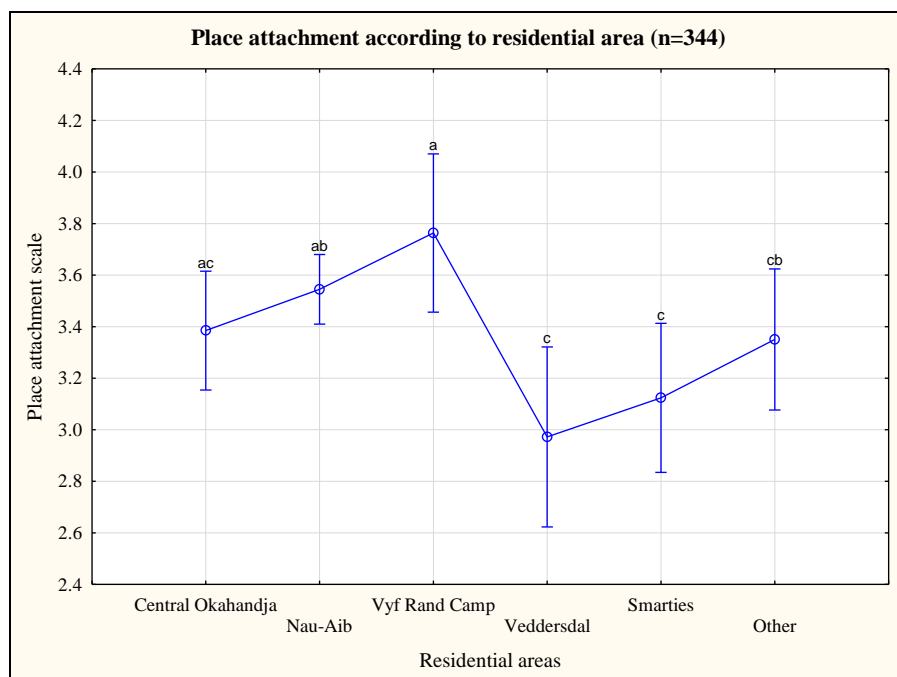


Figure 4.12 Place attachment according to area of residence

To explore participants' feelings and attachment to Okahandja in greater depth, elements of Okahandja that they are proud and ashamed of are discussed in Subsection 4.5.4.

### 4.5.4 Elements that make participants feel proud and ashamed

Despite the complexity of place attachment, participants were asked in an open-ended question to say what about Okahandja make them proud or ashamed of the town. By weighing that which make them proud against that which make them ashamed light can be shed on explanations of the moderate place attachment. Twigger-Ross & Uzzell (1996) found that residential place attachment translates into feelings of pride about a residential area and its appearance. Pride and shame are examined in more detail in the next two subsections respectively.

4.5.4.1 Aspects of pride

The features specified that made the respondents proud were classified into five dimensions, namely people, developments, institutions, natural environment and the town itself. The dimension 'people' relates to the benevolent characteristics of people in Okahandja that underlie good and supportive relationships between members of the community. 'Developments' relate to recent or in-progress improvements made to infrastructure that may enhance quality of life. Aspects the participants felt improve their social capital were assigned to 'institutions'. The

dimension 'natural environment' is self-explanatory as it refers to the any natural occurrence, while 'town itself' includes all features participants believed to make Okahandja a special or exceptional place. The three dimensions with the highest frequencies are developments (27.7%), people (24.6%) and the town itself (20.5%), whereas the natural environment (11%) and institutions (16.2%) feature to a lesser extent (Figure 4.13). Regarding developments, the new shopping centre built close to the highway was identified as a significant improvement to previously available amenities owing to the location of the shopping centre where people are able to access goods and services without travelling long distances. Strong social relations and community cohesion add prominence to the 'people' dimension. Participants described their community members as 'respectful', 'peaceful', 'caring' and 'we stand as one'. Regarding the town itself, participants highlighted Okahandja as the Garden Town of Namibia and that the history and cultural heritage of the town made them proud. 'Institutions' mainly refers to the good quality of education offered at schools in Okahandja. These dimensions were collectively summarised in a Grade 11 learner's response: "It is a beautiful and breathtaking place, it is developing and the people are very friendly."
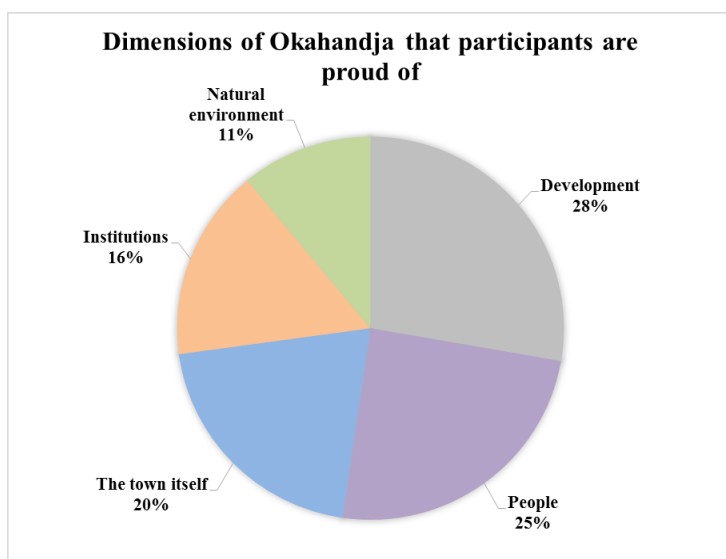


Source: Survey questionnaire

Figure 4.13 Dimensions of Okahandja that participants are proud of

4.5.4.2 Aspects of shame

Six dimensions, namely natural environment, social issues, informal settlements, people, infrastructure and services, and image were identified to aggregate the viewpoints (Figure 4.14). The dimension 'natural environmental' scored exceptionally high (48.8%) as frequent reference was made to environmental degradation by littering and refuse disposal. Various socio-economic issues such as teenage pregnancies, crime, alcohol abuse, school dropouts and unemployment, comprised the dimension 'social issues' (21.6%). According to Uzzell, Pol & Badenas (2002)

individuals positively identify with a neighbourhood in which they can successfully carry out daily activities to reach self-efficacy. This might not necessarily be the case in Okahandja as some people there are struggling to make a day-to-day existence and they face various problems that hinder them from achieving a reasonable standard of living. The dimension labelled 'people' (11%) relates to the inappropriate behaviour and attitudes of people in the communities. One respondent said "people have the 'I don't care' attitude which causes littering and an unhealthy environment." The dimension 'infrastructure and services' (9.3%) refers to aspects such as inadequate service delivery, for example irregular removal of household waste by the municipality. The dimensions with the lowest frequencies 'informal settlements' (8.5%) and 'image' (0.8%) are self-explanatory as they respectively relate to the appearance of and living conditions in informal settlements and the images portrayed about Okahandja in the media as well as the associations 'outsiders' make between the poor aesthetic appearance of Okahandja and its residents. The constituents of these dimensions are opt to lead to negative place images which can adversely affect feelings of attachment.
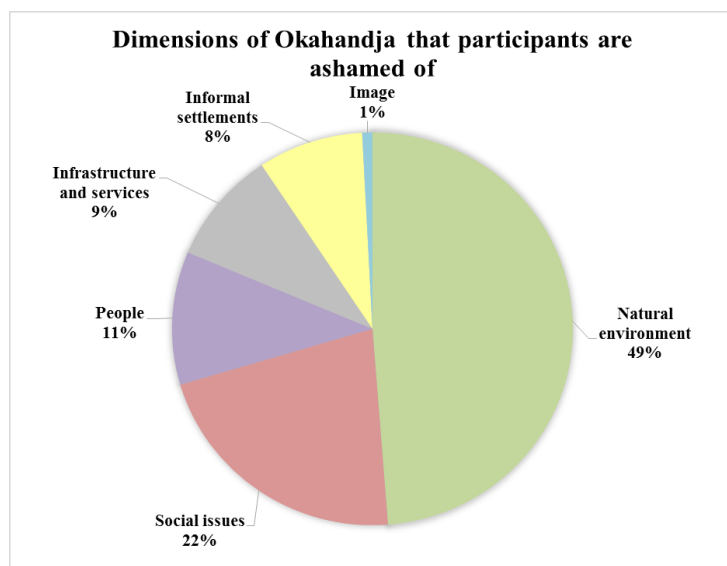


Source: Survey questionnaire

Figure 4.14 Dimensions of Okahandja that participants are ashamed of

The next subsection provides a summative and comprehensive view on participants' place attachment, how they experience Okahandja and the meaning they assign to the town. These aspects are discussed in relation to PEB.

### 4.5.5   Applying Gustafson's model of place meaning

Gustafson's (2001) meaning model is applied in this section to make further sense of the participants' attachment to Okahandja. Application of the model highlights the meanings participants associate with Okahandja and also provide some explanations for the environmental

problems encountered in the town. The model is based on the self-identification and emotional involvement of the individual (self), the traits and behaviour of other people (others) and the physical characteristics and features of a place (environment) (See Subsection 2.5.3.2). The expositions are set out below according to the interactions between the three poles of self-others-environment.

(i) *Self*. When most of the participants took part in this study they were in their adolescent life stage so that Okahandja was already a significant part of their developmental and emotional growth. During this stage identities are moulded and constructed by internal and external influences which might cause individuals to draw stronger associations with place compared to those in other phases of their life. Devine-Wright & Clayton (2010: 267) aver that "our identities are shaped by the experiences we have with both social and nonsocial stimuli, the people and places that we encounter, and these identities affect our responses to new events." Sampson & Goodrich (2009: 913) argue that even though an individual's identity with place is individualised in its interpretation, "it draws on a collective set of values, behaviours, and actions that are embedded in shared community practices." Communities therefore provide the filter through which individuals can develop identity with place (Sampson & Goodrich 2009; Stedman 2003). Consequently, the life stage in which participants were when been involved in the study might significantly impact on their identity formation, decision making and the role models they choose to be influenced by. Additionally, as all the participants were attending school in Okahandja it plays a crucial role in their self-identification and self-efficacy. For many of the participants formal school is regarded as a mechanism of self-empowerment, of escape from the poverty trap and a vehicle for improving their current standard of living. Okahandja will also be associated as the place where many of them obtained their highest level of education.

(ii) *Self-others*. The findings of both the questionnaire survey and the focus group discussions made it apparent that this dimension is an essential component of Okahandja's place meaning. A strong sense of community, social interaction and collectivism within the communities was identified rooted in the importance of support from friends, neighbours and community members. The attachment seems to be directed toward others so creating a socially based place bond. Participants also recognised themselves in community structures and operations by using statements such as "we stand as one" and "everyone knows each other". Concerning PEB, Uzzell, Pol & Badenas (2002: 28) note that "socially cohesive communities that have a strong sense of social and place identity will be more supportive of environmentally sustainable attitudes and behaviours compared with those communities in which cohesiveness and social and place identities are weaker." While the social cohesion (between residents) in Okahandja is

strong, participants' place attachment was moderate which may influence their desire to behave pro-environmentally. Furthermore, a disconnect was identified between Okahandja residents and local municipal authorities. There seems to be a high degree of miscommunication due to conflicts of interest that cause a lack of cooperation, trust and unity. The distrust and separation between residents and municipal officials was identified as a major stumbling block to the manifestation of PEB because individuals' willingness to partake are compromised. During the focus group discussions, participants made the following comments: "If I clean it today, it will be dirty tomorrow. We wait for the municipality to clean it, our parents tell us that the municipality just want money and don't do anything" and "We will not help to clean, we will be quiet so that it can be dirty and then someone important like the mayor of Okahandja will see that they (the municipality) are not doing their job." An individual might possess PEB knowledge and attitudes and want to contribute to environmental protection but mistrust in local authorities can obstruct the execution of PEB. It seems as if participants feel that municipal officials will be given undeserved credit should they contribute to environmental clean-ups in and around Okahandja. The lack of participation and cooperation by Okahandja residents can be viewed as a form of dissatisfaction with and protest against structural opportunities, such as proper service delivery. A level of social resistance is being experienced between residents and municipal officials which is detrimentally affecting the environment. Grønhøj & Thøgersen (2012) found that young people do not consider themselves as the first line of defence against environmental degradation and tend to hold the government and other people responsible for environmental protection before they reckon themselves to be responsible.

(iii) *Environment-self.* Given the median of 3.5 in the summated index of the place attachment statements and that there was wide disagreement with the place attachment statement "If given a choice to live anywhere, I would choose to live in Okahandja" the participants' attachment to Okahandja is not necessarily firm. Despite their strong sense of community and social cohesion, participants did not seem to identify with or be strongly attached to Okahandja. This lack of a strong place attachment may contribute to a weaker sense of responsibility towards the environment. Stedman (2002) noted that individuals who strongly identify with a particular place may act on behalf of others to mitigate existing problems and/or they avoid negativity that might prevent change for the better. The participants do, nevertheless have some degree of emotional affiliation with Okahandja. Some identified access to proper schooling as being important to improve their lives and others cited the significance of the cultural and historical value of Okahandja. This confirms that the meaning of a place does not merely refer to the physical environment, but also as the "symbolic or historical environment" (Gustafson 2001: 11). The

lack of opportunities and institutions in Okahandja were viewed as a major constraint causing high unemployment rates and low standards of living. Stedman (2002) found that when individuals have a high degree of place attachment and low level of place satisfaction their willingness to engage in place-protective behaviour increases. This study of Okahandja measured a relatively weak place attachment and a notable low place satisfaction which possibly account for the limited interest in engaging in PEB. The participants felt that tourism is not a top priority because tourists seldom stopover in Okahandja but merely drive through and spend their money elsewhere. The participants highlighted that because so few people (even none) from the poor socio-economic communities in Okahandja directly benefit from tourism, they shrug off the importance of a clean and protected environment for tourism.

(iv) *Others.* The inhabitants of Okahandja are not a homogenous group and often categorise themselves according to where they live and their socio-economic status. The participants more likely associate themselves with people from the same residential area because they can relate with one another's living conditions. While a strong sense of community cohesion was identified, they stressed the high level of carelessness and the negative attitudes toward active environmental protection among 'other' community members. Comments like 'people don't care' and 'people are lazy' were often heard during the focus group discussions. Their perceptions of the local municipality and its officials were frequently mentioned, namely unethical practices, laziness, ineffective service delivery and abuse of power and authority. Participants often referred to 'us' (Okahandja residents) and 'them' (municipal officials) to convey their disagreement and dissatisfaction.

(v) *Others-environment.* Certain environmentally detrimental practices such as littering and the burning of litter and refuse, were identified as 'habit' and a 'culture' in the communities. These behaviours seem to be expected and are the norm in Okahandja. During the discussions an Ovambo girl commented that: "Certain behaviour is not tied to a specific ethic group, any person from any ethic group can behave like that. Everyone just follows other people's example." Okahandjans believe that an individual's behaviour is not worsening the conditions, but merely adding to existing problems. Stern (2000) maintains that habit, as settled or regular practice, is a key causal variable in PEB. Unfortunately, in Okahandja poor habits have been established that cause residents to behave without any cognitive consideration of the consequences of their actions. Although most of participants singled out the importance of Okahandja being a clean town and also felt strongly about environmental protection, a sense of helplessness made them feel overwhelmed by the situation and the magnitude of the problem. This impotence causes individuals to conform to the behaviour and expectations of community members, thereby

overshadowing any individual attempt to contribute to environmental protection. To express their feelings about this situation, participants often referred to the idiom "If you can't beat them, join them." Blake (1999) argues that individuals often abandon their responsibility to control their behaviour and actions because they feel that their efforts lack efficacy and that acting on their own makes no difference. In Okahandja the strong community cohesion and collectivism found among members can worsen the problem as they influence one another by collectively deciding to adopt certain behaviour and choices. The extent to which one imitates the behaviour of others is dependent on who the other individuals are and how similar they are to oneself (age, personality, attitudes) (Grønhøj & Thøgersen 2012). In addition to this collective conformity, Uzzell, Pol & Badenas (2002: 49) point out that "People depend on the cooperation of others. The extent to which people believe that others are willing to help solve environmental problems is an important influence on their own willingness to change." One can conclude that many of the participants' desire and willingness to participate in PEB are influenced, even obstructed, by peer networks and community members.

(vi) *Environment.* Some participants did refer to the historical and touristic significance of Okahandja. But in their opinion tourists simply stop for fuel and refreshments before travelling on, so denying the town's tourism potential. The negative publicity about the dirtiness of the town and its poor governance can cause residents to accept these as the norm which leads to Okahandja being identified and labelled as a specific 'type' of place.

(vii) *Self-others-environment.* This involves all three poles working together including traditions, events and festivals like the annual Red Flag Day parade and the Tourism and Trade Expo. Other events that might incorporate all three poles are environmental clean-ups and community meetings that could bring about consensus among all parties involved. A Herero focus group discussant remarked that "a solution to the (litter) problem is to organise a campaign to clean up and provide a reward such as bringing communities together, braaiing and having fun."

The whole section on place attachment and this application of the Gustafson (2001) model to Okahandja provide evidence of the relationship between place attachment and PEB being complex and seldom clear-cut. Four findings about place attachment and PEB stand out. First, participants showed a moderate attachment to Okahandja. Despite their social and environmental problems, participants from Vyf Rand Camp informal settlement reflect the strongest place attachment. Second, great emphasis was placed on social cohesion and strong community bonds. These aspects are liable to cause people to conform to the behaviour of others which can lead to further environmental degradation. The social pressures in and norms of the communities

seemed to overshadow individual responsibility and commitment. Third, the natural environment is a dimension participants felt ashamed about, but at the same time they demonstrated little interest in contributing to solutions because of social resistance and mistrust between residents and local authorities. Fourth, an individual can display different environment behaviours across different geographical areas due to differences in place attachment and community collectivism. The next section turns to the environmental behaviour of individuals.

## 4.6 ENVIRONMENTAL BEHAVIOUR

This section reports participants' willingness to partake in environmental protection behaviour. Three out of four participants (74.5%) indicated that they would keep an empty packet of chips in their possession rather than throw it on the ground if there is no rubbish bin in sight. One survey participant was willing to throw an empty chips packet on the ground but regarded it unacceptable to throw a plastic bag in the street. On being questioned about this he answered: "The empty packet of chips is small and will easily 'disappear' compared to the plastic bag." This illustrates the obscurity of their reasoning. Similarly, 84.3% indicated that they would immediately close a running tap in the school bathroom and the other 15.7% reasoned it is not their concern or they do not even think about it. These findings are conflicting with observations made by the researcher in the residential areas and on the school premises (Chapter 1). The discrepancies between actual behaviour and self-reported behaviour are attributed to two sources. Firstly, there can be major inconsistencies between self-reported and actual behaviour. Bogner & Wiseman (1997) describes this well-known paradox in terms of social desirability when individuals express their future behaviour in terms of expectations or what one 'ought' to say rather than verbalising one's true actual behaviour. Second because the questions were not site-specific, discrepancies are possible between responses and observations.

Moreover, two out of three respondents (65.8%) agreed (or strongly agree) that they are willing to participate in environmental clean-ups in and around Okahandja, while only 49.1% pointed out (agree or strongly agree) that they are willing to take a cloth shopping bag to the supermarket rather than taking a free plastic bag because the former behaviour would prevent pollution. Despite this being a simple and low-cost behaviour that creates little discomfort or requires little effort, less than half of participants indicated that they are willing to apply the environmentally-friendly behaviour to their daily routines. The remaining participants were unsure, hesitant or unwilling. Apart from their willingness to contribute and implement environmental protection measures, this may also indicate their low level of belief that appropriate individual behaviour will make a difference to the greater picture. When questioned in the focus groups, participants

confirmed that environmental-protecting actions are too much of an effort and too expensive, that they are unwilling to experience any discomfort or make to an effort at the cost of their own time, convenience or money and that they just want to get rid of the problem (litter) despite the consequences on the environment. Research has suggested that people will only participate in PEB when it does not involve costs such as time, money and discomfort (Diekmann & Preisendörfer 1998; Hunter, Hatch & Johnson 2004).

Regarding saving energy three out of four (74.8%) indicated that their families do something to save energy. Most mentioned switching off lights and unused appliances, and using firewood for cooking purposes when asked what they do. This high response about saving energy led to the question: "Do you think about the effects your daily interactions might have on the environment?" for the discussants. Damara and Herero participants felt strongly about the monetary costs involved in the using and wasting of electricity and water whereas Ovambo participants referred to both environmental protection and the expenses involved. An Ovambo male commented that "I don't want my parents to pay but if it is free I will not care." Urban & Ščasný (2012) reported that economic factors such as saving money on energy bills are often used as motivation to save energy while environmental motives and convenience are mentioned less. Participants (and their families) seem to engage in PEB primary for gain (e.g. to save money) while hedonic and normative reasons for PEB are lacking (Steg et al. 2014). This might apply in Okahandja where the participants displayed concern about changes in their resource base. They also seem unwilling to use their resource base as a support mechanism to PEB. They also do not view their contributions as significant (normative reasons) and regard PEB as an effort and not necessarily enjoyable (hedonic reasons).

Another factor that surfaced during the discussions is that participants felt differently about their behaviour in their own personal spaces compared to public spaces. One participant commented: "People only care about their own houses and yards because they pay for it and people associate them with it – their own character and self-worth are involved." This is illustrate in the photographs taken of much polluted residential areas (Chapter 1). While waste heaps surrounded communities, individuals' private property was clean and well-looked after (cf Figures 1.10, 1.13c and 1.13d). Hunter, Hatch & Johnson (2004) found that women and men from less wealthy nations are more likely to express private environmentally-oriented behaviours compared to public behaviours.

Participants wish to experience minimal discomfort and expenses, so making PEB less attractive. Their low socio-economic status however, causes them to focus on saving energy so that they

can save money. Apparently, they behave more pro-environmentally in private spaces than in public spaces because their behaviour is tied to their self-worth and the perceptions others have of them. Therefore, the inability to accept responsibility, the lack of ownership over public property and the lack of cooperation to bring about positive change are major constraining factors that hinder effective environmental protection in Okahandja. In Subsection 4.6.1 participants' stance on the acceptability of littering is discussed.

### 4.6.1  Acceptability of littering

The majority (91.1%) of respondents admitted that it is unacceptable to throw a plastic bag in the street and their explanations for their responses are given in Table 4.2. A possible reason for littering that does occur is the perception that littering contributes to job opportunities as quite a large proportion (53.2%) of participants believed that littering does contribute to job creation. One respondent intoned that: "More and more people are picking up litter, first there was one person now five." This is particularly important in a town where unemployment is high and people are struggling for survival.

Table 4.2 The acceptability or not of littering

| Why littering is unacceptable | Why littering is acceptable |
|---|---|
| • Littering causes permanent damage. Bacteria breed in dirty places and diseases occur the more you litter.<br>• Litter makes the environment dirty and cannot decay causing problems to the environment and ecosystem.<br>• It makes the environment dirty and shows your way of living.<br>• It is called littering and is making the town untidy. It also chases the tourists away.<br>• We need to keep our environment clean and to ensure good health of our communities.<br>• Street children under 3 may play with plastic bag without control which may lead to death.<br>• There are animals that can eat the plastic bag and it will harm them.<br>• It shows disrespect to the person that created the world, God.<br>• Throwing a plastic bag will encourage other people to do the same and will make our environment dirty. | • It is not yours why should you care about what happens to the plastic.<br>• It creates jobs for people.<br>• Then the government can do something.<br>• So that the rubbish truck can see it and pick it up.<br>• There are no strict rules and the streets are already dirty.<br>• Everyone does it and no one can stop me from doing it.<br>• No one owns the streets.<br>• We don't have time to throw the plastic in a bin. |

Source: Survey questionnaire

From Table 4.2 it is clear that participants were aware that littering is unacceptable and they were also well-abled to identify why littering is unacceptable. The fact that littering persists despite participants' knowledge and awareness on this issue is worrisome. Similarly to Subsection 4.4.1 on the reporting of the importance of teachers and PEB and pro-environmental attitudes, Subsection 4.6.2 highlights the importance of parents in the establishment of environmental values and environmental behaviours.

### 4.6.2   Parents as role models for environmental behaviour

Parents teach and instil knowledge, values and beliefs into their children (Damerell, Howe & Milner-Gulland 2013). While only 17.1% of the participants noted that their parents tell them the most about the conservation of the natural environment, the influence of parents (and family) on young people's environmental reasoning and behaviour should not be underestimated. Children can be taught directly and/or indirectly as parents act as role models (Grønhøj & Thøgersen 2009). Grønhoj & Thøgersen (2012) argue that adolescents may be strongly influenced by their parents' norms because they are and have (usually) always been part of their immediate surroundings. It was found that young people's attitude and interest toward PEB are strongly influenced by family members' values and behaviours (Cheng & Monroe 2012; Kals, Schumacher & Montada 1999). It is noteworthy that some of the participants (11.3%) who answered that littering contributes to job creation in Okahandja stipulated that their parents told them so. In this case parents negatively influence the future societal development by motivating the wrong environmental behaviour. Discussants in the focus groups made reference to their parents and family members as role models. Two female participants made the following comments: "I follow my grandmother's example; her house is very clean as well as her surroundings. My father does not care" and "I don't waste water because my grandmother told me not to waste water because other children don't have." Despite the pro-environmental outlook by female role models in participants' lives, some participants (mostly males) explicitly indicated that they would rather follow the behaviour of male adults because of their social and formal decision-making power and standing in society, making certain unlawful behaviours acceptable.

Grønhøj & Thøgersen's (2009) investigation of the intergenerational transmission of environmental values, attitudes and behaviours found that environmental orientations are transmitted from parents to their children. In the Okahandja population, what parents say, think and do seem to influence their children as they use it as a guideline to distinguish between appropriate and inappropriate environmental behaviour. Many of the children's parents are illiterate and did not necessarily have access to EE during their childhood so that their levels of

environmental knowledge, awareness and skills are low, therefore influencing their environmental behaviour. For this reason, EE campaigns should emphasise the importance of parents and family as role models in the lives of young people.

Most participants were well able to identify why littering is unacceptable, whereas those who considered it acceptable behaviour argued from a protest point of view. The importance of parents and family members to instil pro-environmental values, attitudes and behaviour was confirmed during focus group discussions. The findings reported in this section reconfirm the study's other findings, namely the participants are relatively well-informed about the effects inappropriate environmental behaviour have on the biosphere, geosphere, hydrosphere, atmosphere and economy. In Section 4.7 participants' general environmental concern and environmental worldview are discussed.

## 4.7 ENVIRONMENTAL CONCERN

Environmental worldview, often referred to as ecological worldview, relates to a person's underlying ecological orientation (Boeve-de Pauw, Donche & Van Petegem 2011; Corral-Verdugo & Armendáriz 2000; Dunlap 2008; Fransson & Gärling 1999; Starik & Rands 1995). This worldview is influenced by deep-rooted values, attitudes, concern and beliefs (Corral-Verdugo & Armendáriz 2000; Fransson & Gärling 1999; Van Petegem & Blieck 2006). This research holds environmental worldview to be an umbrella term describing how individuals view themselves in the environment. This section turns first to investigate the survey participants' general environmental concern (4.7.1 to 4.7.4) and then their environmental worldview.

### 4.7.1   General environmental concern

Section C of the questionnaire appraises the general environmental concern of the participants. It was found that the respondents have strong environmental concern with some 95% explicitly indicating (agree or strongly agree) that the country's natural resources must be protected for future generations and 79% stipulating that any pollution they cause affects the health of the natural environment and is therefore important to them. Likewise, 90% felt that Namibian schoolchildren should support the conservation of the natural environment. As with place attachment, a summated index was created. A standard reliability and item analysis of this index yielded a Cronbach's alpha coefficient of 0.71 in STATISTICA. The inter-item correlations between the items and the sums score are between 0.3 and 0.6 indicating that the items (general environmental concern statements) accurately measured the same construct (general environmental concern). This resulted in a median of 4.5 on a Likert scale of 1.0 (strongly

disagree) to 5.0 (strongly agree). This means that most responses were around 4.0 or 5.0 (i.e. agree strongly or agree). These collective responses are illustrated in Figure 4.15. Given the high-rated scores on individual statements, the summed index prominently indicates a high degree of environmental concern as the histogram strongly leans towards the right. Only few respondents measured low on the scale (1.5 to 3.0) as indicated by the outliers in the histogram. It emerges that the participants do care about environmental quality and are concerned about the threats an unprotected environment might pose on the environment and/or the well-being of people.
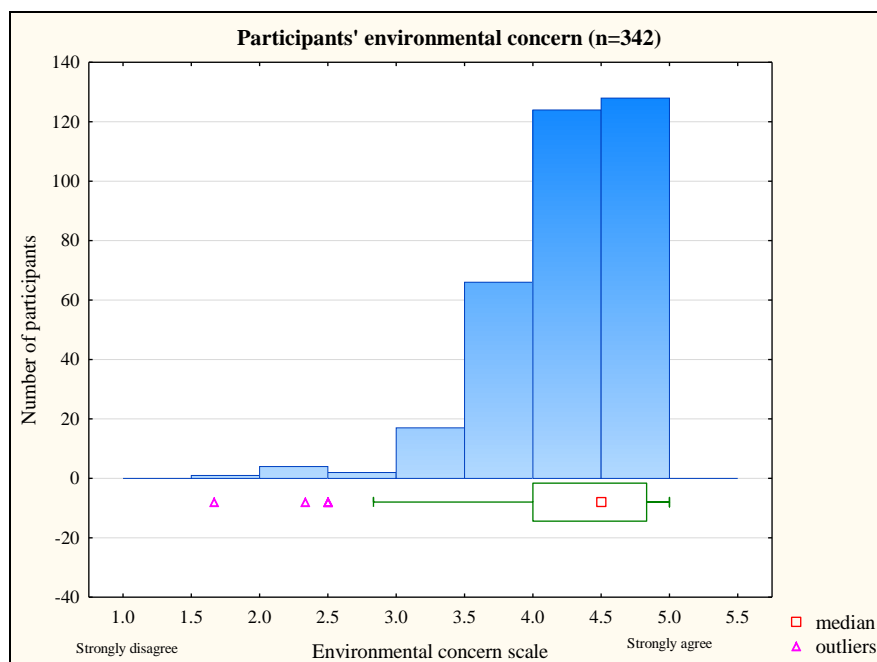


Figure 4.15 Summary of the general environmental concern scale

The summated index of general environmental concern was created to gain a collective perspective on participants' environmental concern and for analysis with other sections. In Subsection 4.7.2 the general environmental concern of males and females in the sample population is discussed.

### 4.7.2   General environmental concern according to gender

One-way ANOVA was used to determine the environmental concern of males and females (Figure 4.16). This resulted in a p-value of 0.02, indicating that the genders' environmental concern does differ significantly: the female participants are more concerned about environmental matters than the males. This is consistent with the findings of various scholars (e.g. Dunlap & Van Liere 1978; Franzen & Meyer 2010; Mainieri et al. 1997; Tindall, Davies & Mauboulès 2003; Zelezny, Chua & Aldrich 2000). Higher levels of environmental concern

among females are often ascribed to the tendency of females to be protective, nurturing and caring (Beutel & Marini 1995; Chen 2005; Eagly 1987; Gilligan 1982; Zelezny, Chua & Aldrich 2000; Xiao & Hong 2010). Females as childbearers and caretakers tend to embrace a worldview based on concern for life and relationships (Hunter, Hatch & Johnson 2004; McStay & Dunlap 1983). Geller (1995) proposed that altruism (active caring) can motivate PEB while Allen & Ferrand (1999) argue that sympathy is a significant predictor of environmental protection. The role of females is also evident in policy development, environmental activism and political leadership (Zelezny, Chua & Aldrich 2000).
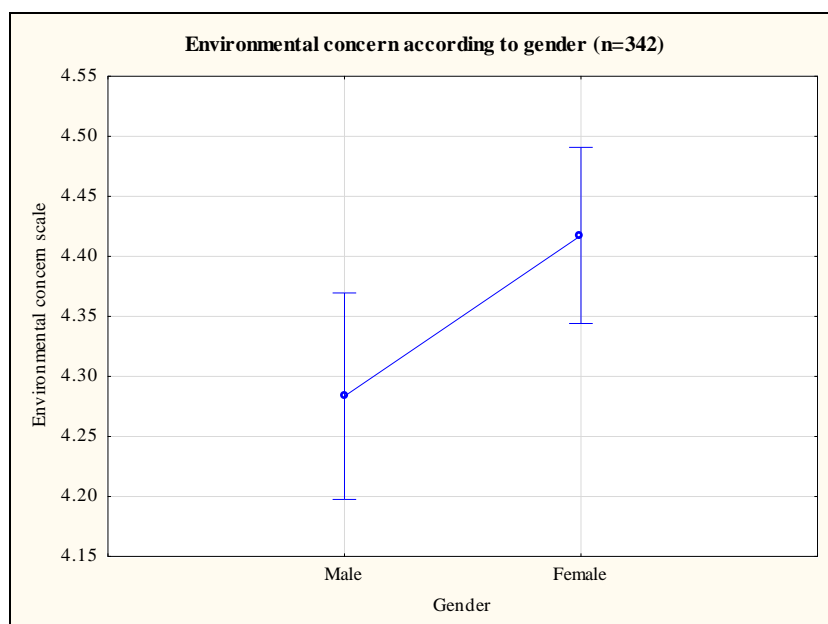


Figure 4.16 General environmental concern according to gender

Consequently gender can be used as a reliable predictor of environmental concern among Okahandja's youth. In the next subsection the general environmental concern of the different ethnic groups is explored.

### 4.7.3    General environmental concern according to ethnic group and area of residence

One-way ANOVA was also used to determine if the environmental concern of ethnic groups differ. A p-value of 0.05 was generated, indicating a significant difference between members of different ethnic groups and their environmental concern. Sub-hypotheses were compiled through a Fisher's LSD test. The letters 'a', 'b' and 'c' were used to illustrate the differences between the groups. Figure 4.17 illustrates the similarity and differences between the environmental concern of the different ethnic groups involved in the survey. Ovambo participants were found to have the highest environmental concern while Coloured participants displayed the lowest. Ovambo,

Damara and Other participants' environmental concern did not differ significantly and Herero, Coloured and Other participants' environmental concern did not differ significantly.

Although the environmental perceptions and concern of different ethnic groups in Namibia have never been investigated, a possible explanation for the differences reported here can possibly be linked to the differences in their socio-economic status, living conditions and livelihoods. Because most of the Ovambo participants (80% of participants living in Vyf Rand Camp are Ovambo) live in areas where severe environmental problems are part of their daily lives, their environmental concern is higher. However, one-way ANOVA used to determine the relationship between residential area and environmental concern resulted in a p-value of 0.46 which indicates that no significant difference exists. General environmental concern does therefore not seem to differ significantly across geographical areas (within Okahandja), albeit it was expressed by all participants. This is probably ascribed to very similar environmental problems and challenges being faced in almost all the residential areas, so threatening the well-being of all communities and the natural environment.
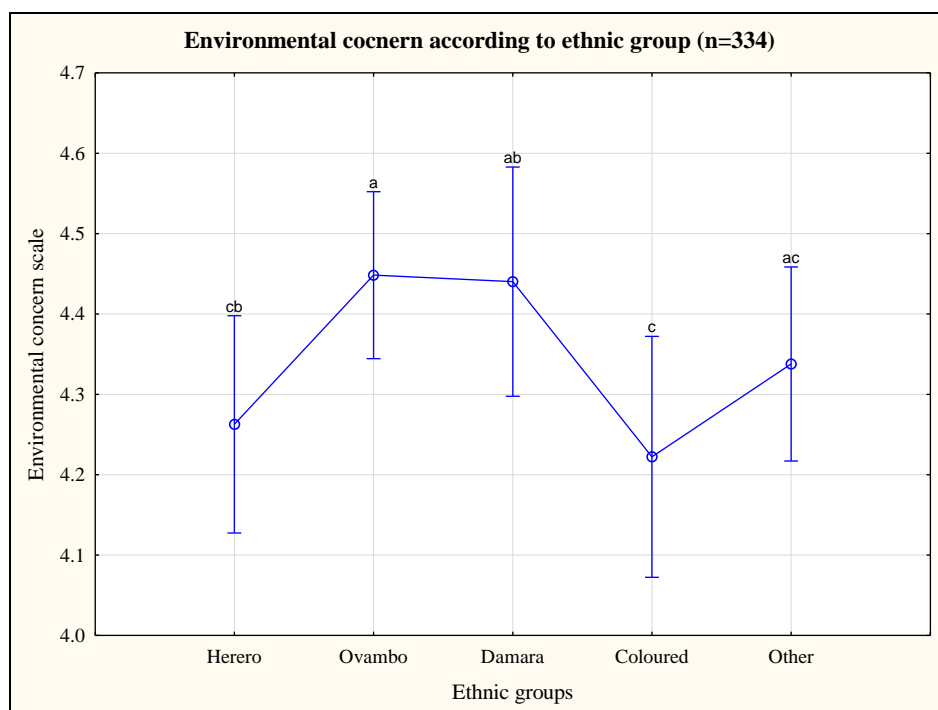


Figure 4.17 Environmental concern according to ethnicity

Subsection 4.7.4 reports on the possible link between environmental concern and PEB.

### 4.7.4   The link between general environmental concern and PEB

One-way ANOVA produced a non-significant result (p-value 0.49) when the environmental concern of individuals who indicated that after eating a packet of chips they would throw the empty packet on the ground because no rubbish bin was in sight, was compared with those who

said they would keep it in their possession until they found a rubbish bin. While a significant difference (p-value <0.01) was found between the environmental concern of individuals that felt it was acceptable to a throw a plastic bag in the street and those who answered that it was unacceptable. Similarly, individuals who indicated that they would immediately close a running tap in the school bathroom scored higher on the scale of environmental concern, but only few participants indicated that they would leave it as it was of no concern to them or not think about it, the statistical difference is small (p-value 0.04). Respondents who indicated that they (and their families) do something to save energy scored higher on the environmental concern scale (p-value 0.02) compared to those who indicated no verbal commitment to energy saving (Figure 4.18). These results indicate that there is a relationship between environmental concern and self-reported environmental behaviour. Even though one expects individuals with higher levels of environmental concern to more likely engage in environmental protecting behaviour, research has shown that environmental concern is a poor predictor of (actual) PEB (Ajzen & Fishbein 1977; Ajzen et al. 2011; Cleveland, Kalamas & Laroche 2005; Uyeki & Holland 2000). The complex nature of environmental concern allows some behaviour to be predicted by it whereas some aspects of environmental concern only influence specific environmental behaviour (Cleveland, Kalamas & Laroche 2005).
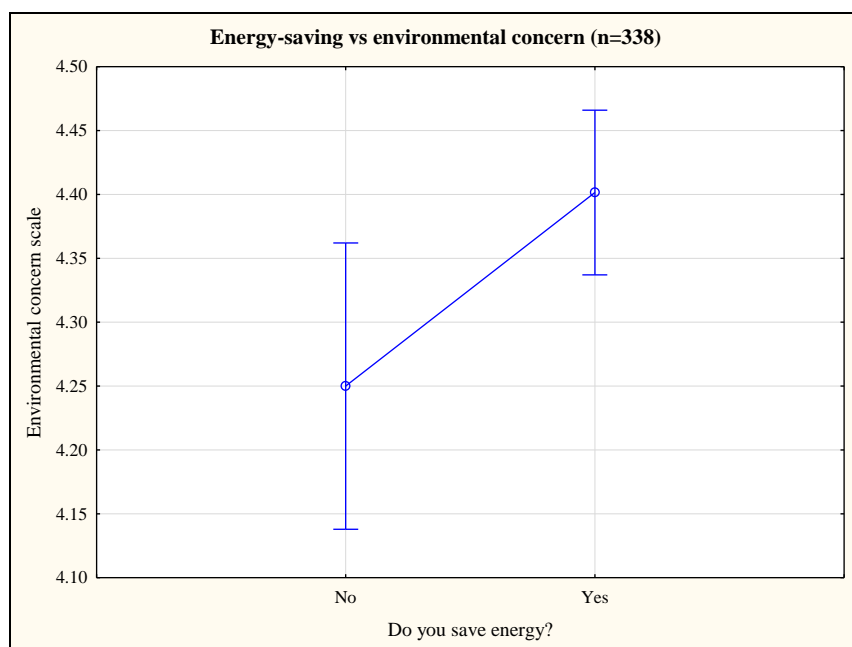


Figure 4.18 General environmental concern and commitment to saving energy

Bamberg (2003) reasons that there is only a weak relationship between environmental concern and behaviour because it is assumed that general attitudes (such as concern) influence specific behaviour. The linkage between environmental concern, self-reported behaviour and actual behaviour is intricate and dependent on the situation, values and norms. In Subsection 4.7.5 the

next segment of the participants' environmental concern, namely their environmental worldview is investigated.

### 4.7.5   Environmental worldview

To measure participants' environmental worldview, NEP scale items were used to obtain an understanding of the relationship between participants and the environment. However, a criticism against the NEP scale is that it is a poor predictor of environmental behaviour due to the weak relationship between broad attitudes and specific behaviours (Dunlap 2008; Gardner & Stern 1996; Scott & Willits 1994; Weigel & Newman 1976). But some scholars (e.g. Casey & Scott 2006; Olli, Grendstad & Wollebaek 2001) found that the NEP was a useful predictor of both actual and self-reported behaviour. The discussions that follow deal with two dimensions of environmental worldview, namely limits to growth and anti-anthropocentrism.

4.7.5.1 Limits to growth

This dimension focuses on the beliefs that the balance of nature is being threatened by human activities and that there are limits to human economic growth and development. Two major contributors to limits of growth are population growth and excessive consumption (Waggoner & Ausubel 2002). The majority (60%) of participants agreed or strongly agreed that the earth is like a spaceship with very limited room and resources. Furthermore, their belief that resources are limited was supported by discussants in the focus groups when frequent reference was made to the importance of preserving resources for future generations. An Ovambo female discussant made the following comment: "In the North children get schooling in tents and there are no taps. I will close the tap because there might not be enough water in future and other children don't have." This can be linked to the argument on awareness of place (Section 4.3) and the scenario of the tap left running in the school bathroom. This girl had travelled outside her geographic region of residence and experienced environmental problems and scarcity of natural resources elsewhere giving her a wider variety of 'comparative mental landscapes' that enable her to make more informed decisions. A Damara participant commented that he does not want the natural environment to disappear but has a desire for new developments with the hope that they will improve their standard of living. It is the researcher's belief that people will only resist economic growth and development once their daily needs have been satisfied. Therefore, the realisation and supporting of limits to growth may only be achieved when individuals are able to sustain themselves. This notion is discussed further in Chapter 5.

4.7.5.2 Anti-anthropocentrism

According to Fennell (2006: 190) anthropocentrism "posits that nature can only be conceived from the perspective of human values", while ecocentrism "considers that all things in the biosphere have the right to exist equally." Anti-anthropocentrism removes the idea that humans are superior to the natural environment and that only humans have independent moral value. Most participants (79.7%) agreed (or strongly agree) that humans are as much part of the natural environment as animals. Similarly, 93.3% agreed that humans need the natural environment to survive. Despite these high levels of agreement that we are part of and need the natural environment, fewer (65.2%) agreed that humans have the right to change the natural environment to suit their needs, and even fewer (54.1%) indicated that we are meant to rule over the natural environment. The strong sense of human dominance over the natural environment caused a lowering in their NEP scores. This is consistent with the findings by Van Petegem & Blieck (2006) who found that Zimbabwean children emphasised the use of natural resources to fit human needs. The sense of human dominance might be linked to some of the Okahandja participants' experience with collecting and harvesting natural resources and products and their beliefs that a balance is required between environmental protection and the simultaneous satisfying of human needs. This is a well-known phenomenon, especially in African countries. Monela et al. (1999) provide an example of some rural villages in Tanzania where 60% of the inhabitants' income is derived from natural resources such as wild fruits and fuelwood. There is must evidence in the literature suggesting that non-industrialized and indigenous societies tend to believe in the connection and balance between humanity and nature. Not surprisingly, Africans' worldviews are largely grounded in normative and pragmatic bonds with nature (Millar 1999). Some scholars found that human advancement and well-being is a central construct of environmental concern among Africans (Callicott 1994; Kelbassa 2005). Rather than classifying the Okahandja participants' ecological orientation as anthropocentric or ecocentric, participants seem to support a balance between protecting the environment and satisfying human needs. This fits more neatly into a sustainable development framework (Corral-Verdugo & Armendáriz 2000).

This discussion of participants' general environmental concern and worldview established that participants are concerned about the environment; they do regard environmental protection as important; and they understand that humans are dependent on the natural environment. Because not all their material and basic needs are met, they concentrate more on their livelihoods than people living in developed countries. Poor people may show greater concern about and protest against environmental degradation because their health, livelihoods and natural resource base are

threatened (Dunlap & York 2008). While statistical significant differences were found between the environmental concern of ethnic groups, the reasons are uncertain. Finally, it appears that when individuals are exposed to or affected by environmental degradation, they are more likely to demonstrate high levels of environmental concern compared to those who have had little to no exposure to environmental decay.

## 4.8 CONCLUSION

In this chapter, selected environmental behaviour factors were discussed to gain an understanding on the influences and factors that play a role in participants' decisions about environmental behaviour. Six findings merit repeating here. First, participants seem to have a close and dependent relationship with the environment as many of them still rely on resources such as firewood and natural food sources for sustenance. Second, relatively high levels of environmental knowledge and awareness were recorded throughout as participants displayed well-informed insights. Third, place attachment and the meaning people derive from places seem to play a crucial role in the way participants behave in Okahandja. Participants indicated that they would behave differently in places with which they associate themselves or feel proud of. Fourth, participants seem to possess multiple identities across different contexts as they act in response to social motivations. Fifth, female and Ovambo participants displayed the highest levels of environmental concern. Sixth, environmental behaviour was found to be erratic, difficult to predict and influenced by an array of factors. This includes factors such as socio-economic status, values, the influence of role models, place attachment and environmental behaviour motives.

In the next chapter the participatory art drawings are analysed and discussed to complement the findings reported in this chapter and to offer views of the participants' current and ideal future images of Okahandja.

# CHAPTER 5 RESULTS AND ANALYSIS: AN OIL PASTEL FOR YOUR THOUGHTS

## 5.1 INTRODUCTION

Landscape consists of places which have a strong existential meaning for people (Antrop 2004). This meaning people tie to landscapes is influenced by experiences connected to places and their environment (Matthews & Limb 1999). Human geography is not only concerned with where a place is but also the feelings people associate with a place (Kaivola & Rikkinen in Eija, Elisabeth & Varpu 2012). Strong feelings toward a place may engender strong affections for certain landscapes. A place can be described from the perspective of an insider or an outsider's outlook (Eija, Elisabeth & Varpu 2012). This chapter describes attempts to visualise – by participatory art drawings – the way in which secondary-level schoolchildren (as insiders) think and feel about Okahandja; to uncover the many facets of their relationship with their environment and; to interpret the meaning of their thoughts about their immediate environment. It also aims to add to the understanding of those aspects not covered in the previous chapter. This chapter first introduces the theoretical underpinnings of drawing as an arts-based method to understand the environmental perceptions of children; then explains the context of and procedures followed in the children's drawing/art project; and lastly discusses the researcher's distillation and observations made from examining the drawings (images) and talking to the 'artists' about their immediate environment. The results provide an alternative perspective on the way these children think about and experience their surroundings, their concerns and how they want their surroundings to change. This is complemented by and/or contrasted with an outsider's (the researcher) observations made during transect walks observations in the study area.

## 5.2 DRAWING AS AN ARTS-BASED RESEARCH METHOD

Children's drawings have been used in various disciplines and subject areas such as psychology, geography and art therapy as a means to obtain information on learning about and conceptions of place (Backett-Milburn & McKie 1999). Drawing is an enjoyable activity that is a powerful tool for evaluation purposes because of its unique ability to obtain information from children or adults without creating tension (Barraza 1999; Lewis & Greene 1983). Drawing also eliminates linguistic barriers enabling comparisons of groups of different backgrounds (Chambers 1983). Bowker (2007) argues that because children are complex and unique individuals with rich thoughts and feelings they can produce drawings that provide insight into their cognitive and social development. Vygotsky (1971) not only viewed art and thinking as being closely

connected, but argued that art is also an advanced way of thinking. Children tend to draw what they know about, what they experience in their daily lives and what they regard as important to portray and communicate with others (Bowker 2007; Walker, Myers-Bowman & Myers-Walls 2003; Willats 1977). Moreover, the pictures children draw can be used to understand the challenges the children face, their perceptions, experiences and interests. Kitahar & Matsuishi (2008: 10) reason that "the extent to which a child is conscious of the surroundings, in other words, the breadth of the child's world vision has a great influence on the contents of the drawing." Art can therefore be seen as lived experiences transformed into transcended configurations (Van Manen 1990). During the picture-drawing process, children's thoughts and feelings are amalgamated and expressed through colours, shapes and lines (Malchiodi in Günindi 2012). Children carefully choose the materials, colours, size, patterns and position of what they want to draw (Farokhi & Hashemi 2011). Children's drawings are also a reflection of the lifestyle environment they are surrounded by, their skill sets and the education methods they are exposed to (Kitahar & Matsuishi 2008). When interpreting artwork, discursive prose illuminates the art by adding meaning to the art in question (Maxwell 2013). Therefore, art can be viewed as text that has its own grammar (Alerby 2000).

Scholars have used drawings to understand children's environmental perceptions (e.g. Aronsson & Junge 2000; Backett-Milburn & McKie 1999; Barrazza 1999; Eloranta & Yli-Panula 2005; Snaddon & Turner 2008; Yli-Panula & Eloranta 2011). Children's drawings are often used as emotional indicators for environmental problems and show children's attitudes towards environmental conditions. For example, Barraza (1999) analysed the drawings of 7- to 9-year old English and Mexican children to evaluate their environmental perceptions, expectations and concerns for the future. In the Barraza (1999) study children showed a deep concern for the environment as more than one in three depicted environmental problems such as pollution, deforestation and global warming. Environmental problems such as the throwing away of rubbish and polluted cities were dominant themes. Barraza (1999) reported that children belonging to a lower socio-economic class are more likely to depict environmental problems because of their exposure to them. Fleer (2002) asked 5-to 12-year-old children in Australia to draw their future environment and found that older children (aged 10 to 12) tend to produce negative images of their environment. In Sweden, Alerby (2000) used drawings to explore young people's thoughts about the environment. Older children (13 to 16 years old) were more likely to focus on dialectics between the 'good and the bad world' by drawing aspects such as littering on the bad side and a dust bin on the good side. Geographers have used children's drawings to investigate their 'ways of seeing' their surroundings (Matthews 1995). Matthews (1985) asked

children in Coventry (UK) to represent their journey to school and home by using free-recall mapping. An investigation of the spatial spread of information showed that with age children demonstrate an increasing awareness of the surroundings and everyday worlds. Bowker (2007) measured the change in children's perceptions and learning on tropical rainforests in Cornwall, UK through pre-visit and post-visit drawings. In Section 5.3 the application of participatory drawing in the case of Okahandja is discussed.

## 5.3 DRAWING PROJECT: OKAHANDJA SCHOOLCHILDREN'S VISUALISATION OF THEIR SURROUNDINGS

The subsections to follow (5.3.1 to 5.3.4) provide an in-depth explanation of how participatory drawing has been implemented into the study and how the drawings were analysed.

### 5.3.1　Revisit of study context and subjects

The children included in this study live in the municipal area of Okahandja and attend JG van der Wath Secondary School (state school). Most of the children are from lower-middle-class families. The municipal area of Okahandja has approximately 22 640 inhabitants. Okahandja is a medium-sized Namibian town, centrally located in the country. The town lies at the intersection of two major national roads and functions as a gateway to various tourist attractions in the northern and coastal parts of the country. Tourism is one of the five top contributors to the country's GDP and relies heavily on the abundance and distribution of wildlife and unspoilt landscapes (MET 2006). However, tourism is threatened by the quality of the environment. Overcrowding, erosion, litter, bush encroachment, loss of biodiversity, fire damage and veld degradation can seriously undermine the quality of the tourist experience, with a consequent decline in visitor numbers. Any drop in tourist income can affect the economic viability of the parks and conservancies. Clearly, environmental protection, keeping the environment clean and preserving aesthetic quality are vital to tourism. This case study of Okahandja aims to uncover how the surrounding environment 'local context' is constructed in the minds of young people. In the following subsections the didactic procedures, drawing assignment(s) (collection of empirical data) and analysis of the children's drawings (visual images) are explained.

### 5.3.2　Drawing assignment

A stepwise approach was followed to collect visual information and insights about the environmental surroundings of the children and to see how these children perceive their surroundings (everyday living contexts) and what they want their future surroundings to look like. The exercise required the children to complete the following drawing assignment:

1. Illustrate to someone who has never been to Okahandja what your town or neighbourhood look like now. What images come to mind when you think about your surrounding contexts in Okahandja?

2. Illustrate how you wish Okahandja will look in the future.

Using the above statements as instruction for what was required from the children Subsection 5.3.3 provides the didactical context.

### 5.3.3    Participants and didactical context

During school hours 110 children – conveniently selected[9] from grades 9 and 10 – took part in the drawing assignment. The drawings were completed during two 45-minutes sessions during Life Skills and Basic Information Science (library) periods to ensure minimal interruptions to the school programme. Drawing material in the form of an A3-size paper and coloured oil pastel crayons were provided to each child. The children were asked to divide the one sheet of paper into two parts: one to depict the present state and the other the 'dream Okahandja – a possible future state'. The children labelled each accordingly. As in Barraza's (1999) study, an open approach was taken. Rather than telling the children to illustrate specific environmental problems or solutions to environmental problems, they were left to see if they exemplify environmental problems and which environmental problems they chose to illuminate. The children were assured that there are no wrong or right depictions and they were encouraged to express their own viewpoints. The task was done in a relaxed atmosphere under supervision by the researcher. To grasp how the children translated their thoughts through drawing, they were also asked to 'describe their pictures'. This interpretive description was done by using the draw-and-tell technique. During the explanations notes were made of the individual drawings. The explanations were used to verify information and features portrayed in the drawings so avoiding misinterpretation by the supervisor. Some children used labels on their images to explain what they were trying to illustrate. The next subsection moves on to the analysis and interpretation of the drawings as a way to obtain an enriched understanding of what was portrayed in the drawings.

### 5.3.4    Systematic analytical approach: Making sense of the drawings

The drawing exercise was not intended to evaluate the children's knowledge or drawing abilities, rather the meanings of the drawings and the artists' thoughts while drawing. Before any analysis or interpretation of a drawing was made, attention was given to the first impression each drawing

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[9] Participants were conveniently selected based on the children's availability and the teachers' willingness.

produced to get a general feeling about the drawing and the drawer's subconscious world. As done by Alerby (2000), the drawings were analysed in a repeated and thorough manner by noting if the drawings portrayed thoughts about a cared-for environment or those about a degrading environment. Thereafter, visual content analysis and interpretative content analysis were used to scrutinise the two drawings separately. Traditional content analysis counts textual elements compared to interpretative content analysis that identifies themes and ideas that may or may not be counted or described (Giarelli & Tulman 2003). Examination of each drawing revealed specific 'content' of abiotic and biotic elements. Inspection of the drawings uncovered similarities, differences and trends that helped the evaluator to get a 'look and feel' of the main 'environmental issues' or 'messages' presented in different qualitative styles such as patterns, colours and structures. The scanning of the first drawing (present state) involved eight main categories (and 34 subcategories), namely (1) people, (2) plants, (3) animals, (4) abiotic elements (clouds, sun, hills, rainbows, and water), (5) built-up features, (6) dirty environmental elements, (7) clean environmental elements and (8) socio-economic issues. Seven similar categories (and 29 subcategories) were used to analyse the future state, i.e. (1) people, (2) plants, (3) animals, (4) abiotic elements, (5) built-up features, (6) clean environmental elements and (7) features of community cohesion. Günindi's (2012) coding of drawing elements was used as the frame reference and the categories were adapted accordingly. For both drawings, subcategories provided more detail on the 'content' or the drawn features. The coding was done based in a two-step process of first characterising items in the drawings qualitatively followed by a quantification of elements. The categories were not regarded only as individual phenomena but as interrelated and connected themes. All the drawings were photographed and converted to jpeg files for electronic viewing and analysis. In the analyses the content of the landscape was considered to be more important than the drawing skills exhibited or the 'artistic' quality of pictures, i.e. the surrounding environment as construed in the minds of the young people was paramount.

Apart from the content (or messages) of the drawings, other aspects such as colour, shape, size and frequency of elements were studied to assist and enhance the interpretations. The criteria (colour, size, height, frequency and symbology) used to interpret and evaluate the children's drawings were drawn from various studies as set out in Table 5.1.

Table 5.1 Criteria for evaluating and interpreting children's drawings

| Aspect | Substantive literature |
|---|---|
| Colour was a major consideration when analysing the drawings. Light and bright colours (warm colours) such as yellow, orange and pink typically represented good elements such as flowers, sunshine, rainbows and happiness. On the other hand, dark and neutral colours such as black and brown (cold colours) were typically used to illustrate dirtiness, dissatisfaction, agitation and pollution. Many children used scribbles of dark neutral colours and green to show contaminated spaces, rubbish heaps and polluted water sources. In the current-state drawings, yellow and light brown were typically used to illustrate dry grass while in future-state drawings most children used different shades of green to show the abundance of growing vegetation. | Burkitt, Barrett & Davis (2003); Burkitt, Barrett & Davis (2009); Cohen-Liebman (1995); Günindi (2012); Oğuz (2010); Schmidl-Waehner (1942) |
| The size of features in the drawings was a noticeable characteristic. The difference in size could be determined in relation to other elements and by comparing the size of features in the current-state drawings with those in future-state drawings. Similarly, height was used as an indication of projected or built-up features. This was mostly used for built structures such as bigger houses, shopping malls and high-rise buildings. | Aronsson & Andersson (1996); Berger (1995); Cherney et al. (2006); Schmidl-Waehner (1942); Wolf & Perry (1988 |
| Attention was also given to the frequency and reoccurrence of elements in a single drawing. Exaggerated repetition of elements with respect to others in the drawing was noted. This might highlight subconscious thoughts, feelings and actions the child regarded as important. | Bell & Bell (2008); Lark-Horovitz & Norton (1960); Malchiodi (1998); Thomas & Jolley (1998 |
| Symbology was also considered. This includes the use of the universal recycling symbol, scribbles to show the giving off of strong odours and arrows to illustrate motion of elements, for example a person littering was illustrated by a down-facing arrow. | Blanchet-Cohen, Ragan & Amsden (2003); Lark-Horovitz & Norton (1960); Wu (2009) |

Source: Researcher's literature survey

Each participant (child) had to draw two 'pictures' – a current and a future image – of Okahandja. The first drawing was used to evaluate the children's perceptions on the current state of Okahandja, to see if they depicted environmental problems, demonstrated specific concerns, and gave some indication of spaces that interested or concerned them in their local environment.

5.3.4.1 The current picture or image of Okahandja

The children of Okahandja depicted their town through a range of 'lenses', 'angles' and 'scales'. Some drew Okahandja from an aerial point of view and incorporated residential and commercial locales (See APPENDIX D). Whereas others drew their home environment or local community from a base or 'street' view (Figure 5.1c). Some children represented their environment solely as natural areas (Figure 5.1a), but most integrated social and built features in their drawings (Figures 5.1c and 5.1e). The majority of the children (73.6%) drew houses and 53.6% drew tarred roads. Some children focused on roads that pass and transect Okahandja (Figure 5.1d). Other man-made features that were prevalent were cars, pubs and shebeens [10] and shops. Although nearly two thirds (63.6%) of the children depicted Okahandja as a dirty town, emphasis was placed on the town's natural features and surrounding areas: 55.5% drew trees and bushes and 59.1% drew grass. Animals did not feature commonly in the drawings with only 20% including domestic and wild animals in their drawings. Abiotic elements such as hills, clouds and rivers appeared in 59.1% of the drawings. 'Dirty' environmental features such as litter (45.5%) and contaminated water (24.5%) were recurring themes (Figure 5.1f). Socio-economic issues such as conflict between community members, alcohol and substance abuse and homeless people were illustrated in 58.2% of the drawings (Figure 5.1b). Figure 5.1 is a compilation of some of the children's current-image drawings of Okahandja. All the categories of features included in the current-state drawings are listed and quantified in Table 5.2.

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[10] A bar or club where alcoholic beverages are sold without a license.

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Source: Participatory drawing exercise

Figure 5.1 Examples of current-state drawings of Okahandja

Table 5.2 Categories and subcategories of features children included in their current-state drawings

| Drawing 1: Current picture or image of Okahandja | | |
|---|---|---|
| **Categories and subcategories of elements** | **Frequency** | **Percentage*** |
| **PEOPLE** | 42 | 38.2 |
| **PLANTS** | | |
| Trees and bushes | 61 | 55.5 |
| Flowers | 9 | 8.2 |
| Fruit trees and/or vegetable gardens | 3 | 2.7 |
| Grass | 65 | 59.1 |
| **ANIMALS** | 22 | 20.0 |
| **ABIOTIC ELEMENTS** | 65 | 59.1 |
| **BUILT-UP FEATURES** | | |
| Houses | 81 | 73.6 |
| Schools | 9 | 8.2 |
| Shops or shopping centres | 19 | 17.3 |
| Pubs and shebeens | 19 | 17.3 |
| Clinics | 5 | 4.5 |
| Churches | 3 | 2.7 |
| Cars | 15 | 13.6 |
| Tarred roads | 59 | 53.6 |
| Gravel roads | 17 | 15.5 |
| Street light | 5 | 4.5 |
| Fences | 8 | 7.3 |
| Taps | 2 | 1.8 |
| Traffic signs | 8 | 7.3 |
| Welcome signs | 5 | 4.5 |
| **DIRTY ENVIRONMENTAL ELEMENTS** | | |
| Smoke | 3 | 2.7 |
| Litter or rubbish | 50 | 45.5 |
| Overfull rubbish bin | 17 | 15.5 |
| Contaminated water sources | 27 | 24.5 |
| Flies | 4 | 3.6 |
| Bad odours | 6 | 5.5 |
| Degrading environmental behaviour | 9 | 8.2 |
| **CLEAN ENVIRONMENTAL ELEMENTS** | | |
| Swimming pool | 1 | 0.9 |
| Rubbish bins and recycling | 5 | 4.5 |
| **SOCIO-ECONOMIC ISSUES** | | |
| Alcohol and substance abuse | 11 | 10.0 |
| Vandalism | 8 | 7.3 |
| Crime, conflict or unhappiness | 25 | 22.7 |
| Disorderly conduct | 6 | 5.5 |
| Homeless or street children | 7 | 6.4 |
| Poorly built houses | 4 | 3.6 |
| Collecting water and firewood | 3 | 2.7 |

Note: * Percentage of children who included a named element in their drawing.

5.3.4.2 Pictures of the 'dream Okahandja – a possible future state'

The purpose of the 'future state' drawings was to communicate how the children want Okahandja to change and what they want their 'desired' environment to look like. As expected, many children drew their future to be the opposite of their currently perceived view of Okahandja, hence a reoccurrence of categories. However, there were significant differences between the present and future states regarding the frequency of items drawn in the different categories. New subcategories also appeared. It is noteworthy that all children drew Okahandja as a cleaner and greener town with no environmental problems or dirty environmental elements. Natural features remained prominent with 44.5% drawing trees and bushes and 50% drawing abiotic elements (water, clouds, sun, and hills) (Figure 5.2a). About 12% drew fruit trees and vegetables gardens in the future-state drawings as opposed to only 3% in the current-state drawings (2.7%). Regarding built-up features, 52.7% drew houses compared to 73.6% in the current-state drawings. A feature introduced in the future-state drawings was high-rise buildings (Figures 5.2c and e). Of particular interest is that some children drew a combination of simple ground-level houses and high-rise buildings, whereas others replaced all single-level buildings with multiple-level buildings. It is also significant that gravel roads were absent from the future state, although tarred roads were only drawn by 3% more drawers. Various clean environmental elements such as available infrastructure supporting a cleaner environment (e.g. rubbish bins) (20%) and a park (20.9%) (Figure 5.2d) were depicted in the future-state drawings as improvements to the physical environment. Figure 5.2b is symbolic of the harmony between humans and the natural environment and is one example of future-state drawings of harmony and happiness (23.6%). Harmony and happiness were typically demonstrated by smiling faces. Figure 5.2f is an example of the 8% of drawings with welcome signs, in addition to 'hope', 'education', 'enjoy', 'town hall' and a hospital. All the categories of elements included in the future-state drawings are listed and quantified in Table 5.3.

Source: Participatory drawing exercise

Figure 5.2 Examples of future-state drawings of Okahandja

Table 5.3 Categories and subcategories children included in their future-state drawings

| Drawing 2: Future state sate of Okahandja | | |
|---|---|---|
| **Categories and subcategories of elements** | **Frequency** | **Percentage\*** |
| **PEOPLE** | 33 | 30.0 |
| **PLANTS** | | |
| Trees and bushes | 49 | 44.5 |
| Flowers | 19 | 17.3 |
| Fruit trees and/or vegetable gardens | 13 | 11.8 |
| Grass | 53 | 48.2 |
| **ANIMALS** | 19 | 17.3 |
| **ABIOTIC ELEMENTS** | 55 | 50.0 |
| **BUILT-UP FEATURES** | | |
| Houses | 58 | 52.7 |
| Schools | 15 | 13.6 |
| High-rise buildings | 51 | 46.4 |
| Shops or shopping centres | 19 | 17.3 |
| Pubs and shebeens | 3 | 2.7 |
| Clinics or hospitals | 13 | 11.8 |
| Churches | 8 | 7.3 |
| Cars | 16 | 14.5 |
| Helicopters | 3 | 2.7 |
| Tarred roads | 62 | 56.4 |
| Street light | 10 | 9.1 |
| Fences | 4 | 3.6 |
| Taps | 3 | 2.7 |
| Traffic signs | 7 | 6.4 |
| Traffic lights | 10 | 9.1 |
| Welcome signs | 9 | 8.2 |
| **CLEAN ENVIRONMENTAL ELEMENTS** | | |
| Parks | 23 | 20.9 |
| Swimming pools | 16 | 14.5 |
| Rubbish bins and recycling | 22 | 20.0 |
| Clean water | 18 | 16.4 |
| Environmentally responsible behaviour | 10 | 9.1 |
| **FEATURES OF COMMUNITY COHESION** | | |
| Harmony and happiness | 26 | 23.6 |
| Love | 8 | 7.3 |
| Children playing | 12 | 10.9 |
| Entertainment | 15 | 13.6 |

Note: \* Percentage of children who included a named element in their drawing.

In Section 5.4 the results of the participatory drawing exercise are discussed.

**5.4 DISCUSSION**

Subsection 5.4.1 explains how the children depicted their drawings whereas Subsection 5.4.2 provides a sketch on the socio-economic context of the artists and Subsection 4.5.3 describes the children's viewpoints regarding the natural environment while Subsection 4.5.4 investigates the children desire for man-made features.

### 5.4.1   Children's drawings

All the children demonstrated an ability to express their thoughts, views and feelings in drawings that represent 'snapshot pictures'. Studies (Burkitt, Barrett & Davis 2003; Burkitt, Barrett & Davis 2009; Günindi 2012; Oğuz 2010) have noted the meanings attached to colour and in this study some children used dark colours (e.g. black) and neutral colours (e.g. brown) in their present-state drawings to express their dissatisfaction with place, the challenges they face and the 'feeling' toward concrete elements of their environments. Lighter and brighter colours (e.g. yellow and pink) were used to illustrate hope, love, happiness, beauty and peace in the future-state drawings. As reported by Fleer (2002), these older children were able to position themselves in their environment and expose the effects of the environment on themselves. The results not only reveal these children's environmental perceptions but also the factors that possibly impede them from taking environmental action. In this vein, the next subsection looks at the socio-economic context of the children which may influence their relationship with the environment.

### 5.4.2   Socio-economic context

The majority of children (63.6%) portrayed the environment as 'dirty' (full of litter) showing that they are exposed to some form of pollution in their everyday lives. Anderson-Brolin (2002) and Satterwaitte et al. (1996) reason that socio-economic factors influence children's environmental perceptions in various ways so that findings should be contextualised to the specific study subjects. It is crucial to study children's relationships with the natural environment through lenses of location, culture and socio-economic status (Kalvaitis & Monhardt 2012). According to Barraza (1999) groups having low socio-economic status are more likely to depict environmental problems because they are exposed to them. Another causal factor in place characterisation is a participant's place attachment. Rollero & De Piccoli (2010) found that highly attached individuals described their city positively, such as beautiful and welcoming, whereas weakly attached participants described their city negatively, emphasising the presence of pollution for example. The fact that some participants illustrated Okahandja from a negative stance is congruent with the moderate place attachment discussed earlier.

Whereas socio-economic issues, such as crime and conflict between community members (22.7%), alcohol and substance abuse (10%) and vandalism (7.3%) were illustrated in the current-state drawings, community cohesion features such as harmony and happiness (23.6%), entertainment (13.6%) and children playing (10.9%) were portrayed in the future-state drawings. The frequency of signage such as 'Okahandja Garden Town' and 'Welcome to Okahandja' increased by 3.7% between the current-state drawings and the future-state drawings. This

signifies that these children want to feel proud of their town, want to invite people to visit the town and want to accentuate the uniqueness of Okahandja's environment and cultural context. This is congruent with Kalvaitis & Monhardt's (2012) findings that some children portray their relationships with their environment from a complex, moral-development stance by focusing on thoughts and feelings. All these aspects are particularly important as they provide a glimpse into the relationships of community members and the possible inhibitors or drivers of PEB. The socio-economic issues illustrated in the current-state drawings contribute to our understanding of these individuals' quality of life and their feelings and affections for Okahandja. As discussed in Chapter 4, place attachment and community cohesion can have a major impact on the capacity and/or willingness of an individual to take action against environmental degradation. Subsection 5.4.3 explores the children's view regarding the change in the natural environment between the current-state and future-state.

### 5.4.3   Natural environment

Despite the study area being surrounded by savannah vegetation, only 55.5% of the children drew trees and bushes in their first drawing. Wandersee & Schussler (1999) refer to 'plant blindness' as children often being unable to notice plants and not valuing plants due to anthropogenic rankings. Anthropogenic rankings refer to plants being inferior to animals thus unworthy of consideration. This is an important and interesting finding as 32% indicated that their families collect firewood (Subsection 4.2.2). Those who did incorporate trees and bushes into their drawings showed awareness regarding colour, seasonality and the aesthetic qualities of plants. As in Lindemann-Matthies (2006) and Alerby (2000), the Okahandja children placed great value on visual attractiveness and aesthetics. In the second drawing this is signified by increased frequency of flowers and the prevalence of terms such as 'clean' and 'beautiful'. The children also substituted dry yellow grass in current-state drawings with green grass in their future-state drawings. A slight increase in the incidence of fruit trees and vegetable gardens is notable as some children hope to be sustained by community gardens in the future. This can of course be ascribed to their personal experiences with agricultural activities in rural contexts. Visual aspects, such as the dispersal of litter emerged, while other environmental issues, such as smoke (2.7%) caused by the burning of household waste and the chopping down of trees were neglected. This is congruent with the focus group discussions as only one participant pinpointed the burning of waste as problematic (Subsection 4.4.2). Features of the natural environmental, such as abiotic elements, animals and grass were slightly less prevalent in the second drawings but were still regarded as essential and integral parts of their future environments. A marked contrast between the future-state drawings and the current-state drawings was the attention given

to clean environmental characteristics in the former. Blanchet-Cohen, Ragan & Amsden (2003) advance that if a child incorporates recycling (reduce, reuse, recycle) symbols, it points to an overall change of attitude. While environmental problems were wholly absent in the second drawings, children typically included human activities such as playing outside and swimming in natural environments like a park. It transpired that the socio-cultural context of the town was drawn in harmony with the natural environment. Also, the human-made features in the drawings were reordered as not disturbing or obstructing the natural environment in the future state. Altman & Chemers (1980) found that traditional Eastern groups (Asian and African) believe that humans exist in a harmonious relationship between humans and nature. In the next subsection the children's desires for human-made features in the future Okahandja are investigated.

### 5.4.4   Man-made features

Barraza (1999) found that Mexican children gave significant importance to rural areas, possibly because rural areas are associated with fun, adventure and the lack of noise and pollution. In this study, however, children associated rural areas with the lack of entertainment and fun. A possible explanation is that these children have low mobility, low access to information and very few have been to cities where other forms of entertainment are prevalent. The drawing of subcategories such as high-rise buildings and traffic lights revealed that the children have a desire for developments and improvements to their built environment. The children studied by Fleer (2002) illustrated the transformation of countries into cities and technologically orientated environments. Similarly, Barraza's (1999) study revealed that middle-class urban children depicted the future planet Earth as transformed from small towns into big cities. Hobsbawm (1994: 570) argues that "the poor, multiplying and under-employed, want more 'development,' not less." These children associate high-rise buildings and technological improvements with the urban lifestyle and as an opportunity to improve their standard of living. In the Okahandja study the frequency of including houses in drawings decreased significantly (73.6% to 52.7%) between the first and second drawings. Simply-built and one-story houses were replaced or complemented by high-rise apartment buildings and better-built houses. Whereas these developmental changes reflect the desire of some of the Okahandja subjects, others desire simple improvements such as better and sturdier houses. Some children hope for improved housing that would enable them to better accommodate their family. No child illustrated gravel roads in their second drawing, rather drawing well-constructed tarred roads that would increase accessibility to different areas of town. Because some children drew roads intersecting in or passing through Okahandja as central features in their first drawings, they do not necessarily consider the town as a significant place in the Namibian landscape. It is interesting that the frequency of people drawn

decreased from the current state drawings (42.7%) to the future-state drawings (30%). This reduced frequency of people drawn in the streets exemplifies the children's hope that improvements to infrastructure and technology will provide job opportunities and greater economic activity in Okahandja. Another prominent finding was the drawing of improved schools and health care facilities, expressions of their desire for better education, health and living standards. This also makes plain the socio-economic challenges faced by these communities. The children seem willing to exchange natural environmental features for built features and developments if these will improve their daily lives. Wilfred Beckerman, a conservative economist explained that: "Poor people will naturally have a greater incentive to give priority to more goods and services than to the environment in general" (Beckerman 1974: 89). This confirms Van Petegem & Blieck's (2006) findings that people from non-industrialised countries have a holistic view of the human–environment relationship. It appears that the Okahandja children have an environmental-sustainability outlook. They do regard the natural environment as important but their circumstances and living conditions cause them to focus their reasoning and worldviews beyond the natural. Ultimately, they are equally concerned about the natural environment and the social and economic well-being of themselves and their communities.

## 5.5 CONCLUSION

Prominent changes observed in examining the current-state drawings and future-state drawings were increases in cleanliness, lushness of plants, aesthetically pleasing features, development and technology. These changes are associated with improved environmental health and aesthetics, higher standards of living, better living conditions, better health and education. The children did express concern about the environment but their drawings made it clear that they are willing to compromise on elements of the natural environment for their own socio-economic well-being. As reported in Chapter 4, emphasis was again placed on the role of community, social capital and the general social well-being of everyone in Okahandja. The importance of place attachment, place satisfaction and place functionality was again highlighted as important in the way the children think about Okahandja. The children seem to exhibit a sustainable outlook by displaying a balance between both ecocentric and anthropocentric worldviews. For some, the regaining of the status of Okahandja as Garden Town of Namibia is important. No child pointed up environmental problems such as the large scale burning of household waste and the chopping down of trees. This probably discloses that children tend to focus more on environmental problems that threaten the aesthetics of the town than on the large-scale and long-term effects of other environmental problems. This should draw the attention of EE researchers and

educationalists to ensure that young people are informed about the fruitful effects action against environmental problems have on the health of the environment and people. EE should develop children's understanding of complex environmental issues and improve their skill sets for effectively resolving environmental issues.

In this study the contents of drawings were coded into categories to provide semi-quantifiable data to assist visual analysis but the complexity of the drawings should never be underestimated and the drawing of conclusions must be done judiciously. However, with the use of drawings in conjunction with other methods (questionnaire survey, transect walk observations and focus group discussions), one can arrive at a more holistic understanding of children's understanding and reasoning. This case study has attempted to demonstrate that drawings can reveal what children experience and notice in their local environments and their future ideals for themselves, their communities and the natural environment.

Chapter 6 concludes the report.

# CHAPTER 6 SUMMARY OF FINDINGS AND RECOMMENDATIONS

In this chapter the main findings are summarised, the objectives are reassessed, the limitations of the study are outlined and recommendations are made about the mitigation of environmental problems in Okahandja through environmental education (EE) and the active involvement of community members.

## 6.1 REVISITING THE OBJECTIVES: A SUMMARY AND SYNTHESIS OF THE MAIN FINDINGS

The aim of the study was to investigate the environmental reasoning of secondary-level schoolchildren of Okahandja so as to establish the main determinants of their environmental knowledge, attitudes and behaviour. This aim was to be realised through the achievement of six research objectives. Each objective is restated in this section and the salient findings of the previous chapters are presented to evaluate the attainment of each objective.

> **Objective 1:** Review the appropriate literature to better understand concepts, theories, models and case studies relating to pro-environmental behaviour, pro-environmental awareness and environmental education.

To achieve this objective, theories, models, hypotheses and frameworks in the scholarly literature were examined. The literature extended beyond geography into journals, books, reports, theses and conference proceedings in the subject fields of environmental psychology, environmental education, environment and behaviour and so forth. Recourse was made to appropriate literature to assist with the development of the research instruments and to find support or contradiction of the research findings. The literature produced evidence that a connection does exist between environmental behaviour, attitudes and values but that the relationship is mediated and influenced by numerous factors (e.g. environmental knowledge, concern, awareness, values, role models, socio-economic status and locus of control). The literature revealed that different factors can influence the reasoning of different individuals to varying degrees, making environmental behaviour ever-changing and somewhat unpredictable. The very complex nature of environmental behaviour is evident in the literature from scholars' constant seeking of new approaches to investigate individuals' environmental reasoning. Despite the long and continuing attention to environmental behaviour and factors that influence environmental behaviour, no consensus has been reached on the factors that reliably predict pro-environmental behaviour (PEB).

> **Objective 2:** Become familiar with and gain insights into the local environmental contexts (ecological and social) through observational (transect) walks in the study area.

This objective was to conduct transect walks through the residential areas of Okahandja to give the researcher (as outsider) a contextual understanding on the schoolchildren's (as insiders) way of living, their livelihoods and challenges they face. The information gathered during the transect walks supplemented the scant information about Okahandja. Observations were made according to a checklist of features, namely identify community types, determine conditions of roads, local buildings and houses, water sources, sanitation conditions, sources of pollution, fuel types and the condition (and availability) of vegetable gardens and livestock. Observations were recorded in a notebook and complemented by photographs. The main findings of the observations are that all the residential areas are close or adjacent to natural environment; inhabitants of Nau-Aib, Oshetu and Vyf Rand Camp frequently spend time in the natural environment collecting firewood and harvesting food products; some of them are highly dependent on natural resources for their livelihoods; environmental problems are prevalent, namely land pollution (littering and unattended refuse heaps) and air pollution (burning of household waste). Unaccompanied small children and unwatched grazing animals interact with these contaminated spaces. Conversations with community members confirmed that unemployment is a serious issue in the communities. Shebeens and pubs abound.

> **Objective 3:** Question secondary-level schoolchildren at JG van der Wath Secondary School about the factors (e.g. knowledge and environmental concern) that influence their environmental reasoning.

A questionnaire survey (48 questions) was administered to acquire biographical and socio-economic information about a sample of schoolchildren and to determine their environmental behaviour, knowledge and concern about the environment in general and their local environment in particular. The 345 completed questionnaires provided empirical data analysed by a variety of quantitative techniques to produce results that helped to understand the secondary-level schoolchildren's environmental knowledge, concern and behaviour.

Regarding the *environmental knowledge* of the participants it was found that 95% took one or more environment-related subject (geography, life science, agriculture, and biology); they were well-informed about the mutual reliance of organisms and; they were less informed about the availability of clean drinking water in some parts of Namibia. Their environmental knowledge

improved with increased grade level, so indicating that education (with EE components) does enrich an individual's environmental knowledge. Moreover, participants were found to be well aware of the importance of Okahandja being a clean town by virtue of their own ability to identify the consequences of a dirty environment on the environment, the people, the economy and the aesthetics of Okahandja.

Participants achieved high scores on the general *environmental concern* scale with a median of 4.5 on a Likert scale of 1.0 (strongly disagree) to 5.0 (strongly agree). As found in other studies, female participants reached higher levels of general environmental concern which is often ascribed to a female roles as caretaker and nurturer. Ovambo participants displayed the highest levels of environmental concern and Coloured participants the lowest. Participants' place of residence was not significantly related to environmental concern, probably because most residential areas (except Smarties) evidence environmental issues that cause elevated levels of environmental concern among the participants. Elevated general environmental concern did correlate with environmental behaviour such as the saving of energy, the closing of a running tap and the acceptability to throw a plastic bag in the street. Higher environmental concern is expected to correlate with PEB but other research has shown that environmental concern is a poor predictor of PEB. Four out of five participants agreed (agree or strongly agree) that humans are part of the natural environment and 93% agreed that we need the natural environment to survive, but 62% countered that humans have the right to change the natural environment to suit their needs and three out of five asserted that we are meant to rule over the natural environment. The participants supported the use of the natural environment to sustain human life but in a 'balanced' system where use is done harmoniously and non-destructively. The participants' utilitarian support for the natural environment is related to their livelihoods, way of living and socio-economic standards.

Participants' *environmental behaviour* was determined by questions on self-reported behaviour and verbal commitment. The participants generally displayed high levels of willingness for environmental protection and self-reported PEB: three out of four reported that they would keep an empty chips packet rather than throw it on the ground; four out of five would rather close a running tap; two out of three would voluntarily participate in environmental clean-ups; and one out of two were willing to take their own cloth bag for shopping rather than using a free plastic bag. There was consensus (91%) that littering is unacceptable behaviour. The few who saw littering as acceptable reasoned that not to litter takes too much effort and that no strict rules exist to regulate littering. A general finding was that participants were unwilling to invest time, money and effort into environmental protection. A surprising finding was that one out of two

believed that littering contributes to job creation. This perception can result in people encouraging littering with the hope that it will mitigate unemployment in Okahandja which may lead to greater environmental degradation.

> **Objective 4:** Investigate the influences (im)mobility (low access to transport) and place attachment to Okahandja have on the schoolchildren's views and perceptions of the environment.

This objective aimed to investigate the relationship between place attachment, mobility, environmental reasoning and environmental behaviour. The international literature has confirmed that *place attachment* is a complex construct of people and places. Whereas the earlier literature did not necessarily include place attachment and place meaning into environmental behaviour frameworks, recent works recognise the relationship between the value people tie to a place and their consequent environmental behaviour. This study questioned participants about their mobility and recorded discussants' comments on the relationship during the focus group sessions. It was found participants' place attachment to Okahandja was moderate with a median of 3.5 generated on a scale of 1.0 to 5.0. Ethnicity was found to influence the environmental behaviour of the Okahandja participants to the extent that the Ovambos measured a stronger place attachment (mean of 3.65) than the other groups with Coloured participants the lowest (mean of 3.06). Regarding residential area the participants residing in Vyf Rand Camp unexpectedly recorded the highest mean score (3.76) on the place attachment scale so confirming that place attachment is not always tied to the physical properties and aesthetics of a place but also to emotional dimensions.

The quantitative and qualitative findings clearly affirm that community bonds and social cohesion play an important role in the way participants feel and experience Okahandja with frequent references being made to family, friends, neighbours and 'us'. However, mistrust and disloyalty between residents and municipal officials were found to exist causing inhabitants to behave inappropriately in protest against and disagreement with municipal officials regarding poor services and infrastructure provided by the municipality. Conflict between residents and municipal officials was found to be a major contributor to environmental pollution and degradation. Also, in and around Okahandja certain harmful environmental behaviour has been accepted as the norm so resulting in others adopting similar habits and behaviour regardless of the damage caused. This is an indication that social processes and social contexts are key ingredients of an understanding of environmental attitudes and behavioural change. It was found

that place attachment and the meaning tied to Okahandja are weakened by the lack of economic and recreational opportunities which lead to unemployment and socio-economic problems. One can concluded that place attachment and place meaning in Okahandja play profound roles in the children's environmental attitudes with weakened place attachment or dissatisfaction with place (and its inhabitants) having detrimental effects on the environment as people's sense of ownership and pride diminished.

The participants experienced low to moderate levels of *mobility* with 24% having travelled outside Namibia, only 22% have ever travelled to the Oshana Region (approximately 643 km from Okahandja) and just 5% had never travelled outside the region in which Okahandja is located. Concerning tourist destinations, 69% have visited Gross Barmen Hot Springs (27 km from Okahandja) and 60% Von Bach Dam Resort (9 km from Okahandja). These low visitation level to tourist destinations close to Okahandja can translate to participants being unaware of Okahandja and the wider region's tourism significance and potential. Also, higher frequencies of visitation to nature parks have been found elsewhere to indicate higher place attachment so increasing an individual's willingness to behave pro-environmentally. While no significant difference was found between the environmental concern of the participants who had travelled outside Namibia and the others one can safely assume that higher levels of mobility can be associated with higher levels of environmental awareness and PEB because travel broadens an individual's and provides access to various 'comparative mental landscapes'. Although the relationship between mobility and environmental behaviour is largely undocumented, one can argue that increased awareness of places (through repeated contact) enables an individual to better distinguish between appropriate and inappropriate environmental behaviour. This was confirmed by participants making references to the environmental conditions of other places and the attitudes of individuals living there.

> **Objective 5:** Explore how the children view their local environment and how they want their living environment to change by means of a drawing project involving the 'current state' and the 'dream Okahandja – a possible future state'.

Participatory drawing was used to achieve this fifth objective. The participatory drawing exercise was done to gain insights into the children's perceptions on the environmental state of Okahandja. Grade 9 and 10 learners drew their perceived current state of Okahandja to help our understanding our understanding of the environmental problems, concerned spaces and hardships experienced in their local environment and their 'future-state' drawings illustrated their

expectations and hopes for the town. A 'draw-and-tell' technique was used by which the children describe their pictures. The drawings were analysed according to their general 'feel' and the messages conveyed in the drawings by taking cognisance of the use of colour, the size and height of elements in relation to others, the reoccurrence and frequency of depicting elements and the use of symbology.

The results analyses of the art confirm, strengthen and support the findings of the survey and focus group discussions. In the current-state drawings the town was portrayed as a dirty town, polluted by litter, refuse and dirty water. Various nature elements like plants, hills and animals featured the drawings. Socio-economic problems such as unemployment, crime and alcohol abuse were also illustrated. The finding that no one illustrated the burning of household refuse, illegal sand mining and the chopping down of trees suggests that they do not necessarily consider these as problems or being significant. The drawings of the 'wished-for' state presented a combination of natural and human-made features in a future with a highly developed economy, urban growth and advanced technology associated with increased job opportunities, better standards of living and more entertainment. The results support the findings on environmental worldview as they showcase participants' 'sustainability' outlook rather than a purely anthropocentric or ecocentric worldview. Their desire for development does not overshadow their awareness of protecting the environment.

> **Objective 6:** Use focus groups to examine whether children from different ethnic population groups reason differently about the environment and whether these distinctions influence their interactions with their surroundings.

Three focus groups, each representing a homogenous ethnic group (Ovambo, Herero or Damara) were used. Seven questions (recall 3.3.4) were discussed. No significant differences were noted between the three ethnic groups' environmental reasoning although the Ovambos clearly reflected a stronger attachment to Ovamboland. The other two ethnic groups made reference to places such as Ovitoto, Otjiwarongo, Okakarara and Swakopmund as places they would like to reside in and to which they feel connected because family live there. All three groups think about their daily environmental behaviour if there are monetary costs involved. Different environmental behaviour is displayed toward private property compared to public property because the former is tied to their self-image and self-worth. Female discussants displayed higher levels of concern for the environment than males. Many participants highlighted their fathers' careless attitudes to the environment whereas their mothers and grandmothers often

modelled both acceptable and unacceptable environmental behaviour. Male participants tended to follow their fathers' example as household heads rather than their mothers'. One can conclude that weak PEB values and attitudes of fathers as breadwinners can influence the environmental attitudes and behaviour of their children.

Although all six of the objectives were met, this study was not free of limitations as discussed in the following section.

## 6.2 LIMITATIONS OF THE STUDY

Certain limitations, particularly regarding the methods used, should be pointed out. The questionnaire was constructed to interrogate both general and context-specific environmental reasoning. Some questions were borrowed from existing questionnaires as appropriate and others were purpose-made for the study. Such a mixture could, of course, constrain comparisons with other studies, especially those done in developed countries. Borrowed questions were modified to be understood by schoolchildren in Okahandja study area. The advantages of constructing a context-relevant and applicable questionnaire hopefully exceed the disadvantages. There were complaints that the questionnaire was too long and few struggled to understand the meaning of 'neutral' in the Likert scale.

The conducting of the survey, drawing exercise and focus groups in a school setting caused some participants to think their responses and drawings were being tested, assessed and scored. Although participants were encouraged to provide honest opinions and that no 'wrong or right' answers existed, the possibility of responses given just because they are socially more desirable and acceptable exists. Also, participants' self-reported environmental behaviour is possibly flawed as it is seldom a true reflection of actual environmental behaviour. Recording the actual behaviour of the secondary-level schoolchildren is a demanding task beyond the scope of this study.

The validity of convenience sampling in selecting questionnaire participants is questionable because participants were selected on availability, so creating a greater window for biased results and findings. It is hoped that this study did reach the target population, and that representiveness was adequate although Grade 12 learners were omitted.

All the members of the focus groups participated, although in one group the males tended to dominate the discussions and in another group the females were more outspoken so raising the possibility of gender bias. Most participants indicated agreement with statements by nodding and

those who seemed to disagree by shaking their heads to indicate disapproval or denial were asked to verbally express their opinions.

During the participatory drawing exercises unskilful and non-artistic participants might have felt overwhelmed by the activity and ashamed of their drawings, causing them to omit certain elements from their drawings because they felt incompetent. Although Mitchell et al. (2011: 23) have recommended that "participants need a choice of culturally and contextually congruent drawing paraphernalia", the participants were issued coloured oil pastels which they were not necessarily used to. Some participants also preferred to sketch first in pencil before colouring in with the oil pastels. The drawing tools could have invoked anxiety in some of the children but they were chosen to obtain drawings rich in expression.

Finally, the use of mixed methods to investigate such a complex and multifaceted topic was challenging. The capturing, analyses and interpretations of the four methods were tedious, time consuming and required a range of skills. The next section makes recommendations.

## 6.3 IMPLICATIONS AND RECOMMENDATIONS

The study was undertaken because the researcher's curiosity and concern were excited by a specific context of environmental problems. The context is important due to its location in Namibia. Apart from the consequences a degrading natural environment has on the sustainability of Namibia's natural environment and the inhabitants of Okahandja, the researcher believed that this medium-sized town can seriously threaten the attractiveness of the Namibian landscape for tourism. The environmental reasoning and behaviour of secondary-level schoolchildren was deemed to be particularly important because they constitute a large portion of the total population of Okahandja and they are the town's (and country's) future decision makers. By understanding the factors that influence their environmental reasoning, the government, EE educators and researchers can make recommendations with the aim to eliminate environmental problems.

The researcher, as geography advanced scholar and teacher, maintains that despite children having already received formal education for 8 to 11 years, the schooling system (often as the main contributor to learning about PEB) has failed to establish and inculcate a well-defined set of pro-environmental attitudes and values in the participants. This results in children being negatively influenced by inept role models, peer networks and community members. Rather than taking independent stances against environmental degradation the children conform to the behaviours of others and 'follow blindly'. It is recommended that changes be made on three

levels (parents, school and community) to bring about change in Okahandja (and Namibia in general).

First and most basically, attention must be given to the environmental attitudes, values and behaviour of *parents*. Because some parents are illiterate they have quite likely never had access to any form of EE themselves and do not really understand the harmful consequences inappropriate environmental behaviour can have locally, even nationally, now and in the long run. Parents should be informed and educated about PEB and taught techniques to implement PEB, such as reusing materials and composting waste for your own garden or for sale. In these ways parents will model positive PEB to influence the environmental reasoning of their children.

Second, the significance of *schools* in instilling pro-environmental values and attitudes of learners should not be underestimated. Throughout a child's formal education, continuous learning *about*, *through*, *in* and *for* the environment should take place. This is achievable when education extends beyond its merely theoretical basis of informing to the development of skills, critical thinking and problem solving. Environment-related subjects – geography, biology, life science and agriculture – must be taught to expose children to real-world environmental phenomena, processes and problems. Children should act as problem solvers and given the opportunity to brainstorm with peers and to propose solutions. Geography must be endorsed as the school subject providing a platform for making schoolchildren aware of human–environment relationships. By developing children's geographical consciousness (Section 1.9), they will became empowered and more capable of making decisions to foster a sustainable future.

Furthermore, children must be afforded opportunities to experience their local environments and own country in renewed ways. Field trips must be organised, facilitated and financed to visit and study special tourist destinations or environmentally-fragile areas first hand. School classrooms must be equipped with educational material (e.g. nature documentaries and virtual spaces) especially for children who have limited access to the media – television, radio, newspapers and the Internet. These aids can especially assist children from poor socio-economic backgrounds to experience and 'view' the natural environment in different ways. The relationship between 'comparative mental landscapes' and PEB needs to be investigated further in the future.

The function of teachers as PEB role models must not be neglected. Teachers not only bear a responsibility to transmit knowledge to children: they play a vital role in nurturing the way children feel about the environment. When a teacher communicates educational content passionately and creatively, children are enduringly influenced to behave similarly toward the

environment. The role of teachers and the usefulness of EE material can be complemented by guest speakers and professionals who can provide children with refreshing perspective on environmental protection.

Concerning the *community,* environmental issues in Okahandja can be resolved through cooperation with and participation of residents and local authorities. Organised environmental clean-up campaigns can involve all community members to make contributions. These can be organised to be harmonious by arranging social events around the environmental clean-ups. Incentives can be given and prizes offered to individuals and businesses to contribute to and take part in the events. It is also recommended that the structured opportunities in Okahandja can be improved by providing better service delivery such as refuse removal, developing recycling facilities and providing more rubbish bins. Recycling will not only contribute to a cleaner environment but people can earn a living from it, so decreasing unemployment and help alleviate poverty. Such actions should help restore trust between residents and municipal officials. Also, more entertainment, recreational and job opportunities offered in Okahandja can strengthen people's place attachment and the value they tie to Okahandja. The net result can be a reduction in environmental problems and enhanced PEB. The final section concludes the report.

## 6.4 CONCLUSION

This research adds value to the existing scholarship on the environmental perceptions and reasoning of Africans and more particularly Namibians. The findings of this research support the argument that environmental knowledge and attitudes may not be reflected in everyday activities but that environmental knowledge, concern and self-reported behaviour correlate with the intensity of environmental education. Environmental problems are often the product of socio-economic issues as many people live in survivalist mode that causes them to focus on their day-to-day existence while knowingly causing environmental degradation. For this reason, to overcome our environmental problems a shift from materialist to postmaterialist values is required. We cannot expect poor people to spend a lot of time and money on environmental protection and preservation, but everyone, no matter socio-economic status, should be informed about and encouraged to act according to appropriate environmental behaviours that are simple and involve minimal cost. By empowering individuals, they can become active agents of change, each in their own abilities and capacities. With adequate involvement from institutions, the government and citizens, the unique Namibian landscape can be protected which will ensure the sustainability of the tourism sector and well-being of people in the country.

[43 386 words]

# REFERENCES

Abowitz DA & Toole TM 2009. Mixed method research: Fundamental issues of design, validity, and reliability in construction research. *Journal of Construction Engineering and Management* 139: 108-116.

Africa's Finest 2015. The Top 50 [online]. Available from: http://africasfinest.co.za/the-top-50/ [Accessed 1 July 2015].

Ajzen I 1985. From intentions to actions: A theory of planned behavior. In Kuhl J & Beckmann J (eds) *Action control: From cognition to behavior,* 11-39. Berlin, Heidelberg, New York: Springer.

Ajzen I 1991. The theory of planned behavior. *Organizational Behavior and Human Decision Processes* 50: 179-211.

Ajzen I & Fishbein M 1977. Attitude-behavior relations: A theoretical analysis and review of empirical research. *Psychological Bulletin* 84: 888-891.

Ajzen I & Fishbein M 1980. *Understanding attitudes and predicting social behavior*. Englewood-Cliffs, NJ: Prentice-Hall.

Ajzen I & Madden T J 1986. Prediction of goal-directed behavior: Attitudes, intentions, and perceived behavioral control. *Journal of Experimental Social Psychology* 22:453-474.

Ajzen I, Joyce N, Sheikh S & Cote NG 2011. Knowledge and the prediction of behavior: The role of information accuracy in the theory of planned behavior. *Basic and Applied Social Psychology* 33: 101-117.

Alerby E 2000. A way of visualising children's and young people's thoughts about the environment: A study of drawings. *Environmental Education Research* 6: 205-222.

Alland A 1983. *Playing with form: Children draw in six cultures.* New York: Columbia University Press.

Allen JB & Ferrand JL 1999. Environmental locus of control, sympathy, and proenvironmental behavior a test of geller's actively caring hypothesis. *Environment and Behavior* 31: 338-353.

Altemeyer B 1996. *The authoritarian specter*. London: Harvard University Press.

Altman I & Chemers M 1980. *Culture and environment.* Monterey, CA: Brooks & Cole Publishing Co.

Altman I & Low SM (eds) 1992. *Place attachment.* New York: Plennum Press.

Ambrosius JD & Gilderbloom JI 2015. Who's greener? Comparing urban and suburban residents' environmental behaviour and concern. *Local Environment: The International Journal of Justice and Sustainability* 20: 836-849.

Anderson BA, Romani JH, Phillips H, Wentzel M & Tlabela K 2007. Exploring environmental perceptions, behaviors and awareness: water and water pollution in South Africa. *Population and Environment* 28: 133-161.

Anderson-Brolin M 2002. *Children's right to a good physical environment: Central concepts and problem definition.* Stockholm: Save the Children Sweden.

Anesta E, Caceda A & Michalka S 2004. Development of woodcarving small and medium-sized enterprises in Okahandja, Namibia. An Interactive Qualifying Project Report. Worcester: Worcester Polytechnic Institute, Bachelor of Science.

Antrop M 2004. Rural-urban conflicts and opportunities. In Jongman RHG (ed) The new dimensions of the European landscape, 83-91. Dordrecht: Springer.

Arbuthnot J 1977. The roles of attitudinal and personality variables in the prediction of environmental behavior and knowledge. *Environment and Behavior* 9: 217-232.

Arbuthnot J & Lingg S 1975. A comparison of French and American environmental behaviors, knowledge, and attitudes. *International Journal of Psychology* 10: 275-281.

Arbuthnott KD 2009. Education for sustainable development beyond attitude change. *International Journal of Sustainability in Higher Education* 10: 152-163.

Arcury TA & Christianson EH 1990. Environmental worldview in response to environmental problems Kentucky 1984 and 1988 compared. *Environment and Behavior* 22: 387-407.

Ardoin NM 2006. Toward an interdisciplinary understanding of place: Lessons for environmental education. *Canadian Journal of Environmental Education* 11: 112-126.

Ärlemalm-Hagsér E & Sandberg A 2011. Sustainable development in early childhood education: In-service students' comprehension of the concept. *Environmental Education Research* 17: 187-200.

Aronsson K & Andersson S 1996. Social scaling in children's drawings of classroom life: A cultural comparative analysis of social scaling in Africa and Sweden. *British Journal of Developmental Psychology* 14: 301-314.

Aronsson K & Junge B 2000. Intellectual realism and Social scaling in Ethiopian children's drawings. In Lindström L (ed) *The cultural context: Comparative studies of art education and children's drawings*, 135-159. Stockholm: Stockholm Institute of Education Press.

Attfield 2003. *Environmental ethics: An overview for the twenty-first century*. Cambridge, MA: Polity Press.

Backett-Milburn K & McKie L 1999. A critical appraisal of the draw and write technique. *Health Education Research* 14: 387-398.

Baerwald TJ 2010. Prospects for geography as an interdisciplinary discipline. *Annals of the Association of American Geographers* 100: 493-501.

Baldassare M & Katz C 1992. The personal threat of environmental problems as predictor of environmental practices. *Environment and Behavior* 24: 602-616.

Bamberg S 2003. How does environmental concern influence specific environmentally related behaviors? A new answer to and old question. *Journal of Environmental Psychology* 23: 21-32.

Bamberg S & Möser G 2007. Twenty years after Hines, Hungerford, and Tomera: A new meta-analysis of psycho-social determinants of pro-environmental behaviour. *Journal of Environmental Psychology* 27: 14-25.

Banks M 2001. *Visual methods in social research*. London: SAGE.

Barnard WS 1999. Die weg na 'n omgewingsgeografie. *Acta Academica* 31: 131-161.

Barnard WS 2001. *Conceptions of geography*. Publication No 39/2001. Stellenbosch University: Centre of Geographical Analysis

Barr S 2004. Are we all environmentalists now? Rhetoric and reality in environmental action. *Geoforum* 35: 231–249.

Barr S & Gilg A 2006. Sustainable lifestyles: Framing environmental action in and around the home. *Geoforum* 37: 906-920.

Barraza L 1999. Children's drawings about the environment. *Environmental Education Research* 5: 49-66.

Bartiaux F 2008. Does environmental information overcome practice compartmentalisation and change consumers' behaviours? *Journal of Cleaner Production* 16: 1170-1180.

Batson CD 1994. Why act for the public good? Four answers. *Personality and Social Psychology Bulletin* 20: 603-610.

Batson CD, Turk CL, Shaw LL & Klein TR 1995. Information function of empathic emotion: Learning that we value the other's welfare. *Journal of Personality and Social Psychology* 68: 300-313.

Baumol WJ & Oates WE 1979. *Economics, environmental policy, and quality of life*. Inglewood Cliffs, NJ: Prentice-Hall.

Becher T 1987. The disciplinary shaping of the profession. In Clark BR (ed) *The academic profession*, 271-303. Berkeley: University of California Press.

Bechtel RB, Verdugo VC & de Queiroz Pinheiro J 1999. Environmental belief systems: United States, Brazil, and Mexico. *Journal of Cross-cultural Psychology* 30: 122-128.

Beckerman W 1974. *Two cheers for the affluent society*. New York: St. Martin's Press.

Bell SJ & Bell RC 2008. An illustration of self-characterization in a child's drawing: The importance of process. *Personal Construct Theory & Practice* 5: 1-9.

Berenguer J, Corraliza JA & Martín R 2005. Rural-urban differences in environmental concern, attitudes, and actions. *European Journal of Psychological Assessment* 21: 128-138.

Berger IE 1997. The demographics of recycling and the structure of environmental behavior. *Environment and Behaviour* 29: 515-531.

Berger R 1995. Children draw their stepfamilies. *Journal of Family Psychotherapy* 5: 33-48.

Berk LE 1994. *Children development.* 3rd ed. Boston: Allyn & Bacon.

Berk LE 2012. *Children development.* 9th ed. Boston: Allyn & Bacon.

Berkowitz AR, Ford ME & Brewer CA 2005. A framework for integrating ecological literacy, civics literacy, and environmental citizenship in environmental education. In Johnson EA & Mappin MJ (eds) *Environmental education and advocacy: Changing perspectives of ecology and education*, 227-266. Cambridge: Cambridge University Press.

Berryman T 1999. Relieving modern day atlas of an illusory burden: Abandoning the hypermodern fantasy of an education to manage the globe. *Canadian Journal of Environmental Education* 4: 50-68.

Berthoû SKG 2013. The everyday challenges of pro-environmental practices. *The Journal of Transdisciplinary Environmental Studies* 12: 53-68.

Beukes J 2014. 5 Randkamp verdien beter [online]. Available from: http://www.republikein.com.na/politiek/5-randkamp-verdien-beter.231307#slide-0-field_image-231307 [Accessed 15 January 2015].

Beutel AM & Marini MM 1995. Gender and values. *American Sociological Review* 60: 436-448.

Bittenbender S 2009. Program Statement Memo: Environmental Education at NaDEET Center [online]. Available from: http://www.nadeet.org/sites/default/files/Bittenbender%20Program%20Statement%20Memo.pdf [Accessed 16 April 2015].

Blaine JL 1977. *Tectonic evolution of the Waldau Ridge structure and the Okahandja Lineament in part of the Central Damara Orogen, West of Okahandja, South West Africa.* Bulletin of the Precambrian Research Unit University of Cape Town, 21.

Blake J 1999. Overcoming the 'value-action gap' in environmental policy: Tensions between national policy and local experience. *Local Environment* 4: 257-278.

Blanchet-Cohen N, Ragan D & Amsden J 2003. Children becoming social actors: Using visual maps to understand children's views of environmental change. *Children Youth and Environments* 13: 278-299.

Blanke J & Chiesa T 2013. The travel & tourism competitiveness report 2013: Reducing barriers to economic growth and job creation [online]. Available from:

http://www3.weforum.org/docs/WEF_TT_Competitiveness_Report_2013.pdf [Accessed 12 March 2014].

Blaxter L 2010. *How to research*. 4th ed. Berkshire: Open University Press.

Boeve-de Pauw J, Donche V & Van Petegem P 2011. Adolescents' environmental worldview and personality: An explorative study. *Journal of Environmental Psychology* 31: 109-117.

Bogner FX & Wiseman M 1997. Environmental perception of rural and urban pupils. *Journal of Environmental Psychology* 17: 111-122.

Bogner FX & Wiseman M 2002. Environmental perception of French and some Western European secondary school students. *European Journal of Psychology of Education* 17: 3-18.

Bornman M 1997. Environmental Education and the curriculum: A South African Perspective. *Educare* 26: 56-57.

Botvin G 1991. Substance abuse prevention: Theory, practice, and effectiveness. In Tonry M (ed) *Crime and justice: A review of research*, 461-519, Volume 38. Chicago: University of Chicago Press.

Bowker R 2007. Children's perceptions and learning about tropical rainforests: An analysis of their drawings. *Environmental Education Research* 13: 75-96.

Boyce WT & Keating DP 2004. Should we intervene to improve childhood circumstances? In Kuh D, Ben Shlomo Y (eds) *A life course approach to chronic disease epidemiology,* 415-445. 2nd ed. Oxford: Oxford University Press.

Bradley JC, Waliczek TM & Zajicek JM 1999. Relationship between environmental knowledge and environmental attitude of high school students. *The Journal of Environmental Education* 30: 17-21.

Bradshaw CJ & Brook BW 2014. Human population reduction is not a quick fix for environmental problems. *Proceedings of the National Academy of Sciences* 111: 16610-16615.

Brandenburg AM & Carroll MS 1995. Your place or mine?: The effect of place creation on environmental values and landscape meanings. *Society & Natural Resources: An International Journal* 8: 381-398.

Brechin SR 1999. Objective problems, subjective values, and global environmentalism: Evaluating the postmaterialist argument and challenging a new explanation. *Social Science Quarterly* 80: 793-809.

Brechin SR & Kempton W 1994. Global environmentalism: A challenge to the postmaterialism thesis? *Social Science Quarterly* 75: 245-69.

Brechin SR & Kempton W 1997. Beyond postmaterialist values: National versus individual explanations of global environmentalism. *Social Science Quarterly* 78: 16-23.

Brehm JM, Eisenhauer BW & Krannich RS 2006. Community attachments as predictors of local environmental concern: The case for multiple dimensions of attachment. *American Behavioral Scientist* 50: 142-165.

Breunig M, Murtell J, Russell C & Howard R 2014. The impact of integrated environmental studies programs: are students motivated to act pro-environmentally? *Environmental Education Research* 20: 372-386.

Bricker KS & Kerstetter DL 2000. Level of specialization and place attachment: An exploratory study of white water recreationists. *Leisure Sciences* 22: 233-257.

Brown BB, Perkins DD & Brown G 2004. Incivilities, place attachment and crime: Block and individual effects. *Journal of Environmental Psychology* 24: 359-371.

Brown JM, Henderson J & Armstrong MP 1987. Children's perceptions of nuclear power stations as revealed through their drawings. *Environmental Psychology* 7: 189-199.

Bryman A 2012. *Social research methods*. 4th ed. Oxford: Oxford University Press.

Buck G, Cook K, Quigley C, Eastwood J & Lucas Y 2009. Profiles of urban, low SES, African American girls' attitudes toward science: A sequential explanatory mixed methods study. *Journal of Mixed Methods Research* 3: 386-410.

Burgess J, Harrison CM & Filius P 1998. Environmental communication and the cultural politics of environmental citizenship. *Environment and Planning A* 30: 1445-1460.

Burke C 2005. "Play in focus": Children researching their own spaces and places for play. *Children Youth and Environments* 15: 27-53.

Burkitt E, Barrett M & Davis A 2003. Children's colour choices for completing drawings of affectively characterised topics. *Journal of Child Psychology and Psychiatry* 44: 445-455.

Burkitt E, Barrett M & Davis A 2009. Effects of different emotion terms on the size and colour of children's drawings. *International Journal of Art Therapy* 14: 74-84.

Callicott JB 1994. *Earth's insights: a multicultural survey of ecological ethics from the Mediterranean Basin to the Australian Outback*. Berkeley: University of California Press.

Carleton-Hug A & Hug JW 2010. Challenges and opportunities for evaluating environmental education programs. *Evaluation and Program Planning* 33: 159-164.

Caron JA 1989. Environmental perspectives of blacks: Acceptance of the "New environmental paradigm". *The Journal of Environmental Education* 20: 21-26.

Carson RL 1962. *Silent spring*. New York: Houghton Mifflin Company.

Carter RL & Simmons B 2010. The history and philosophy of environmental education. In Bodzin AM, Shiner Klein B & Weaver (eds) *The inclusion of environmental education in science teacher education*, 3-16. Netherlands: Springer.

Casey PJ & Scott K 2006. Environmental concern and behavior in an Australian sample within an ecocentric-anthropocentric framework. *Australian Journal of Psychology* 58: 57-67.

Castree N, Demeritt D & Liverman D 2009. Introduction: Making sense of environmental geography. In Castree N, Demeritt D, Liverman D & Rhoads B (eds) *A Companion to environmental geography*, 1-15. West Sussex: Blackwell Publishing.

Catton WR & Dunlap RE 1978. Environmental sociology: a new paradigm. *The American Sociologist* 13: 41-49.

Central Bureau of Statistics 2010. *An atlas of Namibia's population: Monitoring and understanding its characteristics*. Windhoek: Central Bureau of Statistics.

Chambers DW 1983. Stereotypic images of the scientist: the draw-a-scientist test. *Science Education* 67: 255-265.

Chapman DP, Whitfield CL, Felitti VJ, Dube SR, Edwards VJ & Anda RF 2004. Adverse childhood experiences and the risk of depressive disorders in adulthood. *Journal of Affective Disorders* 82: 217-225.

Chawla L 1992. Childhood place attachments. In Altman I & Low S (eds) *Place attachment*, 63-86. New York: Plenum Press.

Chawla L 1998. Significant life experiences revisited: A review of research on sources of environmental sensitivity. *Environmental Education Research* 4: 369-382.

Chawla L & Cushing DF 2007. Education for strategic environmental behavior. *Environmental Education Research* 13: 437-452.

Chen FN 2005. Employment transitions and the household division of labor in China. *Social Forces* 84: 831-851.

Chen LP, Murad MH, Paras ML, Colbenson KM, Sattler AL, Goranson EN, Sattler AL & Zirakzadeh A 2010. Sexual abuse and lifetime diagnosis of psychiatric disorders: systematic review and meta-analysis. *Mayo Clinic Proceedings* 85: 618-629.

Chen X, Peterson M, Hull V, Lu C, Lee GD, Hong D & Liu J 2011. Effects of attitudinal and sociodemographic factors on pro-environmental behaviour in urban China. *Environmental Conservation* 38: 45-52.

Cheng JCH & Monroe MC 2012. Connection to nature children's affective attitude toward nature. *Environment and Behavior* 44: 31-49.

Cherney ID, Seiwert CS, Dickey TM, & Flichtbeil JD 2006. Children's drawings: A mirror to their minds. *Educational Psychology* 26: 127-142.

Chipeniuk R 1998. Childhood foraging as regional culture: Some implications for conservation policy. *Environmental Conservation* 25: 198-207.

Clark CF, Kotchen MJ & Moore MR 2003. Internal and external influences on proenvironmental behaviour: Participation in a green electricity program. *Journal of Environmental Psychology* 23: 237-246.

Cleveland M, Kalamas M & Laroche M 2005. Shades of green: Linking environmental locus of control and pro-environmental behaviors. *The Journal of Consumer Marketing* 22: 198-212.

Clifford N, French S & Valentine G 2010. *Key methods in geography*. London: SAGE.

Cohen-Liebman MS 1995. Drawings as judiciary aids in child sexual abuse litigation: A composite list of indicators. *The Arts in Psychotherapy* 22: 475-483.

Collins English Dictionary 2015. Definitions of reasoning. Available from: http://www.collinsdictionary.com/dictionary/english/reasoning [Accessed 27 June 2015].

Collins J, Thomas G, Willis R & Wilsdon J 2003. Carrots, sticks and sermons: Influencing public behaviour for environmental goals [online]. Available from: http://www.demos.co.uk/files/CarrotsSticksSermons.pdf [Accessed 12 June 2015].

Corral-Verdugo V & Armendáriz LI 2000. The 'new environmental paradigm' in a Mexican community. *Journal of Environmental Education* 31: 25-31.

Corral-Verdugo V & Figueredo 1999. Convergent and divergent validity of three measures of conservation behavior: The Multitrait-Multimethod Approach. *Environment and Behavior* 31: 805-820.

Cottrell SP 2003. Influence of sociodemographics and environmental attitudes on general responsible environmental behaviour among recreational boaters. *Environment and Behaviour* 35: 347-375.

Couclelis H 2009. Rethinking time geography in the information age. *Environment and Planning A* 41: 1556-1575.

Courtenay-Hall P & Rogers L 2002. Gaps in mind: Problems in environmental knowledge-behaviour modelling research. *Environmental Education Research* 8: 283-297.

Crain WC 1985. *Theories of development: Concepts and applications.* 2nd ed. Englewood Cliffs, NJ: Prentice Hall.

Creswell JW 2013. *Research design: Qualitative, quantitative, and mixed methods approaches.* 4th ed. Thousand Oaks: SAGE.

Creswell JW 2014. *A concise introduction to mixed methods research*. Thousand Oaks: SAGE.

Creswell JW & Plano Clark VL 2010. *Designing and conducting mixed methods research*. 2nd ed. Thousand Oaks: SAGE.

Crick-Furman D & Prentice R 2000. Modeling Tourists' Multiple Values. *Annals of Tourism Research* 27: 69-92.

Dale A & Newman L 2005. Sustainable development, education and literacy. *International Journal of Sustainability in Higher Education* 6: 351-362.

Dallago L, Perkins DD, Santinello M, Boyce W, Molcho M & Morgan A 2009. Adolescent place attachment, social capital, and perceived safety: A comparison of 13 countries. *American Journal of Community Psychology* 44: 148-160.

Damerell P, Howe C & Milner-Gulland EJ 2013. Child-orientated environmental education influences adult knowledge and household behaviour. *Environmental Research Letters* 8: 1-7.

Davis B, Rea T & Waite S 2006. The special nature of outdoors: Its contribution to the education of children at aged 3-11. *Australian Journal of Outdoor Education* 10: 3-12.

Derksen L & Gartrell J 1993. The social context of recycling. *American Sociological Review* 58: 434-442.

De Vaus DA 2001. *Research design in social research*. London: SAGE.

Devine-Wright P & Clayton S 2010. Introduction to the special issue: Place, identity and environmental behaviour. *Journal of Environmental Psychology* 30: 267-270.

De Young R 1989. Exploring the differences between recyclers and nonrecyclers: the role of information. *Journal of Environmental Systems* 18: 341-351.

Diamantopoulos A, Schlegelmilch BB, Sinkovics RR, Bohlen GM 2003. Can socio-demographics still play a role in profiling green consumers? A review of the evidence and an empirical investigation. *Journal of Business Research* 56: 465-480.

Diekmann A & Preisendörfer P 1998. Environmental Behavior: Discrepancies between aspirations and reality. *Rationality and Society* 10: 79-102.

Dietz T, Fitzgerald A & Shwom R 2005. Environmental values. *Annual Review of Environment & Resources* 30: 335-372.

Dobbs D 2011. Beautiful brains. *National Geographic* 220: 36-59.

Dono J, Webb J & Richardson B 2010. The relationship between environmental activism, pro-environmental behaviour and social identity. *Journal of Environmental Psychology* 30: 178-186.

Dreyer J & Loubser C 2005. Curriculum development, teaching and learning for the environment. In Loubser CP (ed) *Environmental education: Some South African Perspectives,* 127-153. Cape Town: Van Schaik Publisher.

Dunlap RE 2008. The new environmental paradigm scale: From marginality to worldwide use. *The Journal of Environmental Education* 40: 3-18.

Dunlap RE & Catton WR 1979. Environmental sociology. *Annual Review of Sociology* 5: 243-273.

Dunlap RE & Mertig AG 1997. Global environmental concern: An anomaly for postmaterialism. *Social Science Quarterly* 78: 24-29.

Dunlap RE & Van Liere KD 1978. The new environmental paradigm. *Journal of Environmental Education* 9: 10-19.

Dunlap RE & Van Liere KD 1984. Commitment to the dominant social paradigm and concern for environmental quality. *Social Science Quarterly* 65: 1013-1028.

Dunlap RE & York R 2008. The globalization of environmental concern and the limits of the postmaterialist values explanation: Evidence from four multinational surveys. *The Sociological Quarterly* 49: 529-563.

Dunlap RE, Van Liere KD, Mertig AG & Jones RE 2000. Measuring endorsement of the new ecological paradigm: A revised NEP scale. *Journal of Social Issues* 56: 425-442.

Durant RF & Legge JS 2005. Public opinion, risk perceptions, and genetically modified food regulatory policy reassessing the calculus of dissent among European citizens. *European Union Politics* 6: 181-200.

Durkheim E 1956. *Education and sociology*. Glencoe: Free Press.

Dwyer WO, Leeming FC, Cobern MK, Porter BE & Jackson JM 1993. Critical review of behavioral interventions to preserve the environment: Research since 1980. *Environment and Behavior* 25: 485-505.

Eagly AH 1987. *Sex differences in social behavior: A social role interpretation*. Hillsdale: Erlbaum.

Eagly AH & Chaiken S 1993. *The psychology of attitudes*. Toronto, Canada: Harcourt Brace Jovanovich.

Eckersley R 1992. *Environmentalism and political theory: Toward an ecocentric approach*. New York: State University of New York Press.

Edwards J 2011. Towards effective socially critical environmental education: Stories from primary classrooms. Doctoral dissertation. Melbourne: Royal Melbourne Institute of Technology, School of Education.

Eija Y, Elisabeth G & Varpu E 2012. School children´s drawings of landscape they would like to conserve and how the drawings reflect their environmental conceptions. Paper delivered at Australian Association for Research in Education conference, Sydney.

Eilam E & Trop T 2010. ESD pedagogy: A guide for the perplexed. *The Journal of Environmental Education* 42: 43-64.

Eilam E & Trop T 2012. Environmental attitudes and environmental behavior—Which is the horse and which is the cart? *Sustainability* 4: 2210-2246.

Eisenhardt KM 1989. Building theories from case study research. *Academy of Management Review* 14: 532-550.

Eloranta V & Yli-Panula E 2005. Animals in the drawings of the landscape by Finnish and Russian young people in the landscape they want to conserve. *Nordic Studies in Science Education* 2: 5-17.

Enviroteach 1995. *Investigating of opportunities for the implementation of Enviroteach programmes in Namibia colleges of education.* Windhoek: DRFN.

Erindi Private Game Reserve 2015. One of the most amazing conservation areas on earth [online]. Available from: http://www.erindi.com/ [Accessed 15 June 2015].

Evans G & Durant J 1995. The relationship between knowledge and attitudes in the public understanding of science in Britain. *Public Understanding of Science* 4: 57-74.

Evans GW, Brauchle G, Haq A, Stecker R, Wong K & Shapiro E 2007. Young children's environmental attitudes and behaviors. *Environment and Behavior* 39: 635-659.

Fahlquist JN 2009. Moral responsibility for environmental problems—individual or institutional? *Journal of Agricultural and Environmental Ethics* 22: 109-124.

Fairhurst UJ, Davies RJ, Fox RC, Ramutsindela MR, Goldschagg P, Bob U & Khosa MM 2003. Geography: The state of the discipline in South Africa: Survey, 2000/2001-Report. Pretoria: Society of South African Geographers.

Farokhi M & Hashemi M 2011. The analysis of children's drawings: Social, emotional, physical, and psychological aspects. *Procedia-Social and Behavioral Sciences* 30: 2219-2224.

Felizer MY 2010. Doing mixed methods research pragmatically: Implications for the rediscovery of pragmatism as a research paradigm. *Journal of Mixed Methods Research* 4: 6-16.

Fennell D 2006. *Tourism ethics, aspects of tourism*. Clevedon, England: Channel View Publications.

Fietkau HJ & Kessel H 1981. *Umweltlernen: Veraenderungsmoeglichkeite n des Umweltbewusstseins*. Koenigstein: Hain.

Fishbein M & Ajzen I 1975. *Belief, attitude, intention, and behavior: An introduction to theory and research.* Reading: Addison-Wesley.

Fisher J 1993. *The road from Rio: Sustainable development and the nongovernmental movement in the third world*. Westport: Praeger.

Fleer M 2002. Curriculum compartmentalisation? A futures perspective on environmental education. *Environmental Education Research* 8: 137-154.

Fransson N & Gärling T 1999. Environmental concern: Conceptual definitions, measurement methods, and research findings. *Journal of Environmental Psychology* 19: 369-382.

Franzen A 2003. Environmental attitudes in international comparison: An analysis of the ISSP surveys 1993 and 2000. *Social Science Quarterly 84*: 297-308.

Franzen A & Meyer R 2010. Environmental attitudes in cross-national perspective: A multilevel analysis of the ISSP 1993 and 2000. *European Sociological Review* 26: 219-234.

Fried M 1963. Grieving for a lost home. In Duhl LJ (ed) *The urban condition: People and policy in the metropolis*, 124-152. New York: Simon & Schuster.

Fuhrer U, Kaiser FG, Seiler I & Maggi M 1995. From social representations to environmental concern: The influence of face-to-face versus mediated communication. In Fuhrer U (ed) *Ökologisches Handeln als sozialer Prozeß,* 61-75. Basel: Birkhäuser.

Gambro JS & Switzky HN 1996. A national survey of high school students' environmental knowledge. *The Journal of Environmental Education* 27: 28-33.

Gardner GT & Stern PC 1996. *Environmental problems and human behavior*. Boston: Allyn & Bacon.

Gatersleben B, Steg L & Vlek C 2002. Measurement and determinants of environmentally significant consumer behavior. *Environment and behaviour* 34: 335-362.

Gauntlett D 2007. *Creative explorations: New approaches to identities and audiences*. London: Routledge.

Geller ES 1990. Behavior analysis and environmental protection: Where have all the flowers gone? *Journal of Applied Behavior Analysis* 23: 269-273.

Geller ES 1995. Actively caring for the environment -an integration of behaviorism and humanism. *Environment and Behavior* 27: 184-195.

Geller ES, Winett RA & Everett PB 1982. *Environmental preservation: New strategies for behavior change.* New York: Pergamon Press.

Georg S 1999. The social shaping of household consumption. *Ecological Economics* 28: 455-466.

Giarelli E & Tulman L 2003. Methodological issues in the use of published cartoons as data. *Qualitative Health Research* 13: 945-956.

Gibbs DC, Longhurst J, Braithwaite C 1998. 'Struggling with sustainability': Weak and strong interpretations of sustainable development within local authority policy. *Environment and Planning A* 30: 1351-1365.

Gifford R & Nilsson A 2014. Personal and social factors that influence pro-environmental concern and behaviour: A review. *International Journal of Psychology* 49: 141-157.

Gilligan C 1982. *In a different voice: Psychological theory and women's development*. Cambridge: Harvard University Press.

Golledge RG, Gale N, Pellegrino JW, Doherty S 1992. Spatial knowledge acquisition by children: Route learning and relational distances. *Annals of the Association of American Geographers* 82: 223-244.

Gosling E & Williams KJ 2010. Connectedness to nature, place attachment and conservation behaviour: Testing connectedness theory among farmers. *Journal of Environmental Psychology* 30: 298-304.

Government of the Republic of Namibia 2013. *Millennium development goals.* Interim Progress Report No 2013/4. Windhoek: The National Planning Commission.

Graham AH 2014. 52 places to go in 2014: Namibia [online]. Available from: http://www.nytimes.com/interactive/2014/01/10/travel/2014-places-to-go.html?_r=0 [Accessed 20 March 2014].

Granzin KL & Olsen JE 1991. Characterizing participants in activities protecting the environment: A focus on donating, recycling, and conservation behaviors. *Journal of Public Policy & Marketing* 10, 2: 1-27.

Gravetter F & Forzano LA 2015. *Research methods for the behavioral sciences*. 4th ed. Belmont: Wadsworth Cenage Learning.

Greene JC 2007. *Mixed methods in social inquiry.* San Francisco: Jossey-Bass.

Grob A 1995. A structural model of environmental attitudes and behaviour. *Journal of Environmental Psychology* 15: 209-220.

Grønhøj A & Thøgersen J 2009. Like father, like son? Intergenerational transmission of values, attitudes, and behaviours in the environmental domain. *Journal of Environmental Psychology* 29: 414-421.

Grønhøj A & Thøgersen J 2012. Action speaks louder than words: The effect of personal attitudes and family norms on adolescents' pro-environmental behaviour. *Journal of Economic Psychology* 33: 292-302.

Guagnano GA 1995. Locus of control, altruism and agentic disposition. *Population and Environment: A Journal of Interdisciplinary Studies* 17: 63-77.

Guha R & Martinez-Alier JM 1997. *Varieties of environmentalism: Essays North and South.* London: Earthscan

Guha R & Martinez-Alier JM 2013. *Varieties of environmentalism: Essays North and South*. London: Earthscan.

Günindi Y 2012. Environment in my point of view: Analysis of the perceptions of environment of the children attending to kindergarten through the pictures they draw. *Procedia-Social and Behavioral Sciences* 55: 594-603.

Gustafson P 2001. Meanings of place: Everyday experience and theoretical conceptualizations. *Journal of Environmental Psychology* 21: 5-16.

Halpenny EA 2006. Environmental behaviour, place attachment and park visitation: a case study of visitors to Point Pelee National Park. Doctoral dissertation. Waterloo: University of Waterloo, Recreation and Leisure Studies.

Halpenny EA 2010. Pro-environmental behaviours and park visitors: The effect of place attachment. *Journal of Environmental Psychology* 30: 409-421.

Hardin G 1968. The tragedy of the commons. *Science* 162: 1243-1248.

Hargreaves T 2011. Practice-ing behaviour change: Applying social practice theory to pro-environmental behaviour change. *Journal of Consumer Culture* 11: 79-99.

Hargreaves T 2012. Questioning the virtues of pro-environmental behaviour research: Towards a phronetic approach. *Geoforum* 43: 315-324.

Haron SA, Paim L & Yahaya N 2005. Towards sustainable consumption: An examination of environmental knowledge among Malaysians. *International Journal of Consumer Studies* 29: 426-436.

Harris PB, Werner CM, Brown BB & Ingebritsen D 1995. Relocation and privacy regulation: A cross-cultural analysis. *Journal of Environmental Psychology* 15: 311–320.

Harrits GS 2011. More than method? A discussion of paradigm differences within mixed methods research. *Journal of Mixed Methods Research* XX(X): 1-17.

Harvey, M. R. (1989). The relationship between children's experiences with vegetation on school grounds and their environmental attitudes. *Journal of Environmental Education* 21: 9-15.

Hausbeck KW, Milbrath LW & Enright SM 1992. Environmental knowledge, awareness and concern among 11th-grade students: New York State. *The Journal of Environmental Education* 24: 27-34.

Hawthorne M & Alabaster T 1999. Citizen 2000: Development of a model of environmental citizenship. *Global Environmental Change* 9: 25-34.

Hays PA 2003. Case study approach. In deMarrais K & Lapan SD (eds) *Foundations for research: Methods of inquiry in education and the social sciences,* 217-234. New York: Routledge.

He X, Hong T, Liu L & Tiefenbacher J 2011. A comparative study of environmental knowledge, attitudes and behaviors among university students in China. *International Research in Geographical and Environmental Education* 20: 91-104.

Heberlein TA & Black JS 1976. Attitudinal specificity and the prediction of behavior in a field setting. *Journal of Personality and Social Psychology* 33: 474-479.

Hedlund T 2011. The impact of values, environmental concern, and willingness to accept economic sacrifices to protect the environment on tourists' intentions to buy ecologically sustainable tourism alternatives. *Tourism and Hospitality Research* 11: 278-288.

Heft H 1988. Affordances of children's environments: A functional approach to environmental description. *Children's Environments Quarterly* 5: 29-37.

Heimlich JE 2010. Environmental education evaluation: Reinterpreting education as a strategy for meeting mission. *Evaluation and Program planning* 33: 180-185.

Hernández B, Martín AM, Ruiz C & Hidalgo MC 2010. The role of place identity and place attachment in breaking environmental protection laws. *Journal of Environmental Psychology* 30: 281-288.

Hidalgo MC & Hernández B 2001. Place attachment: Conceptual and empirical questions. *Journal of Environmental Psychology* 21: 273-281.

Hines JM, Hungerford HR & Tomera AN 1986/87. Analysis and synthesis of research on responsible environmental behavior: A meta-analysis. *Journal of Environmental Education* 18, 2: 1-8.

Hobsbawm E 1994. *The age of extremes.* London: Michael Joseph.

Hobson K 2002. Competing discourses of sustainable consumption: Does the 'rationalisation of lifestyles' make sense? *Environmental Politics* 11: 95–120.

Hodgkinson S & Innes J 2000. The prediction of ecological and environmental belief systems: The differential contributions of social conservatism and beliefs about money. *Journal of Environmental Psychology* 20: 285-294.

Holbert LR, Kwak N & Shah DV 2003. Environmental concerns, patterns of television viewing, and pro-environmental behaviors: Integrating models of media consumption and effects. *Journal of Broadcasting and Electronic Media* 47: 177-196.

Holloway A & Roomaney R 2008. *Weathering the storm: Participatory risk assessment for informal settlements*. Cape Town: Periperi Publications.

Homburg A & Stolberg A 2006. Explaining pro-environmental behavior with a cognitive theory of stress. *Journal of Environmental Psychology* 26, 1: 1-14.

Hoye M CNN International 2014. White House and China set historic greenhouse emissions levels [online]. Available from: http://edition.cnn.com/2014/11/11/politics/us-china-climate-change-agreement/index.html?hpt=hp_t1 [Accessed 20 December 2014].

Huang H & Yore L 2003. A comparative study of Canadian and Taiwanese grade 5 children's environmental behaviours, attitudes, concerns, emotional dispositions, and knowledge. *International Journal of Science and Mathematics* 1: 419-448.

Huddart-Kennedy E, Beckley TM, McFarlane BL & Nadeau S 2009. Rural-urban differences in environmental concern in Canada. *Rural Sociology* 74: 309-329.

Hummon DM 1992. Community attachment. *Human Behavior and Environment* 12: 253-278

Hungerford HR & Volk TL 1990. Changing learner behavior through environmental education. *The Journal of Environmental Education* 21: 8-21.

Hunter LM, Hatch A & Johnson A 2004. Cross-national gender variation in environmental behaviors. *Social Science Quarterly* 85: 677-694.

Hunter LM, Strife S & Twine W 2010. Environmental perceptions of rural South African residents: The complex nature of environmental concern. *Society & Natural Resources: An International Journal* 23: 525-541.

Hutchinson AM & Johnston L 2004. Bridging the divide: a survey of nurses' opinions regarding barriers to, and facilitators of, research utilization in the practice setting. *Journal of Clinical Nursing* 13: 304-315.

Ignatow G 2006. Cultural models of nature and society reconsidering environmental attitudes and concern. *Environment and Behavior* 38: 441-461.

IGU (International Geographical Union) 2009. International Charter on Geographical Education [online]. Available from: http://www.igu-cge.org/charters_1.htm [Accessed 12 February 2014].

Imene SN 2010. Enviroteach Project and Environmental Education in Namibia [online]. Available from: http://www.nied.edu.na/publications/journals/journal10/Journal%2010%20Article%207.pdf [Accessed 16 April 2015].

Imran S, Alam K & Beaumont N 2014. Environmental orientations and environmental behaviour: Perceptions of protected area tourism stakeholders. *Tourism Management* 40: 290-299.

Inglehart R 1990. *Culture shift in advanced industrial society*. Princeton: Princeton University Press.

Ittelson WH, Proshansky HM, Rivlin LG & Winkel GH 1974. *An introduction to environmental psychology*. New York: Holt, Rinehart & Winston.

Jakle JA, Brunn S & Roseman CC 1976. *Human spatial behaviour: A social geography*. Duxbury: Waveland Press.

James S, Morgan M & Madsen MN 1997. Green or brown? Television and the cultivation of environmental concern. *Journal of Broadcasting & Electronic Media* 41: 305-323.

Jensen BB 2002. Knowledge, action and pro-environmental behaviour. *Environmental Education Research* 8: 325-334.

Johnson CY, Bowker JM & Cordell HK 2004. Ethnic variation in environmental belief and behavior: An examination of the new ecological paradigm in a social psychological context. *Environment and Behavior* 36: 157-186.

Johnson RB & Onwuegbuzie AJ 2004. Mixed methods research: A research paradigm whose time has come. *Educational researcher* 33: 14-26.

Johnson RB, Onwuegbuzie AJ & Turner LA 2007. Toward a definition of mixed methods research. *Journal of Mixed Methods Research* 1: 112-133.

Joling D 2014. About 35,000 walruses gather on Alaska beach due to lack of sea ice [online]. Available from: http://globalnews.ca/news/1592488/about-35000-walruses-gather-on-alaska-beach-due-to-lack-of-sea-ice/ [Accessed on 20 October 2014].

Jones RE & Carter LF 1994. Concern for the environment among Black Americans: An assessment of common assumptions. *Social Science Quarterly* 75: 560-579.

Jones RE, Fly JM, Talley J & Cordell HK 2003. Green migration into rural America: The new frontier of environmentalism? *Society & Natural Resources: An International Journal* 16: 221-238.

Jorgensen BS & Stedman RC 2001. Sense of place as an attitude: Lakeshore owners attitudes toward their properties. *Journal of Environmental Psychology* 21: 233-248.

Kahn PH & Lourenço O 2002. Water, air, fire, and earth: A developmental study in Portugal of environmental moral reasoning. *Environment and Behavior* 34: 405-430.

Kaira C 2014. Population to grow by 63%, hitting 3,4 million in 2041 [online]. Available from: http://www.namibian.com.na/indexx.php?archive_id=128833&page_type=archive_story_detail&page=1 [Accessed 12 March 2015].

Kaiser FG & Fuhrer U 2003. Ecological behavior's dependency on different forms of knowledge. *Applied Psychology* 52: 598-613.

Kaiser FG, Ranney M, Hartig T & Bowler PA 1999. Ecological behavior, environmental attitude, and feelings of responsibility for the environment. *European Psychologist* 4: 59-74.

Kals E, Schumacher D & Montada L 1999. Emotional affinity toward nature as a motivational basis to protect nature. *Environment and Behavior* 31: 178-202.

Kaltenborn BP 1997. Nature of place attachment: A study among recreation homeowners in Southern Norway. *Leisure Sciences* 19: 175-189.

Kaltenborn BP & Williams DR 2002. The meaning of place: Attachments to Femundsmarka National Park, Norway, among tourists and locals. *Norsk Geografisk Tidsskrift* 56: 18-198.

Kalvaitis D & Monhardt RM 2012. The architecture of children's relationships with nature: A phenomenographic investigation seen through drawings and written narratives of elementary students. *Environmental Education Research* 18: 209-227.

Kambowe K 2015. Garden Town in the dumps [online]. Available from: http://www.namibiansun.com/local-news/garden-town-in-dumps.81035#slide-2-field_images-81035 [Accessed 22 July 2015].

Kanagy CL, Humphrey CR, & Firebaugh G 1994. Surging environmentalism: Changing public opinion or changing publics? *Social Science Quarterly* 75: 805-819.

Kanyimba AT 2009. The incorporation of environmental education for sustainability in the Namibian colleges of education. Doctoral dissertation. University of South Africa, Didactics.

Kaplan S 2000. New ways to promote proenvironmental behavior: Human nature and environmentally responsible behavior. *Journal of Social Issues* 56: 491-508.

Karp DG 1996. Values and their effect on pro-environmental behavior. *Environment and Behavior* 28: 111-133.

Kassas M 2002. Environmental education: Biodiversity. *Environmentalist* 22: 345-351.

Kearney AR & De Young R 1995. A knowledge-based intervention for promoting carpooling. *Environment and Behavior* 27: 650-678.

Keating DP & Hertzman C (eds) 1999. *Developmental health and the wealth of nations: Social, biological, and educational dynamics*. New York: Guilford Press.

Kelbessa W 2005. The rehabilitation of indigenous environmental ethics in Africa. *Diogenes* 52: 17-34.

Kellert SR 1997. Kinship to mastery: Biophilia in human evolution and development. Washington, DC: Island Press

Kellert SR 2012. *Building for life: Designing and understanding the human-nature connection*. Covelo: Island Press

Kellgren CA &Wood W 1986. Access to attitude-relevant information in memory as a determinant of attitude-behavior consistency. *Journal of Experimental Social Psychology* 22: 328-338.

Kellstedt PM, Zahran S & Vedlitz A 2008. Personal efficacy, the information environment, and attitudes toward global warming and climate change in the United States. *Risk Analysis* 28: 113-126.

Kempton W, Boster JS, Hartley JA 1995. *Environmental values in American culture.* Cambridge, MA: MIT Press.

Kennedy EH, Beckley TM, McFarlane BL & Nadeau S 2009. Why we don't "walk the talk": Understanding the environmental values/behaviour gap in Canada. *Human Ecology Review* 16: 151-160.

King LD 1995. *Doing their share to save the planet: Children and environmental crisis.* New Jersey: Rutgers University Press.

Kitahara R & Matsuishi T 2008. Research on children's drawings [online]. Available from: http://www.medico-pedagogy.org/childrenpicturesummaryJ_Ewp.pdf [Accessed 15 March 2015].

Kitzinger J 1994. The methodology of focus groups: the importance of interaction between research participants. *Sociology of Health & Illness* 16: 103-121.

Kleiber 2003. Focus groups: More than a method of qualitative inquiry. In deMarrais K & Lapan SD (eds) *Foundations for research: Methods of inquiry in education and the social sciences,* 87-102. New York: Routledge.

Klöckner CA 2013. A comprehensive model of the psychology of environmental behaviour—A meta-analysis. *Global Environmental Change* 23: 1028-1038.

Knapp D 2000. The Thessaloniki Declaration: A wake-up call for environmental education?. *The Journal of Environmental Education* 31: 32-39.

Knight KW & Messer BL 2012. Environmental concern in cross-national perspective: The effects of affluence, environmental degradation, and world society. *Social Science Quarterly* 93: 521-537.

Kola-Olusanya A 2005. Free-choice environmental education: understanding where children learn outside of school. *Environmental Education Research* 11: 297-307.

Kollmuss A & Agyeman J 2002. Mind the gap: Why do people act environmentally and what are the barriers to pro-environmental behavior? *Environmental Education Research* 8: 239-260.

Kopnina H 2012. Education for sustainable development (ESD): The turn away from 'environment' in environmental education? *Environmental Education Research* 18: 699-717.

Korkeila J, Vahtera J, Nabi H, Kivimäki M, Korkeila K, Sumanen M, Koskenvuo K & Koskenvuo M 2010. Childhood adversities, adulthood life events and depression. *Journal of Affective Disorders* 127: 130-138.

Kortenkamp KV & Moore CF 2001. Ecocentrism and anthropocentrism: Moral reasoning about ecological commons dilemmas. *Journal of Environmental Psychology* 21: 261-272.

Koziell I & Saunders J (eds) 2001. *Living off biodiversity: Exploring livelihoods and biodiversity issues in natural resources management*. London: International Institute for Environment and Development.

Kreger J 1973. Ecology and black student opinion. *The Journal of Environmental Education* 4: 30-34.

Krueger RA & Casey MA 2009. *Focus Groups: A practical guide for applied research.* 4th ed. Los Angeles: SAGE.

Kudryavtsev A, Stedman RC & Krasny ME 2012. Sense of place in environmental education. *Environmental Education Research* 18: 229-250.

Kumar R 1999. *Research methodology: A step-by-step guide for beginners.* London: SAGE.

Kyle G & Chick G 2007. The social construction of a sense of place. *Leisure Sciences* 29: 209-225.

Kyle G, Graefe A, Manning R & Bacon J 2003. An examination of the relationship between leisure activity involvement and place attachment among hikers along the Appalachian Trail. *Journal of Leisure Research* 35: 249-273.

Lark-Horovitz B & Norton J 1960. Children's art abilities: The interrelations and factorial structure of ten characteristics. *Child Development* 31: 453-462.

Laroche M, Bergeron J & Barbaro-Forleo G 2001. Targeting consumers who are willing to pay more for environmentally friendly products. *Journal of Consumer Marketing* 18: 503-520.

Lee K 2011. The role of media exposure, social exposure and biospheric value orientation in the environmental attitude-intention-behavior model in adolescents. *Journal of Environmental Psychology* 31: 301-308.

Le Grange 2002. Towards a "language of probability" for environmental education in South Africa. *South African Journal of Education* 22: 83-87.

Lehman PK & Geller ES 2005. Behavior analysis and environmental protection: Accomplishments and potential for more. *Behavior and Social Issues* 13: 13-32.

Lewis D & Greene J 1983. *Your child's drawings ... their hidden meaning.* London: Hutchinson.

Lindemann-Matthies P 2006. Investigating nature on the way to school: Responses to an educational programme by teachers and their pupils. *International Journal of Science Education* 28: 895-918.

Lindenberg S & Steg L 2007. Normative, gain and hedonic goal frames guiding environmental behavior. *Journal of Social Issues* 63: 117-137.

Literat I 2013. "A pencil for your thoughts": Participatory drawing as a visual research method with children and youth. *International Journal of Qualitative Methods* 12: 84-98.

LoBiondo-Wood G & Haber J 2014. *Nursing Research: Methods, critical appraisal and utilization.* 8th ed. Mosby, St Louis: Elsevier.

Loebach JE 2013. Children's neighbourhood geographies: Examining children's perception and use of their neighbourhood environments for healthy activity. Doctoral dissertation. Ontario: University of Western Ontario, Graduate Program in Geography.

Lonely Planet 2015. Best in Travel 2015: #2 Namibia [online]. Available from: http://www.lonelyplanet.com/best-in-travel/countries/02-namibia [Accessed on 14 January 2015].

Loubser CP 1992. Environmental education: A field of study to be taught as subject during teacher training. *Educare* 21: 90-96.

Loughland T, Reid A, Walker K & Petocz P 2003. Factors influencing young people's conceptions of environment. *Environmental Education Research* 9: 3-20.

Louw AE & Louw DA 2007. *Die ontwikkeling van die kind en adolessent*. Bloemfontein: Routledge.

Lynn P 2014. Distinguishing dimensions of pro-environmental behaviour. *Institute for Social and Economic Research* 19: 1-19.

Lyons E & Breakwell GM 1994. Factors predicting environmental concern and indifference in 13- to 16-year-olds. *Environment and Behavior* 26: 223-238.

Macnaghten P & Jacobs M 1997. Public identification with sustainable development: Investigating cultural barriers to participation. *Global Environmental Change* 7: 5-24.

Mahiri I 1998. *Comparing transect walks with experts and local people.* (CD ROM). London: University of Durham.

Mainieri T, Barnett EG, Valdero TR, Unipan JB & Oskamp S 1997. Green buying: The influence of environmental concern on consumer behavior. *The Journal of Social Psychology* 137: 189-204.

Maio GR, Verplanken B, Manstead AS, Stroebe W, Abraham C, Sheeran P & Conner M 2007. Social psychological factors in lifestyle change and their relevance to policy. *Social Issues and Policy Review* 1: 99-137.

Mair J & Laing JH 2013. Encouraging pro-environmental behaviour: The role of sustainability-focused events. *Journal of Sustainable Tourism* 21: 1113-1128.

Makki MH, Abd-El-Khalick F & BouJaoude S 2003. Lebanese secondary school students' environmental knowledge and attitudes. *Environmental Education Research* 9: 21-33.

Malchiodi CA 1998. *Understanding children's drawings*. New York: Guilford Press.

Malina MA, Nørreklit HS & Selto FH 2011. Lessons learned: Advantages and disadvantages of mixed method research. *Qualitative Research in Accounting & Management* 8: 59-71.

Maloney MP & Ward MP 1973. Ecology: Let's hear from the people: An objective scale for the measurement of ecological attitudes and knowledge. *American Psychologist* 28: 583: 586.

Maloney MP, Ward MP & Braucht GN 1975. A revised scale for the measurement of ecological attitudes and knowledge. *American Psychologist* 30: 787-790.

Manoli CC, Johnson B & Dunlap RE 2007. Assessing children's environmental worldviews: Modifying and validating the new ecological paradigm scale for use with children. *The Journal of Environmental Education* 38: 3-13.

Manzo LC 2005. For better or worse: Exploring multiple dimensions of place meaning. *Journal of Environmental Psychology* 25: 67-86.

Markowitz EM, Goldberg LR, Ashton MC & Lee K 2012. Profiling the "pro-environmental individual": A personality perspective. *Journal of Personality* 80: 81-111.

Matthews H 1984. Cognitive mapping abilities of young boys and girls. *Geography* 69: 327-336.

Matthews MH 1985. Young children's representations of the environment: a comparison of techniques. *Environmental Psychology* 5: 261-278.

Matthews HM 1992. *Making sense of place: Children's understanding of large-scale environments.* Hemel Hempstead: Harvester Wheatsheaf.

Matthews MH 1995. Living on the edge: Children as outsiders. *Tijdschrift voor Economische Sociale Geographie* 86: 456-466.

Matthews H & Limb M 1999. Defining an agenda for the geography of children: Review and prospect. *Progress in Human Geography* 23: 61-90.

Maxwell JA 2013. *Qualitative research design: An interactive approach*. 3rd ed. London: SAGE.

Mayer FS & Frantz CM 2004). The connectedness to nature scale: A measure of individuals' feeling in community with nature. *Journal of Environmental Psychology* 24: 503-515.

McCarty JA & Shrum LJ 2001. The influence of individualism, collectivism, and locus of control on environmental beliefs and behavior. *Journal of Public Policy & Marketing* 20: 93-104.

McCright AM, Xiao C & Dunlap RE 2014. Political polarization on support for government spending on environmental protection in the USA, 1974-2012. *Social Science Research* 48: 251-260.

McKeown-Ice R 1994. Environmental education: A geographical perspective. *Journal of Geography* 93: 40-42.

McKeown R & Hopkins C 2003. EE ≠ ESD: Defusing the worry. *Environmental Education Research* 9: 117–28.

McStay J & Dunlap RE 1983. Male-female differences in concern for environmental quality. *International Journal of Women's Studies* 6: 291-301.

Meaney MJ 2001. Maternal care, gene expression, and the transmission of individual differences in stress reactivity across generations. *Annual Review of Neuroscience* 24: 1161-1192.

Meinhold JL & Malkus AJ 2005. Adolescent environmental behaviors: Can knowledge, attitudes and self- efficacy make a difference? *Environment and Behavior* 37: 511-532.

Menon A, Menon A, Chowdhury J & Jankovich J 1999. Evolving paradigm for environmental sensitivity in marketing programs: A synthesis of theory and practice. *Journal of Marketing Theory and Practice* 7: 1-15.

Merchant C 1990. Environmental ethics and political conflict: A view from California. *Environmental Ethics* 12: 45-68.

Mertig AG & Dunlap RE 2001. Environmentalism, new social movements, and the new class: A cross-national investigation. *Rural Sociology* 66: 113-136.

MET (Ministry of Environment and Tourism) 2006. *Vital signs of Namibia 2004: An integrated state of the environment report.* Windhoek: Ministry of Environment and Tourism.

MET (Ministry of Environment and Tourism) 2014. Fifth National Report to the Convention on Biological Diversity (2010-2014) [online]. Available from: https://www.cbd.int/doc/world/na/na-nr-05-en.pdf [Accessed 15 June 2015].

Michelson WH 1976. *Man and his urban environment*. 2nd ed. Reading: Addison-Wesley.

Milbrath LW 1989. *Envisioning a sustainable society: Learn our way out.* New York: State University of New York Press.

Millar D 1999. Traditional African worldviews from a cosmovision perspective. In Haverkort B & Hiemstra W (eds) *Food for thought: Ancient visions and new experiments of rural people*, 131-138. London: Zed Books.

Miller RM 2008. *The geology of Namibia*. Windhoek: Geological Survey of Namibia.

Milligan MJ 1998. Interactional past and potential: The social construction of place attachment. *Symbolic Interaction* 21: 1-33.

Ministry of Basic Education and Culture 1993. *Towards education for all: A development brief for education, culture and training.* Windhoek: Gamsberg Macmillan Publishers.

Ministry of Basic Education and Culture 1998. *Pilot curriculum guide for formal senior secondary education.* National Institute for Educational Development/ Ministry of Education and Culture. Okahandja: NIED.

Ministry of Basic Education, Sport and Culture 1996. *Pilot curriculum guide for formal basic education*. Okahandja: NIED.

Mitchell C, Theron L, Stuart J, Smith A & Campbell Z 2011. Drawings as Research Method. In Theron L, Mitcell C, Smith A & Stuart J (eds) *Picturing research: Drawing as visual methodology*, 19-36. Rotterdam: Sense Publishers.

Mobley C, Vagias WM, DeWard SL 2010. Exploring additional determinants of environmentally responsible behaviour: The influence of environmental literature and environmental attitudes. *Environmental Behaviour* X, X: 1-28.

MoE (Ministry of Education) 2010a. *Junior secondary phase: Life science syllabus grades 8-10*. Okahandja: NIED.

MoE (Ministry of Education) 2010b. *Junior secondary phase: Geography syllabus grades 8-10*. Okahandja: NIED.

Mohai P 1992. Men, women, and the environment: An examination of the gender gap in environmental concern and activism. *Society & Natural Resources: An International Journal* 5: 1-19.

Mohai P & Bryant B 1998. Is there a "race" effect on concern for environmental quality? *Public Opinion Quarterly* 62: 475-505.

Mohai P & Twight BW 1987. Age and environmentalism: An elaboration of the Buttel model using national survey evidence. *Social Science Quarterly* 68: 798-815.

Monela GC, Zahabu E, Malimbwi RE, Jambiya G & Misana S 1999. Socio-economics of charcoal extraction in Tanzania: A case of Eastern Part of Tanzania [online]. Available from:
http://www.tfcg.org/pdf/Socio%20economics%20of%20charcoal%20production.pdf
[Accessed 8 May 2015].

Monroe M 1994. *Environmental education and communication inventory for Namibia*. Washington DC: Academy for Educational Development.

Monroe MC 2003. Two avenues for encouraging conservation behaviors. *Human Ecology Review* 10: 113-125.

Moore RL & Graefe AR 1994. Attachment to eecreational settings: The case of rail trail users. *Leisure Science* 16: 17-31.

Moore RL & Scott D 2003. Place attachment and context: Comparing a park and a trail within. *Forest Science* 49: 877-884.

Mosler HJ 1993. Self-dissemination of environmentally-responsible behavior: The influence of trust in a commons dilemma game. *Journal of Environmental Psychology* 13: 111-123.

Mostafa MM 2007. Gender differences in Egyptian consumers' green purchase behaviour: The effects of environmental knowledge, concern and attitude. *International Journal of Consumer Studies* 31: 220-229.

Moyo S, O'Keefe P & Sill M 1993. *The southern African environment: Profiles of the SADC countries.* New York: Earthscan.

Nagel M 2005. Constructing apathy: How environmentalism and environmental education may be Fostering 'learned hopelessness' in children. *Australian Journal of Environmental Education* 21: 71-80.

Namibia (Republic of) 1998. The Constitution of the Republic of Namibia [online]. Available from: http://www.gov.na/documents/10181/14134/Namibia_Constitution.pdf/37b70b76-c15c-45d4-9095-b25d8b8aa0fb [Accessed 18 April 2015].

Namibian Sun 2015. Fear stalks Dom Lokasie [online]. Available from: http://m.sun.com.na/local-news/fear-stalks-dom-lokasie [Accessed 24 June 2015].

National Geographic 2015. Education: Geography [online]. Available from: http://education.nationalgeographic.com/education/encyclopedia/geography/ [Accessed 15 May 2015].

Nations Online Project 2015. Political map of Namibia [online]. Available from: http://www.nationsonline.org/oneworld/map/namibia-political-map.htm [Accessed 10 February 2015].

NEEN (Namibia Environmental Education Network) 2004. *An environmental education policy for Namibia*. Windhoek: SEEN/NIED.

Neuman WL 1994. *Social Research Methods: Qualitative and Quantitative Approaches*. Boston: Allyn and Bacon.

Newman I & Benz CR 1998. *Qualitative-quantitative research methodology: Exploring the interactive continuum.* Carbondale: Southern Illinois University Press.

Nooney JG, Woodrum E, Hoban TJ & Clifford WB 2003. Environmental worldview and behavior consequences of dimensionality in a survey of North Carolinians. *Environment and Behavior* 35: 763-783.

Nordlund AM & Garvill J 2002. Value structures behind proenvironmental behavior. *Environment and Behavior* 34: 740-756.

Nordlund AM & Garvill J 2003. Effects of values, problem awareness, and personal norm on willingness to reduce personal car use. *Journal of environmental psychology* 23: 339-347.

NSA (Namibia Statistics Agency) 2014. Okahandja Census information. Windhoek: Namibia Statistics Agency.

Nye M & Hargreaves T 2009. Exploring the social dynamics of proenvironmental behavior change: A comparative study of intervention processes at home and work. *Journal of Industrial Ecology* 14: 137-149.

Ogunbode CA 2013. The NEP scale: measuring ecological attitudes/worldviews in an African context. *Environment, development and sustainability* 15: 1477-1494.

Oğuz V 2010. The factors influencing childrens' drawings. *Procedia-Social and Behavioral Sciences* 2: 3003-3007.

Oğuz D, Çakci I & Kavas S 2010. Environmental awareness of university students in Ankara, Turkey. *African Journal of Agricultural Research* 5: 2629-2636.

Okahandja Municipality 2009. *History of Okahandja.* Okahandja: Okahandja Municipality.

Okahandja Municipality 2014. Okahandja Municipality: Garden Town of Namibia [online]. Available from: http://www.okahandja.org.na/ [Accessed 12 January 2015].

Okahandja Online 2015. Okahandja Online: Garden Town of Namibia [online]. Available from: http://www.okahandja.net/hunting/default.html [Accessed 20 July 2015].

Olli E, Grendstad G & Wollebaek D 2001. Correlates of environmental behaviors: Bringing back social context. *Environment and Behavior* 33: 181-208.

Olson J & Zanna M 1993. Attitudes and attitude change. *Annual Review of Psychology* 44: 117-154.

Osbaldiston R & Sheldon KM 2003. Promoting internalized motivation for environmentally responsible behavior: A prospective study of environmental goals. *Journal of Environmental Psychology* 23:349-357.

Oskamp S 2000. A sustainable future for humanity? How can psychology help? *American Psychologist* 55: 496–508.

Oskamp S, Hamngton MJ, Edwards TC, Shenvood DL, Okuda SM & Swanson DC 1991. Factors influencing household recycling behavior. *Environment and Behavior* 23: 494-519.

Östlund U, Kidd L, Wengström Y & Rowa-Dewar N 2011. Combining qualitative and quantitative research within mixed method research designs: A methodological review. *International Journal of Nursing Studies* 48: 369-383.

Ostman RE & Parker JL 1986. A public's environmental informational sources and evaluations of mass media. *Journal of Environmental Education* 18: 9-17.

Owens S 2000. 'Engaging the public': Information and deliberation in environmental policy. *Environment and Planning A* 32: 1141-1148.

Palmer JA 1998a. *Environmental education in the 21st century: Theory, practice, progress and promise.* New York: Rutledge.

Palmer JA 1998b. Spritual ideas, enviornmental concerns and educational practices. In DE Cooper & JA Palmer (eds) *Spirit of the environment: Religion, value and environmental concern,* 146-167. London: Routledge.

Paraskeva-Hadjichambi D, Korfiatis K, Hadjichambis AC & Arianoutsou M 2012. Conservation reasoning and proposed actions for the protection of threatened plant species: Insights from a sample of rural and urban children of Cyprus. *Society & Natural Resources: An International Journal* 25: 868-882.

Patterson ME & Williams DR 2005. Maintaining research traditions on place: Diversity of thought and scientific progress. *Journal of Environmental Psychology* 25: 361-380.

Pawson R & Tilley N 1997. *Realistic Evaluation*. London: SAGE.

Payne P 1998. Children's' conceptions of nature. *Australian Journal of Environmental Education* 14: 19–26.

Pe'er S, Goldman D & Yavetz B 2007. Environmental literacy in teacher training: Attitudes, knowledge, and environmental behavior of beginning students. *The Journal of Environmental Education* 39: 45-59.

Perry C, Alizadeh Y, Riege A 1997. *Qualitative methods in entrepreneurship research.* Proceedings of the annual conference of the small enterprise association of Australia and New Zealand held 21-23 September 1997. Coffs Harbour: Southern Cross University.

Pierce JC, Dalton RJ & Zaitsev A 1999. Public perceptions of environmental conditions. In Dalton RJ, Lovrich NP, Pierce JC, Whiteley JM (eds) *Critical masses: Citizens, nuclear weapons production, and environmental destruction in the United States and Russia*, 97-130. Cambridge, MA: MIT Press.

Pooley JA & O'Connor M 2000. Environmental education and attitudes: Emotions and beliefs are what is needed. *Environment and Behavior* 32: 711-723.

Poortinga W, Steg L & Vlek C 2004. Values, environmental concern, and environmental behavior. A study into household energy use. *Environment and Behavior* 36: 70-93.

Proshansky HM 1978. The city and self-identity. *Environment and Behavior* 10: 147-169.

Proshansky HM, Fabian AK & Kaminoff R 1983. Place-identity: Physical world socialization of the self. *Journal of Environmental Psychology* 3: 57-83.

Punch K 2005. *Introduction to social research: Quantitative and qualitative approaches.* 2nd ed. London: SAGE.

Pyle RM 2002. Eden in a vacant lot: Special places, species, and kids in the neighbourhood of life. In Kahn PH & Kellert SR (eds) *Children and nature: Psychological, sociocultural, and evolutionary investigations*, 307-327. Cambridge, MA: MIT Press.

Ramkissoon H, Weiler B & Smith LDG 2012. Place attachment and pro-environmental behaviour in national parks: The development of a conceptual framework. *Journal of Sustainable Tourism* 20: 257-276.

Ramsey CE & Rickson RE 1976. Environmental knowledge and attitudes. *The Journal of Environmental Education* 8: 10-18.

Rasmussen K 2004. Places for children–children's places. *Childhood* 11: 155-173.

Reddy C 2011. Environmental education and teacher development: Engaging a dual curriculum challege. (Inaugural Address). Stellenbosch: Stellenbosch University Language centre.

Relph E 1976. *Place and placelessness*. Volume 67. London: Pion.

Rennie LJ & Jarvis T 1995. Children's choice of drawings to communicate their ideas about technology. *Research in Science Education* 25: 239-252.

*Republikein* 2013. Gruwelooslik vuil [online]. Available from: http://www.republikein.com.na/menings/gruwelooslik-vuil.214710 [Accessed 25 January 2014].

Rickinson M 2001. Learners and learning in environmental education: A critical review of the evidence. *Environmental Education Research* 7: 207-320.

Rideout BE, Hushen K, McGinty D, Perkins S & Tate J 2005. Endorsement of the new ecological paradigm in systematic and e-mail samples of college students. *Journal of Environmental Education* 36: 15-23.

Riger S & Lavrakas PJ 1981. Community ties: Patterns of attachment and social interaction in urban neighborhoods. *American Journal of Community Psychology* 9: 55-66.

Rioux L 2011. Promoting pro-environmental behaviour: Collection of used batteries by secondary school pupils. *Environmental Education Research* 17: 353-373.

Ritchie J 2003. The applications of qualitative methods to social research. In Richie J & Lewis J (eds) *Qualitative research practice: A guide for social science students and researchers,* 24-46. London: SAGE.

Ritchie J, Lewis J & Elam G 2003. Designing and selecting samples. In Richie J & Lewis J (eds) *Qualitative research practice: A guide for social science students and researchers*, 111-146. London: SAGE.

Rogan R, O'Connor M & Horwitz P 2005. Nowhere to hide: Awareness and perceptions of environmental change, and their influence on relationships with place. *Journal of Environmental Psychology* 25: 147-158.

Rollero C & De Piccoli N 2010. Place attachment, identification and environment perception: An empirical study. *Journal of Environmental Psychology* 30: 198-205.

Sack RD 1997. *Homo geographicus: A framework for action, awareness, and moral concern.* Baltimore: Johns Hopkins University Press.

Sahin S, Demrialp N, Karabag S 2007. Sustainable development and geography curriculum of 2005 in Turkey: How geography student teachers conceptualizes sustainable

development. In Reinfried S, Schleicher Y, Rempfler A (eds) *Geographical Views on Education for Sustainable Development,* 128-132. Proceedings at the Lucerne-Symposium held 29-31 July 2007. Switzerland: International Geographical Union Commission on Geographical Education.

Sampson KA & Goodrich CG 2009. Making place: Identity construction and community formation through "sense of place" in Westland, New Zealand. *Society & Natural Resources: An International Journal* 22: 901-915.

Sanders S, Bowie SL & Bowie YD 2003. Lessons learned on forced relocations of older adults: The impact of hurricane Andrew on health, mental health, and social support of public housing residents. *Journal of Gerontological Social Work* 40: 23-35.

Santcross N, Baker G & Ballard S 2001. *Namibia handbook.* Bath, England: Footprint.

Saphores JDM, Nixon H, Ogunseitan OA & Shapiro AA 2006. Household willingness to recycle electronic waste an application to California. *Environment and Behavior* 38: 183-208.

Sasman C 2013. Okahandja, Rehoboth 'vuilste dorpe' [online]. Available from: http://www.republikein.com.na/regering-politiek/okahandja-rehoboth-vuilste-dorpe.209490 [Accessed 9 March 2014].

Satterwaitte D, Hart R, Levy C, Ross D & Smith J 1996. *The environment for children: Understanding and acting on the environmental hazards that threaten children and their parents.* London: Earthscan.

Saylan C & Blumstein DT 2007. *The failure of environmental education [and how we can fix it]*. Berkeley: University of California Press.

Scannell L & Gifford R 2010. Defining place attachment: A tripartite organizing framework. *Journal of Environmental Psychology* 30: 1-10.

Schahn J & Holzer E 1990. Studies of individual environmental concern: The role of knowledge, gender, and background variables. *Environment and Behavior* 22: 767-786.

Schlegelmilch BB, Bohlen GM & Diamantopoulos A 1996. The link between green purchasing decisions and measures of environmental consciousness. *European Journal of Marketing* 30: 35-55.

Schmidl-Waehner T 1942. Formal criteria for the analysis of children's drawings. *American Journal of Orthopsychiatry* 12: 95-103.

Schultz PW 2000. Empathizing with nature: the effects of perspective taking on concern for environmental issues. *Journal of Social Issues* 56: 391-406.

Schultz PW & Zelezny LC 1998. Values and proenvironmental behavior: A five-country survey. *Journal of Cross-cultural Psychology* 29: 540-558.

Schultz PW & Zelezny LC 1999. Values as predictors of environmental attitudes: Evidence for consistency across 14 countries. *Journal of Environmental Psychology 19*: 255-265.

Schultz PW & Zelezny LC 2003. Reframing environmental messages to be congruent with American values. *Human Ecology Review* 10: 126-136.

Schultz PW, Oskamp S & Mainieri T 1995. Who recycles and when? A review of personal and situational factors. *Journal of Environmental Psychology* 15: 105-121.

Schultz PW, Gouveia VV, Cameron LD, Tankha G, Schmuck P & Franěk M 2005. Values and their relationship to environmental concern and conservation behavior. *Journal of Cross-cultural Psychology* 36: 457-475.

Schutz PA, Chambless CB & DeCuir JT 2003. Multimethods research. In deMarrais K & Lapan SD (eds) *Foundations for research: Methods of inquiry in education and the social sciences*, 267-282. New York: Routledge.

Schwartz SH 1977. Normative influences on altruism. In Berkowitz L (ed) *Advances in experimental social psychology*, 221-279, Volume 10. New York: Academic Press.

Schwartz SH & Bilsky W 1990. Toward a theory of the universal content and structure of values: Extensions and cross-cultural replications. *Journal of Personality and Social Psychology* 58: 878-891.

Scott D & Willits FK 1994. Environmental attitudes and behavior a Pennsylvania survey. *Environment and Behavior* 26: 239-260.

Shackleton C & Shackleton S 2004. The importance of non-timber forest products in rural livelihood security and as safety nets: A review of evidence from South Africa. *South African Journal of Science* 100: 658-664.

Sharp J & Adua L 2009. The social basis of agro-environmental concern: Physical versus social proximity. *Rural Sociology* 74: 56-85.

Silverman D 2001. *Interpreting qualitative data: Methods for analyzing talk, text and interaction*. London: SAGE.

Simmons D & Widmar R 1990. Motivations and barriers to recycling: Toward a strategy for public education. *The Journal of Environmental Education* 22: 13-18.

Smit E 2012. Big plans for the Garden Town [online]. Available from: http://www.namibiansun.com/content/national-news/big-growth-plans-for-%C3%A2%E2%82%AC%CB%9Cgarden-town%C3%A2%E2%82%AC%E2%84%A2 [Accessed 7 June 2015].

Smit GM 1989. 'n Teoretiese fundering vir die kurrikulering van omgewingsleer vanuit 'n omgewingsperspektief. Master's thesis. Pretoria: University of South Africa, Faculty of Education.

Smith DM 1974. Who gets what where, and how: A welfare focus for human geography. *Geography* 59: 289-297.

Smith J 2011. Red alert on sanitation and safe drinking water [online]. Available from: http://www.namibian.com.na/indexx.php?archive_id=82426&page_type=archive_story_detail&page=1616 [Accessed 2 December 2014].

Smith MD & Krannich RS 2000. Culture clash" revisited: Newcomer and longer-term residents' attitudes toward land use, development, and environmental issues in rural communities in the Rocky Mountain West. *Rural Sociology* 65: 396-421.

Snaddon JL & Turner EC 2008. A child´s eye view of the insect world: perceptions of insect diversity. *Environmental Conversation* 34: 33–35.

Solem M, Kollasch A & Lee J 2013. Career goals, pathways and competencies of geography graduate students in the USA. *Journal of Geography in Higher Education* 37: 92-116.

Stapp WB 1969.The concept of environmental education. *Environmental Education* 1: 30-31.

Stapp WB 1974. Historical setting of environmental education. In Swan JA & Stapp WB (eds) *Environmental education: Strategies toward a more livable future*, 42-53. New York: SAGE.

Starik M & Rands GP 1995. Weaving an integrated web: Multilevel and multisystem perspectives of ecologically sustainable organizations. *Academy of Management Review* 20: 908-935.

STATISTICA 2015. *Electronic statistics textbook*. StatSoft Inc. [Online Help]. Online available: https://www.statsoft.com/Textbook.

Stedman RC 2002. Toward a social psychology of place predicting behavior from place-based cognitions, attitude, and identity. *Environment and Behavior* 34: 561-581.

Stedman RC 2003. Is it really just a social construction? The contribution of the physical environment to sense of place. *Society & Natural Resources: An International Journal* 16: 671-685.

Steg L, Bolderdijk JW, Keizer K & Perlaviciute G 2014. An integrated framework for encouraging pro-environmental behaviour: The role of values, situational factors and goals. *Journal of Environmental Psychology* 38: 104-115.

Steinberg L 2005. Cognitive and affective development in adolescence. *Trends in Cognitive Sciences* 9: 69-74.

Stern PC 1992. Psychological dimensions of global environmental change. *Annual Review of Psychology* 43: 269-302.

Stern PC 1993. A second environmental science: Human-environment interactions. *Science* 260: 1897-1899.

Stern PC 2000. Toward a coherent theory of environmentally significant behavior. *Journal of Social Issues* 56: 407-424.

Stern PC & Dietz T 1994. The value basis of environmental concern. *Journal of Social Issues* 50: 65-84.

Stern PC, Dietz T & Guagnano GA 1995. The new ecological paradigm in social-psychological context. *Environment and Behavior* 27: 723-743.

Stern PC, Dietz T & Kalof L 1993. Value orientations, gender, and environmental concern. *Environment and Behavior* 25: 322-348.

Stern PC, Dietz T, Kalof L & Guagnano GA 1995. Values, beliefs and pro-environmental action: Attitude formation toward emergent attitude objects. *Journal of Applied Social Psychology* 26: 1611-1636.

Stern PC, Young, O & Druckman D 1991. *Global environmental change: Understanding the human dimensions*. Washington: National Academy Press.

Stevenson RB 2007. Schooling and environmental education: contradictions in purpose and practice. *Environmental Education Research* 13: 139-153.

Stokowski PA 2002. Languages of place and discourses of power: Constructing new senses of place. *Journal of Leisure Research* 34: 368-382.

Strife S 2010. Reflecting on environmental education: where is our place in the green movement?. *The Journal of Environmental Education* 41: 179-191.

Strohbach B 2001. Vegetation degradation in Namibia. *Namibia Scientific Society Journal* 49: 127-157.

Swaney D 2002. *Namibia*. Victoria, Australia: Lonely Planet Publications.

Tam W, Fry J & Probets S 2014. *The disciplinary shaping of research data management practices*. iConference 2014 Proceedings, 721-728.

Taplin DH, Scheld S & Low SM 2002. Rapid ethnographic assessment in urban parks: A case study of Independence National Historical Park. *Human Organization* 61: 80-93.

Teddlie C & Tashakkori A 2009. *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioral sciences*. Thousand Oaks: SAGE.

*The Namibian* 2014. Okahandja is anything but garden town [online]. Available from: http://www.namibian.com.na/indexx.php?archive_id=124166&page_type=archive_story_detail&page=1 [Accessed 6 August 2015].

Thomas GV & Jolley RP 1998. Drawing conclusions: A re-examination of empirical and conceptual bases for psychological evaluation of children from their drawings. *British Journal of Clinical Psychology* 37: 127-139.

Thomas GV & AMJ Silk 1990. *An introduction to the psychology of children's drawings.* Hemel Hempstead: Harvester Wheatsheaf.

Thompson SCG & Barton MA 1994. Ecocentric and anthropocentric attitudes toward the environment. *Journal of Environmental Psychology* 14: 149-157.

Tikka PM, Kuitunen MT & Tynys SM 2000. Effects of educational background on students' attitudes, activity levels, and knowledge concerning the environment. *The Journal of Environmental Education* 31: 12-19.

Tilbury D 1993. Environmental education: Developing a model for initial teacher education. Doctoral dissertation. Cambridge: University of Cambridge.

Tilbury D 1995. Environmental education for sustainability: Defining the focus of environmental education in the 1990s. *Environmental Education Research* 1: 195-212.

Tindall DB, Davies S & Mauboulès C 2003. Activism and conservation behavior in an environmental movement: The contradictory effects of gender. *Society & Natural Resources: An International Journal* 16: 909-932.

Tjihenuna T & Haidula T 2014. Pohamba angry again [online]. Available from: http://www.namibian.com.na/indexx.php?archive_id=131317&page_type=archive_story_detail&page=1 [Accessed 17 January 2015].

Tobler N 1986. Meta-analysis of 143 adolescent prevention programs: Quantitative outcome results of program participants compared to a control or comparison group. *Journal of Drug Issues* 16: 537-567

Tömmel C 2009. Canon-Reisefotografie Herero ladys [online]. Available from: http://www.fotocommunity.de/pc/pc/display/17947111# [Accessed on 14 January 2015].

Trend R, Everett L & Dove J 2000. Interpreting primary children's representations of mountains and mountainous landscapes and environments. *Research in Science & Technological Education* 18: 85-112.

Trentelman CK 2009. Place attachment and community attachment: A primer grounded in the lived experience of a community sociologist. *Society & Natural Resources: An International Journal* 22: 191-210.

Trewhella WJ, Rodriguez-Clark KM, Corp N, Entwistel A, Garrett SRT, Granek E, Lengel KL, Raboude MJ, Reason PF and Sewall BJ 2005. Environmental education as a component of multidisciplinary conservation programs: Lessons from conservation initiatives for critically endangered fruit bats in the Western Indian Ocean. *Conservation Biology* 19: 75-85.

Tuan Y 1974. *Topophilia: A study of environmental perception, attitudes, and values*. Englewood Cliffs, NJ: Prentice-Hall.

Tuncer G, Ertepinar H, Tekkaya C & Sungur S 2005. Environmental attitudes of young people in Turkey: Effects of school type and gender. *Environmental Education Research* 11: 215-233.

Turaga RMR, Howarth RB & Borsuk ME 2010. Pro-environmental behavior. *Annals of the New York Academy of Sciences* 1185: 211-224.

Turner P & Turner S 2006. Place, sense of place, and presence. *Presence: Teleoperators and Virtual Environments* 15: 204-217.

Twigger-Ross CL & Uzzell DL 1996. Place and identity processes. *Journal of Environmental Psychology* 16: 205-220.

UNESCO (United Nations Educational, Scientific and Cultural Organization) 1975. *The International Workshop on Environmental Education*. Proceedings of the International Workshop on Environmental Education held 13-22 October 1975. Belgrade: UNESCO.

UNESCO (United Nations Educational, Scientific and Cultural Organization) 1978. *Intergovernmental Conference on Environmental Education.* Proceedings of the Intergovernmental Conference on Environmental Education conference held 14-26 October 1977. Tbilisi: UNESCO/UNEP.

Urban J & Ščasný M 2012. Exploring domestic energy-saving: The role of environmental concern and background variables. *Energy Policy* 47: 69-80.

Uyeki ES & Holland LJ 2000. Diffusion of pro-environment attitudes? *The American Behavioral Scientist* 43: 646-662.

Uzzell D, Pol E & Badenas D 2002. Place identification, social cohesion, and environmental sustainability. *Environment and Behavior* 34: 26-53.

Valentine G, McKendrick J 1997. Children's outdoor play: Exploring parental concerns about children's safety and the changing nature of childhood. *Geoforum* 28: 219-235.

Van Arsdol MD, Sabagh G & Alexander F 1964. Reality and the perception of environmental hazards. *Journal of Health and Human Behavior* 5: 144-153.

Vandemark LM 2007. Promoting the sense of self, place, and belonging in displaced persons: The example of homelessness. *Archives of Psychiatric Nursing* 21: 241-248.

Van Lange PA, Vugt MV, Meertens RM & Ruiter RA 1998. A social dilemma analysis of commuting preferences: The roles of social value orientation and trust. *Journal of Applied Social Psychology* 28: 796-820.

Van Liere KD & Dunlap RE 1980. The social bases of environmental concern: A Review of hypotheses, explanations and empirical evidence. *Public Opinion Quarterly* 44: 181-197.

Van Liere KD & Dunlap RE 1981. Environmental concern does it make a difference how it's Measured? *Environment and Behaviour* 13: 651-676.

Van Manen M 1990. *Researching Lived Experience. Human science for an actions sensitive pedagogy*. London: State University of New York Press.

Van Patten SR & Williams DR 2008. Problems in place: Using discursive social psychology to investigate the meanings of seasonal homes. *Leisure Sciences* 30: 448-464.

Van Petegem P & Blieck A 2006. The environmental worldview of children: A cross-cultural perspective. *Environmental Education Research* 12: 625-635.

Van Staden CJS & Loubser P 1995. A link between an ecological view of children and environmental education. *Educare* 24: 110-119.

Van Staden D, Rogers E, Makaudi I, Winkler J, White J, Kangale M, Rudman N, Nkosi S, Dreyer TR & Coetzer T 2006. A transect walk undertaken in Itereleng informal settlement to observe community vulnerability. Pretoria: City of Tshwane Metropolitan Municipality, Disaster Risk Management Centre.

Vaske JJ & Kobrin KC 2001. Place attachment and environmentally responsible behavior. *The Journal of Environmental Education* 32: 16-21.

Vaughan C, Gack J, Solorazano H & Ray R 2003. The effect of environmental education on schoolchildren, their Parents, and community members: A study of intergenerational and intercommunity learning. *The Journal of Environmental Education* 34: 12-21.

Vicente-Molina MA, Fernández-Sáinz A & Izagirre-Olaizola J 2013. Environmental knowledge and other variables affecting pro-environmental behaviour: Comparison of university students from emerging and advanced countries. *Journal of Cleaner Production* 61: 130-138.

Vining J & Ebreo A 1990. What makes a recycler? A comparison of recyclers and nonrecyclers. *Environment and Behavior* 22: 55-73.

Volk TL & McBeth B 1998. *Environmental literacy in the United States: What should be. . . what is. . .getting from here to there.* Washington, DC: North American Association for Environmental Education.

Vreken NJ & Rens JA 1997. *An introduction to environmental education*. Potchefstroom: Keurkopie.

Vygotsky LS 1971. *The psychology of art*. Cambridge, MA: MIT Press.

Waggoner PE & Ausubel JH 2002. A framework for sustainable science: A renovated IPAT identity. *Proceedings of the National Academy of Sciences of the United States of America* 99: 7860-7865.

Walker GJ & Chapman R 2003. Thinking like a park: The effects of sense of place, perspective-taking, and empathy on pro-environmental intentions. *Journal of Park and Recreation Administration* 21: 71-86.

Walker K, Myers-Bowman KS & Myers-Walls JA 2003. Understanding war, visualizing peace: Children draw what they know. *Art Therapy* 20: 191-200.

Walmsley DJ & Lewis GJ 2014. *People and environment: Behavioural approaches in human geography*. New York: Routledge.

Wals A 1994. Nobody planted it, it just grew!: Young adolescents' perceptions and experiences of nature in the context of urban environmental education. *Children's Environments* 11, 3: 1-27.

Wandersee JH & Schussler EE 1999. Preventing plant blindness. *The American Biology Teacher* 61: 82,84 & 86.

WEF (World Economic Forum) 2015. *The travel & tourism competitiveness report 2015*. Geneva: World Economic Forum.

Weigel RH & Newman LS 1976. Increasing attitude-behavior correspondence by broadening the scope of the behavioral measure. *Journal of Personality and Social Psychology* 33: 793-802.

Wells NM & Lekies KS 2006. Nature and the life course: Pathways from childhood nature experiences to adult environmentalism. *Children, Youth and Environments* 16, 1: 1-24.

Wesselink R & Wals AE 2011. Developing competence profiles for educators in environmental education organisations in the Netherlands. *Environmental Education Research* 17: 69-90.

Wheeler K 1975. The genesis of environmental education. In Martin GC & Wheeler K (eds) *Insights into environmental education*, 2-20. London: Oliver and Boyd.

White DD, Virden RJ & Van Riper CJ 2008. Effects of place identity, place dependence, and experience-use history on perceptions of recreation impacts in a natural setting. *Environmental Management* 42: 647-657.

White RT & Gunstone RF 1992. *Probing understanding*. London: Falmer Press.

Whitmarsh L & O'Neill S 2010. Green identity, green living? The role of pro-environmental self-identity in determining consistency across diverse pro-environmental behaviours. *Journal of Environmental Psychology* 30: 305-314.

Whittaker M, Segura GM & Bowler S 2005. Racial/ethnic group attitudes toward environmental protection in California: Is "environmentalism" still a white phenomenon?. *Political Research Quarterly* 58: 435-447.

Willats J 1977. How children learn to draw realistic pictures. *The Quarterly Journal of Experimental Psychology* 29: 367-382.

Williams DR & Roggenbuck JW 1989. *Measuring place attachment: Some preliminary results.* Paper deliver at the NRPA Symposium on Leisure Research held 20-22 October 1989. San Antonio, Texas: NRPA.

Williams DR & Vaske JJ 2003. The measurement of place attachment: Validity and generalizability of a psychometric approach. *Forest Science* 49: 830-840.

Williams DR, Patterson ME, Roggenbuck JW & Watson AE 1992. Beyond the commodity metaphor: Examining emotional and symbolic attachment to place. *Leisure Science* 14: 29-46.

Williams DR, Anderson BS, McDonald CD & Patterson ME 1995. *Measuring place attachment: More preliminary results.* Paper delivered at the NRPA Leisure Research Symposium held 4-8 October 1995. San Antonio, Texas: NRPA.

Winter C & Lockwood M 2004. The natural area value scale: A new instrument for measuring natural area values. *Australasian Journal of Environmental Management* 11: 11-20.

Wolf D & Perry MD 1988. From endpoints to repertoires: Some new conclusions about drawing development. *Journal of Aesthetic Education* 22: 17-34.

Worboys G, Lockwood M & De Lacy T 2001. *Protected area management: Principles and practice*. South Melbourne: Oxford University Press.

Worsley A & Skrzypiec G 1998. Environmental attitudes of senior secondary school students in South Australia. *Global Environmental Change* 8: 209-225.

Wray-Lake L, Flanagan CA & Osggod DW 2010. Examining trends in adolescent environmental attitudes, beliefs, and behaviors across three decades. *Environment and Behavior* 42: 61-85.

Wu L 2012. Exploring the new ecological paradigm scale for gauging children's environmental attitudes in China. *The Journal of Environmental Education* 43: 107-120.

Wu LY 2009. Children's graphical representations and emergent writing: Evidence from children's drawings. *Early Child Development and Care* 179: 69-79.

Xiao C & Hong D 2010. Gender differences in environmental behaviors in China. *Population and Environment* 32: 88-104.

Xiao C & McCright AM 2014. A test of the biographical availability argument for gender differences in environmental behaviors. *Environment and Behavior* 46: 241-263.

Yamashita S 2002. Perception and evaluation of water in landscape: Use of photo-projective method to compare child and adult residents perceptions of a Japanese river environment. *Landscape and Urban Planning* 62: 3-17.

Yli-Panula E & Eloranta V 2011. The landscapes that Finnish children and adolescents want to conserve – a study of pupils' drawings in Basic Education. *Nordidactica* 2: 35-63.

Young L & Barrett H 2001. Adapting visual methods: Action research with Kampala street children. *Area* 33: 141-152

Zelezny LC, Chua PP & Aldrich C 2000. New ways of thinking about environmentalism: Elaborating on gender differences in environmentalism. *Journal of Social Issues* 56: 443-457.

Zsóka ÁN 2008. Consistency and "awareness gaps" in the environmental behaviour of Hungarian companies. *Journal of Cleaner Production* 16: 322-329.

Zsóka Á, Szerényi ZM, Széchy A & Kocsis T 2013. Greening due to environmental education? Environmental knowledge, attitudes, consumer behavior and everyday pro-environmental activities of Hungarian high school and university students. *Journal of Cleaner Production* 48: 126-138.

# APPENDICES

**APPENDIX A: QUESTIONNAIRE SURVEY**



## SECTION A: ENVIRONMENTAL KNOWLEDGE AND AWARENESS

**A1) When burned, fossil fuels (e.g. gas and oil) produced $CO_2$ (carbon dioxide) in the atmosphere.**

| True | False | Unsure |
|------|-------|--------|

**A2) All living beings (micro-organisms, plants, animals and humans) rely on each other.**

| True | False | Unsure |
|------|-------|--------|

**A3) There is a lack of clean drinking water in certain parts of Namibia.**

| True | False | Unsure |
|------|-------|--------|

**A4) The chopping down of trees increases soil erosion.**

| True | False | Unsure |
|------|-------|--------|

**A5) Is it important for Okahandja to be a clean town?**

| Yes | No |
|-----|-----|

**Explain your answer.**

_____

_____

**A6) Who informs you most about the conservation of the natural environment? (Select one)**

| Teachers | Parents/family | Friends | Government | Other (specify)............................................. |
|----------|----------------|---------|------------|------------------------------------------------------------|

## SECTION B: PLACE ATTACHMENT

**B1) Okahandja is the best place in which to live.**

| Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|-------------------|----------|---------|-------|----------------|

**B2) Okahandja is a very special place to me.**

| Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|---|---|---|---|

**B3) I miss Okahandja when I am away from it for too long.**

| Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|---|---|---|---|

**B4) I feel very connected to Okahandja.**

| Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|---|---|---|---|

**B5) I feel part of the community in which I live.**

| Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|---|---|---|---|

**B6) If given a choice to live anywhere, I would choose to live in Okahandja.**

| Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|---|---|---|---|

**B7) What about Okahandja makes you proud?**

_____

_____

**B8) What about Okahandja makes you ashamed?**

_____

_____

## SECTION C: ENVIRONMENTAL CONCERN

General environmental concern

**C1) We have to care for the natural environment if we want to survive.**

| Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|---|---|---|---|

**C2) We must protect our country's natural resources for future generations.**

| Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|---|---|---|---|

**C3) Because any pollution that we cause affects the health of the natural environment, this is important to me.**

| Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|---|---|---|---|

**C4) All schoolchildren in Namibia should support the conservation of the natural environment.**

| Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|---|---|---|---|
| | | | | |

**C5) Because environmental problems can be easily solved, there is no need for me to worry about the future.**

| Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|---|---|---|---|
| | | | | |

**C6) It is important to protect as wide a variety of animals and plants as we possibly can.**

| Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|---|---|---|---|
| | | | | |

Environmental worldview

**C7) We have the right to change the natural environmental to suit our needs.**

| Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|---|---|---|---|
| | | | | |

**C8) The earth is like a spaceship with very limited room and resources (food, water and air).**

| Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|---|---|---|---|
| | | | | |

**C9) We are as part of the natural environment as are animals.**

| Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|---|---|---|---|
| | | | | |

**C10) We are meant to rule over the natural environment.**

| Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|---|---|---|---|
| | | | | |

**C11) We need the natural environment to survive.**

| Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|---|---|---|---|
| | | | | |

## SECTION D: ENVIRONMENTAL BEHAVIOUR

**D1) After eating a packet of chips and there is no rubbish bin in sight, what do you do with the packet?**

| Throw it on the ground. | Keep it until I find a rubbish bin. |
|---|---|
| | |

**D2) You see a tap left running in the school bathroom, what do you do?**

| Leave it as it is no concern to me. | I do not think about it. | Close it immediately. |
|---|---|---|

**D3) Do you and your family do anything to save energy?**

| Yes | No |
|---|---|

**If yes, what do you do?**

_____

**D4) I am willing to take a cloth shopping bag to Shoprite rather than taking a free plastic bag because this prevents pollution of the environment.**

| Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|---|---|---|---|

**D5) I am willing to participate in environmental clean-ups in and around Okahandja.**

| Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|---|---|---|---|

**D6) Is it acceptable to throw a plastic bag in the street?**

| Yes | No |
|---|---|

**Explain your answer.**

_____

_____

**D7) Does littering contribute to job creation in Okahandja?**

| Yes | No |
|---|---|

**If yes, who told you so and how does it contribute?**

_____

_____

## SECTION E: BIOGRAPHIC INFORMATION

**E1) What is your gender?**

| Male | Female |
|---|---|

**E2) In what grade are you in school?**

| Grade 8 | Grade 9 | Grade 10 | Grade 11 |
|---------|---------|----------|----------|

**E3) Which of the following do you take as a school subject(s)?**

| Geography | Life Science | Biology | Agriculture | None of these |
|-----------|--------------|---------|-------------|---------------|

**E4) What ethnic group do you consider yourself to be?**

| Herero | Ovambo | Damara | Coloured | Nama | Other (specify):………………………………... |
|--------|--------|--------|----------|------|-------------------------------------------|

**E5) Where do you live in Okahandja?**

| Central Okahandja | Nau-Aib | Vyf Rand Camp | Veddersdal | Smarties | Other (specify):………………………… |
|-------------------|---------|---------------|------------|----------|----------------------------------|

**E6) Is there a working television set in your home?**

| Yes | No |
|-----|-----|

**E7) Do you have access to the daily newspaper(s)?**

| Yes | No |
|-----|-----|

**E8) Does your family own a motor vehicle(s)?**

| Yes | No |
|-----|-----|

**E9) Which of the following tourist destinations have you visited?**

| Von Bach Dam Resort | |
|---------------------|---|
| Daan Viljoen Game Reserve | |
| Gross Barmen Hot Springs | |

**E10) What is the farthest place you have ever travelled to from Okahandja?**

_____

**E11) How does your family travel to places away from Okahandja?**

| Own car/bakkie | Hitchhike | Taxi | Train | Other (specify):……………………………………… |
|----------------|-----------|------|-------|-------------------------------------------|

**E12) Do you have any family or relatives who farm and/or live on communal lands?**

| Yes | No |
|-----|-----|

**E13) Does your family collect firewood to meet your daily fuel needs?**

| Yes | No |
|-----|-----|

**E14) Does your family harvest natural food products (e.g. wild animals, omajovas, mopani worms, marulas?**

| Yes | No |
|-----|-----|

**E15) Does your family have a vegetable garden?**

| Yes | No |
|-----|-----|

**E16) Does your family own livestock?**

| Yes | No |
|-----|-----|

Thank you for taking the time to complete the questionnaire.

Please hand the questionnaire back to the researcher when you are done.

## APPENDIX B: COVERING LETTER

UNIVERSITEIT·STELLENBOSCH·UNIVERSITY
jou kennisvennoot · your knowledge partner

*Geografie en Omgewingstudie*
*Geography and Environmental Studies*

25 April 2014

The Head Master
JG van der Wath Secondary School

Dear Sir/Madam

**Ms Tiani Moolman (Student number 15772349)** is a student in the Department Geography and Environmental Studies at the University of Stellenbosch.  She is registered for the Masters Programme in Geography and Environmental Studies.  She is currently working on a research project titled:

*The environmental reasoning of adolescents: A case study of Okahandja, Namibia*

Her research project is grounded in different methodological approaches that will be used to investigate the environmental reasoning of high school children in Okahandja. She plans to distribute approximately 400 questionnaires (to be completed by learners in Grade 9 to Grade 11). This will shed some light on the learners' environmental knowledge, awareness and to provide some biographical background of participants. Secondly, approximately 80 learners (2 classes) will be asked to draw pictures of how their perceive Okahandja and their local environment (ecologically and socially). Lastly, she will conduct focus groups discussions with three dominant cultural groups, where environmental problems and possible solutions will be discussed.

If you need more information about her research, please don't hesitate to contact me.

Yours faithfully

Prof SLA Ferreira

Prof SLA Ferreira
*Departmental Chair*
Tel no +27 21 808 3105
mail slaf@sun.ac.za

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Tel +27 21 8083218;  Faks/Fax +27 21 8083109;  E-pos/mail geom@sun.ac.za

**APPENDIX C: LETTER OF PERMISSION**

## J G van der Wath Secondary School

P.O. BOX 40, OKAHANDJA
TEL: 062-501491/FAX: 062-503463

To whom it may concern

Hereby I, Mr R Williams, Principal of JG van der Wath Secondary School in Okahandja, grant permission to Tiani Moolman, a student from Stellenbosch University, to do research for her Master's Degree in Geography and Environmental Studies at the school during the first week of the second term (13 – 16 May 2014).

Mr R Williams
PRINCIPAL

Date:    16 April 2014

MINISTRY OF EDUCATION
AND CULTURE
J. G. VAN DER WATH
SECONDARY SCHOOL
16 APR 2014
P. O. BOX 40 - OKAHANDJA
OTJOZONDJUPA REGION
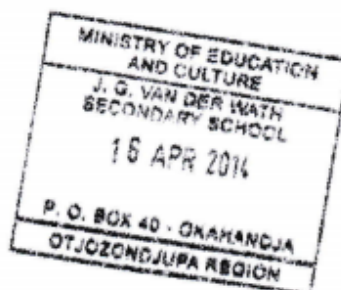
## APPENDIX D: EXAMPLES OF PARTICIPATORY DRAWINGS

Drawing 1: Present-state drawings

Drawing 2: Future-state drawings