

The impact of HIV/AIDS on rural children's reliance on natural resources  
within the Eastern Cape, South Africa

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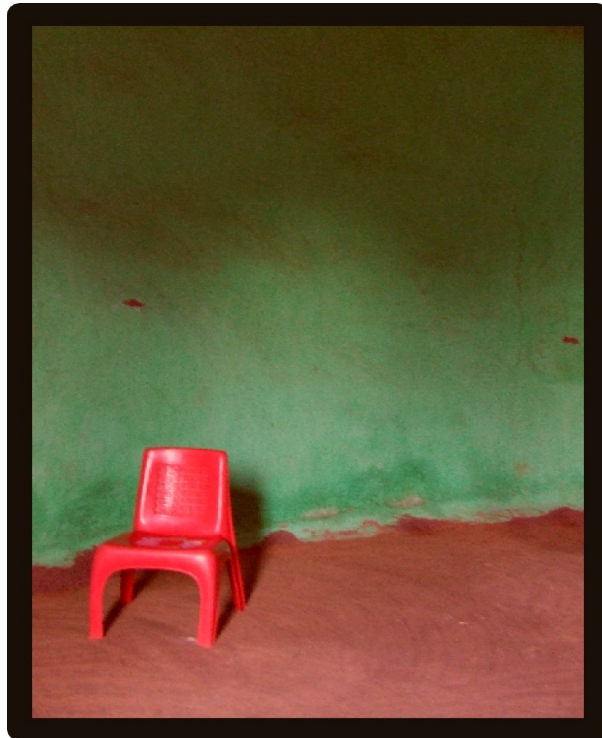
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## *Abstract*

The role of natural resources in the lives of rural children impacted by HIV/AIDS remains unexplored. This study highlights wild food use by rural children vulnerable to the impacts of HIV/AIDS as an important and regular activity that supplements their domestic diets. This work found that with an increase in vulnerability to HIV/AIDS, children rely more on wild foods. Through an 18 month project in the Eastern Cape, using a broad quantitative and qualitative school and non-school survey, individual interviews, food diaries, participant observation, interactive photography, and other participatory techniques, a total of 850 children's coping strategies and livelihoods were examined. The quality of children's domestic diets was, on average, 60 % lower than the Food and Agricultural Organization (FAO) guidelines. However, 62 % of the children interviewed were supplementing their diets with wild foods, 30 % having over half their diet supplemented with wild foods. Dietary diversity showed a 13 % increase when wild food supplementation occurred. While traditionally rural children rely on reciprocal networks during times of crisis, we found that these networks were eroding from the pressures of HIV/AIDS. Begging, for some children, was replaced by wild food collection and a significantly larger proportion of children more vulnerable to HIV/AIDS relied on wild foods more than did less vulnerable children. Considering the heightened nutritional and energy needs of children, combined with the impact of HIV/AIDS on household food access, wild foods represent the last freely attainable food sources available to them. Hunting and collection of wild food is a group activity, which was found to have valuable psycho-social benefits. Commercialisation of wild foods was observed among 38 % of the children, with significantly more vulnerable children selling wild foods. The use of wild foods by rural children also had positive influences on the preservation of indigenous ecological knowledge.

*Key words:* HIV/AIDS, rural food security, safety-nets, vulnerable rural children, wild food.



*“You must not tell us about poverty,  
it takes away our strength,  
let us tell you”*

Bongiwe, 17 year old girl, Coffee Bay

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## *Abbreviations*

AIDS – Acquired Immunodeficiency Syndrome
CBNRM – Community Based Natural Resource Management
FAO – Food and Agricultural Organization
HIV – Human Immunodeficiency Virus
HV - Children living in households that are highly vulnerable to the impacts of HIV/AIDS
IDDI – Individual Dietary Diversity Index
IDDS – Individual Dietary Diversity Score
IUCN – The World Conservation Union
KSD- King Sabata Dalindeybo Districted Municipality
LV - Children living in households that are least vulnerable to the impacts of HIV/AIDS
MLRM - Marine Living Resource Management Act, South
NRM – Natural Resource Management
UNICEF - United Nations Children's Fund
WESSA – Wildlife and Environment Society of South Africa
WHO - World Health Organization



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## ***Chapter one:***

### ***Introduction***

*“We did not eat anything that morning. I told my mother I will go to the forest to pick wild fruit. Everyone was happy with my plan. I collected fruit, and I brought it back to the house. Everyone was happy with the fruit. I always use this plan when we are hungry.”*

Nosicelo 16 year old girl, Mabehana

#### ***1.1. Overview***

In this chapter the impact of HIV/AIDS on rural communities is introduced, with particular emphasis on children made vulnerable to HIV/AIDS. The impact HIV/AIDS has on reducing rural people's food security and thus their nutritional intake is illustrated, as well as the use of wild foods by rural people as a major coping strategy to survive the food scarcities induced by HIV/AIDS. Drawing from contemporary literature, evidence is provided for the particular vulnerability rural children experience from the impact of HIV/AIDS; what makes them even more vulnerable is the weakening of reciprocal support structures usually relied upon during times of crisis due to HIV/AIDS, thus promoting rural children to fall back on the traditional use of natural resources as a substitute safety net. Very little is known about children's independent use of natural resources; but I summarize what is known and consider what could be causing this lack in knowledge around these processes. Key questions are posed to investigate the cryptic world of rural children's use of wild foods. Finally a layout of the thesis is provided.

#### ***1.2. Vulnerable rural children in South Africa***

Within the context of heightened urbanization and HIV/AIDS in sub-Saharan Africa, rural children are highlighted as a key vulnerable group for food and nutritional insecurity (Drew *et al.*, 1998; Foster, 2004). In the hard-hit southern African region, currently 13 % of all children are orphans (those who have lost either both their parents or their mother), and more than half of these children are orphaned from HIV/AIDS (UNICEF *et al.*, 2002; de Waal and Whiteside, 2003). With the increase in urbanization, more and more children are left in rural areas to be looked after by other family members (usually grandparents and siblings) while their parents seek work in local towns and cities

(Van der Waal, 1996; Madhavan, 2004; Foster, 2005). This phenomenon is particularly common in the former Bantu homelands in South Africa, like the Transkei and Ciskei, where there is an entrenched history of migrant labor (Bundy, 1979; Ministry in the office of the president, 1996; Smit, 1998; Bank, 2002). Many children are left with family members who are often already supporting more children than they can cope with. This places significant burdens on the guardian to feed, clothe and school these children (Bundy, 1979; Ministry in the office of the president, 1996; Smit 1998; Bank, 2002).

### ***1.3. HIV/AIDS and Nutrition***

In most parts of rural South Africa diets are based on staple grains and are therefore high in carbohydrates and low in essential vitamins and complete animal-derived proteins (Steyn *et al.*, 1993; van der Waal, 2004). Consequently, ensuring rural people meet the suggested nutritional requirements set by the FAO and WHO is difficult (Enwonwu and Warren, 2001; Haddad and Gillespie, 2001; FAO/WHO, 2002; Gillespie *et al.*, 2004). Rural communities are often unable to afford the cost of supplementing their diets with purchased food from nearby towns due to the long distances travelled to get there and the high levels of poverty, which is caused by several drivers. Added to this food in rural areas is more expensive than urban areas (NAMC, 2007). Even if a rural person was able to access enough food, in the presence of HIV/AIDS their nutritional needs are increased. HIV/AIDS places heavy demands on the micro and macro nutritional requirements of infected individuals. Good micronutrient nutrition decreases the risk of primary infection and prevents secondary infection (Friss, 1998; Vorster *et al.*, 2004). Afflicted individuals also have an increase in protein requirements of up to 50 %, as well as a 15 % increase in energy requirements (Friss, 1998; Piwoz and Preble, 2002). Yet despite this dire picture, rural livelihoods are resilient, and diversification is often evident as a strategy for decreasing risk and coping with hardship (Bryceson, 2002; Campbell *et al.*, 2002). From the assessment of the literature and the research presented in the subsequent chapters there is increasing evidence to suggest that relying on wild foods might be an example of rural diversification to mitigate these higher nutritional demands.

### ***1.4. Wild foods as natural safety nets***

Surrounding ecosystems provide a variety of natural products for local people, including fuel wood, medicines, timber, and importantly, a nutritious source of food (Barany, 2003, Frison *et al.*, 2005; Shackleton and Shackleton, 2004<sup>a</sup>; 2006; Paumgarten, 2005; 2006). A diverse body of literature has highlighted the wide utility of wild foods from natural areas, including fruits, herbs, honey, mushrooms, fish, birds, small mammals, reptiles and insects (High and Shackleton 2000; FAO, 2002;

Manika and Trivedi, 2002; de Merode *et al.*, 2004; Lowassa *et al.*, 2004; Swallow *et al.*, 2004; Takasaki *et al.*, 2004; Barany *et al.*, 2005).

Within this developing discourse, the utility of wild plant foods has attracted the attention of human ecologists, health practitioners and nutritionists. Wild fruits and nuts provide valuable inputs of protein, vitamins and micronutrients, and leafy vegetables are key sources of micronutrients including vitamins A, C, and iron (Semba and Tang, 1999; Schippers, 2000; Beisel, 2002; Kinyuy, 2001; Piwoz and Preble, 2002). For example, a portion of *Amaranthus spp*, commonly utilised throughout Africa as a green leafy vegetable, typically has 200 times as much vitamin A as the same size portion of cabbage and more than 10 times the amount of iron. In sum, *Amaranthus spp* provide about 4 500 units of vitamins per 100 g edible portion, compared to the 600 g of Swiss chard and 280 g of cabbage needed to compile the same units of vitamins (Schippers, 2000). Wild leafy vegetables are also typically rich in carotenoids. For example, *Amaranthus spp*, *Chenopodium album* and *Bidens pilosa* have at least 200 times more carotenoids than cabbage (Kruger *et al.*, 2005). Carotenoids along with vitamin A have been shown to play a vital role in both reducing infection risk as well as slowing the progression of HIV into AIDS (Mehendale *et al.*, 2001; Melikian *et al.*, 2001; Beisel, 2002).

Within rural environments, there is a complex relationship between food security, culture, poverty and the environment. In many rural areas, even those families who can afford to purchase commercially available food may also rely on wild foods due to cultural preferences (Njiforti, 1996; Fa *et al.*, 2002; Jerozolinski and Peres, 2003; East *et al.*, 2005); or choose to draw on wild foods due to ease of access relative to purchased foods. Wild foods are commonly utilised during times of heightened poverty or following shock events, such as the retrenchment of a major bread winner, death in the family, loss of livestock or failure of a crop (Angelsen and Wunder, 2003; Paumgarten, 2005). In this latter context, wild foods are understood as performing a critical “safety net” function to rural people (Byron and Arnold, 1999; Pattanayak and Sills, 2001, Shackleton *et al.*, 2002; Senaratne *et al.*, 2003; Paumgarten, 2005; 2006). Wild food is often a freely accessed resource, which is a form of natural capital that can be easily mobilised and requires few capital inputs for their cultivation, and minimal landscape transformation for their harvesting. Economically, free access resources are often the domain of the poor and marginalized, such as women and children who often have specialist indigenous knowledge regarding the collection and processing of these resources (Pereira *et al.*, 2006). In terms of food security, free access resources require relatively minor investments but generate potentially large pay-offs (Reddy and Chakravarty, 1999; Cavendish, 2000). These include

beneficial financial capital gains from trade in wild natural resources and non-timber forest products, or merely cash-equivalent capital gains in the form of ecosystem goods and services (Fisher, 2004), which enhances the ability of an individual or household to purchase or trade for food (Neuman and Hirsch, 2000). More direct and immediate inputs into food and nutritional security are evident from the contribution of subsistence foods, including wild fruits, spinaches, nuts, seeds, grains, pulses and meats, to poor rural people's nutrition and ultimately their food security (Barany *et al.*, 2001; Barany, 2003; Gari, 2003; 2004). Given the importance of free access resources to the food security of vulnerable groups in rural African contexts, discussion is increasing around the hypothesised impact of HIV/AIDS on the use of these resources to attain food security (Barany, 2003; Torell *et al.*, 2006).

There is emerging evidence that wild foods are supplementing vulnerable peoples' diets, particularly the highly vulnerable groups of women and children, as well as providing a valuable nutritional input to those with weakened immune systems (Mehendale *et al.*, 2001; Melikian *et al.*, 2001; Beisel, 2002; Jansen van Rensburg *et al.*, 2004) and heightened malnutrition from HIV/AIDS infection (Friss, 1998; Piwoz and Preble, 2002; Voster *et al.*, 2004). However, the nutritional inputs from wild foods depend on whether these resources remain freely accessible and sustainably managed for those who need them the most.

### ***1.5. Children's use of wild foods***

While there is a wide body of literature supporting the fact that wild plants have valuable nutritional benefits for vulnerable rural people, there is a great deal of unmarked territory within the research regarding wild food and rural food security. While the gathering of wild plant foods (High and Shackleton, 2000; Save the Children UK and Oxfam, 2002; Du Guerny and Hsu, 2004; FAO, 2004; Hunter and Twine, 2005), and large mammal hunting by rural people (Dwasi, 2002; Rao and McGowen, 2002; Quinlan, 2004) is widely recognised; our knowledge regarding the links between collection and consumption of wild *animal sourced protein* and food security is particularly underdeveloped (Bennett, 2002). Similarly, the literature around the role rural children play in the use of wild foods (both animal and plant sourced) and the impact HIV/AIDS is having on rural children's reliance on wild foods is relatively unknown.

Although the literature documents very little of rural children's use of wild foods, some studies have identified what may be traditionally regarded as *children's foods* within the African context. In a study by Addis *et al.* (2006) in Ethiopia, children in three districts were described as perennial users,

consuming wild plants during seasons of food availability (sufficient crop stock), when adult consumption tended to decline. In South and southern Africa, the fruits of *Sclerocarya birrea* are widely consumed by children (Cavendish, 2000), and commonly traded for pocket money, or exchanged for other foods (Shackleton *et al.*, 2002), as are the fruits of the Rhum palm (*Borassus flabellifer*) and the velvet tamarind (*Dialium guineense*) in West Africa (Madge, 1994). In Malawi, although all generations engage in collection of wild fruits, it is primarily children who not only gather the bulk of produce (Chirwa *et al.*, 2006), but also consume the most wild foods as snack items (Ferguson *et al.*, 1993). In Zambia, collection of and trade in the roots of the shrub *Rhynchosia insignis*, an essential input into maize beer, is dominated by women, and children are most commonly engaged in collection activities (Sorensen, 1993). Typically regarded as 'children's foods' wild foods in essence contain far reaching nutritional and food security benefits for rural people as a whole. Indeed, the recognition of wild foods as children's foods is an important consideration when planning for food and nutritional security in contexts of heightened poverty or vulnerability due to HIV/AIDS (Barany *et al.*, 2005). Studies have suggested that animal foods are associated with improved nutritional status in HIV-infected persons, even for those in the earliest, asymptomatic stages of infection (Vorster *et al.*, 2004). Besides being used as an indicator of overall dietary quality, following a diet rich in animal foods has indicated smaller decreases in serum albumin, haemoglobin and lipid variables and smaller increases in liver enzymes than those who consumed a diet based merely on staple foods (Vorster *et al.*, 2004).

### ***1.6. Supplementation of protein poor diets with wild meat***

In developing countries, especially those subject to communal land tenure, wild animals are valuable, freely available protein sources, and subsistence hunting is increasingly recognized as an important activity within communities (Grivetti, 1975; Bennett and Robinson, 2000; Bhat and Rubuluza, 2000; Loibooki *et al.*, 2002; Jerozolinski and Peres, 2003; de Merode *et al.*, 2004; Fa *et al.*, 2005). Existing studies detailing subsistence hunting activities are relatively superficial, but do show the importance of both formal and opportunistic hunting of large mammals (e.g. primates, antelope) among rural people. The range of dependence varies widely between different countries of study, for example it is high in tropical west and central African countries, where tropical forests offer a range of Non-Timber Forest Products. An estimated 20 % of the animal protein in Nigeria is derived from wild food sources. In Ghana and Zaire, a review by Panayotou and Ashton (1992) found that wild meats were relied upon as the primary animal protein source by about 75 % of the population. In the Democratic Republic of Congo, de Merode *et al.* (2004) found that household wild meat consumption occurred on

average 5.8 times a month, within a range of 1-11 times per month. In Botswana Panayotou and Ashton (1992) found that game meat makes up 60 % of annual meat consumption, and that over 50 species of wild animal are harvested. Available literature regarding the opportunistic collection and hunting of small animals and insects by rural people is scant; however I provide a diverse variety of case studies that support my claims. For example, where protein intake is low and mammals and birds are scarce, insect collection is common (De Foliart, 1999).

In an extensive literature review, De Foliart (1999) described entomophagy (the eating of insects) as a common strategy adopted by rural people to add to their dietary diversity. In central Africa insects have accounted for 10 % of the animal proteins consumed annually (De Foliart, 1999) and insects have been widely consumed among rural people in the Democratic Republic of Congo, Angola, Congo Republic, Malawi, Zambia, and South Africa (De Foliart, 1999). The caterpillar *Imbrasia belina*, commonly known as the mopane worm, is collected, consumed and even marketed in South Africa, Botswana and Zimbabwe (Greyling and Potgieter, 2004). This caterpillar is a valuable source of protein and 100 grams of dried mopane contains 76 % of an average human adult's daily requirement (Greyling and Potgieter, 2004) and 100 % of the daily requirements of many vital minerals and vitamins (Bartlett, 1996). Over and above this, the commercial trade of the caterpillar was worth £ 4.2 million per year in 1995 (Greyling and Potgieter, 2004). Even less commercially popular insects are also harvested and eaten by rural people. Van der Waal (2004) identified the collection and consumption of 42 different species of grasshopper, for food, by the Tshvenda people in Limpopo province, South Africa. Children were the primary harvesters as well as old women. Some children would walk up to 6 km to reach productive grasshopper territory. The children were also observed creating innovative tools to catch grasshoppers. In Limpopo province, insects are particularly useful to children, being regarded as children's foods and being subject to higher utility in the context of heightened HIV/AIDS food insecurity (Hunter and Twine, 2005). Insects, unlike large sources of animal protein, are more accessible to small children, both culturally (i.e. considered acceptable food sources for children) and practically (i.e. requiring lower inputs in terms of hunting skill and hunting materials) and this could be the reason why they have become children's foods. Despite their accessibility and high nutritional content insects are often overlooked by nutritional scientists and conservationists alike. One of the main issues flagged by De Foliart (1999) is the rising pressure of western attitude towards insect consumption. De Foliart (1999) highlights several studies that mention the effect western aversions to entomophagy have had on inhibiting insect consumption among rural people in Africa, without providing any substitutes to the loss of nutrition the insects previously



provided.

While we know that children harvest insects for food, there is evidence to suggest that the hunting and consumption of small mammals and birds by rural children also exists. White (2004) conducted a study in the Eastern Cape province of South Africa looking at the interactions between forest fauna and rural people. The study revealed both opportunistic and intentional hunting among men and boys. Subsistence hunting among boys occurred on a weekly basis and a monthly basis for men. It was found that they hunted any species they came across, including: common duiker (*Sylvicapra grimmia*) and blue duiker (*Cephalophus menticola*), bushbuck (*Tragelaphus scriptus*), scrub hare (*Lepus saxatilis*), bushpig (*Potamochoerus pocus*), vervet monkeys (*Ceropithecus aethiops*), large grey mongoose (*Gallerella pulveralenta*), water mongoose (*Ichneumia albicaude*) and the large spotted genet (*Genetta tigrina*). In the Eastern Cape, Shackleton *et al.* (2001) also reported opportunistic hunting of small game for meat, which included species of small ungulates, primates, pigs and birds similar to those found by White (2004).

### ***1.7. Methodological and research gaps***

Considering the current literature there is a definite need to address contemporary research regarding wild food, particularly wild meat, consumption by rural African children within the context of HIV/AIDS. This shift in research priorities with regards to AIDS-affected rural and wild food use is considered essential due to methodological and research interest gaps in both the ecological and nutritional sciences. I propose this is due to:

#### 1. Interest gaps

a) In the conservation sciences, much of the literature and publicity around consumption of wild meat is the prioritised 'crisis' surrounding the central and West African commercialisation of wild meat (e.g. de Merode *et al.*, 2004; Rose *et al.*, 2004) in which more high risk species such as the great apes, elephants and antelope gain most of the attention (Hilton-Taylor, 2000). The rising commercialisation of wild meat, destructive logging, high levels of poverty, political instability and rich biodiversity are all significant and challenging conservation issues and have received a great deal of publicity (Wilkie and Carpenter, 1999; Davies, 2002; Fa *et al.*, 2006), which could overshadow the more subtle activities of children.

b) Documented subsistence hunting in South Africa mainly concentrates on charismatic animals like

large ungulates, elephants and primates rather than small mammals (especially rats and rodents), birds, reptiles and insects. Less obvious natural resource use continues to be neglected in policy and practice (Shackleton and Shackleton, 2004<sup>b</sup>).

## 2. Methodological gaps

a) Hunting by children is informal, small scale, and seasonally dependent. It is a subtle activity that is not often mentioned as *hunting* by local people, but rather as *child's play* (van der Waal, 2004; Barany *et al.*, 2005) and is often therefore missed as a viable food securing activity.

b) Assessment of wild meat consumption is often overlooked due to survey error and informant bias. In southern Africa, wild meat and insects are traditionally considered among rural people to be nutritionally or culturally inferior to domestic meat (Fa *et al.*, 2002; East *et al.*, 2005) and they often do not consider wild birds, small mammals and insects as meat or a valuable source of protein or energy. The consumption of wild meat is down-played by rural informants due to the perceived superiority of purchased or introduced foods and hence goes undetected by researchers and practitioners.

c) Small animals are not commonly marketed and therefore can be easily overlooked, although there are some exceptions, as with the African mopane worm (Greyling and Potgieter, 2004) and the large industry surrounding it.

d) Small animal consumption tends to slip through the gaps of formal nutritional research and assessment because conventional food security survey indicators focus on household food security (Hoddinott, 1999; Ruel, 2003; Swindale and Blinsky, 2005), household level surveys miss the contribution of many wild meat meals that are caught, cooked and consumed in the forest separate to the household.

### **1.8. Objectives**

Briefly viewing the status of rural children in South Africa, one would describe their food security situation as a delicate and complex knot tightened by a myriad of cultural, social, economic and environmental drivers. This thesis aims to begin untying some of these knots, and gain insights into one of the strategies rural South African children adopt to increase their food quality and quantity.

Whilst the nutritional contribution of wild foods to nutrient adequacy may be clear, there remain important questions that are yet to be addressed:

- What is the independent role of wild foods relative to overall dietary quality and food security for children?
- What impact does HIV/AIDS have on the rate and frequency of subsistence harvesting of wild foods amongst rural children?
- How does the use of natural resources by rural children effect their psycho-social development?

### ***1.9. Description of thesis and layout of chapters***

The research process followed a ridged study design that relied on firstly developing a large quantitative data set that surveyed many children (850) across the Eastern Cape (Figure 1.1). The next step relied on refining this data by interviewing a smaller subset of children that could explore these initial findings using a combination of quantitative and qualitative data, then finally followed by the application of in depth participatory techniques that could further refine the exploration into the delicate dynamics involved in rural children's use of natural resources (Figure 1.1). The whole research process also relied on constant participant observation, photographic and film documentation. The chapters of this thesis have been designed to stand alone as separate papers for publication. Due to this format occasionally there may be some repetition within the thesis, such as descriptions of study sites and methodologies.

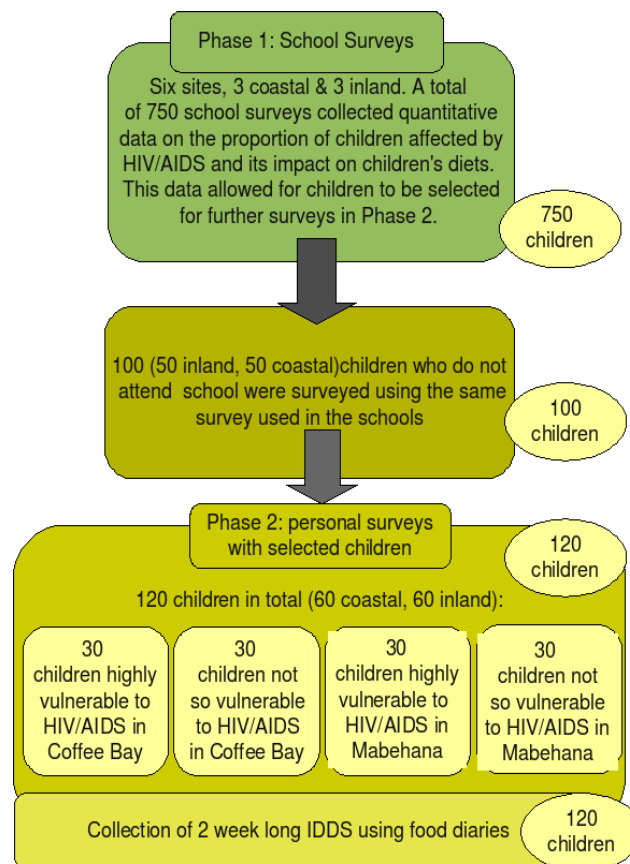


Figure 1.1. The research process

Chapter two makes the first tentative steps in investigating the role wild foods are having in the diets of children made vulnerable by HIV/AIDS. An assessment of three inland schools, three coastal schools, and 100 children, who do not attend school (50 inland and 50 coastal) creating a total of 850 children, was undertaken as a baseline study. This chapter describes the diets of children across very different regions of the Eastern Cape, and reveals the impact of HIV/AIDS vulnerability on wild food use by rural children, and reveals the variety of hunting and harvesting strategies adopted by the children. This chapter relies mainly on quantitative data and analysis.

Chapter three describes in further detail the coping strategies adopted by children to cope with their weak food security situation. A smaller subset of 120 children were interviewed in two of the six original sites from chapter two, these being the coastal site of Coffee Bay and the inland site of Mabehana. Within each of these sites 60 children were interviewed. This chapter draws mainly from

qualitative data collected from individual interviews and children's personal accounts documented in their interactive diaries.

Chapter four draws information from the same subset of children interviewed in chapter three, but illustrates the children's diets over a two week period using data extracted from the interactive food diaries kept by the 120 children. This chapter draws mainly from quantitative data, and describes down to species level the different species harvested by the children, while incorporating the impact of HIV/AIDS. This chapter is the most detailed and refined analysis of the children's diets in relation to HIV/AIDS vulnerability and their consumption of wild food.

Chapter five is a final discussion and conclusion. It integrates the key findings from the previous three chapters to present a holistic picture of the impact of HIV/AIDS on rural children's reliance on natural resources within the Eastern Cape, South Africa.

## *Chapter two:*

### *Wild food use by rural children within the context of HIV/AIDS, Eastern Cape*

*"There are eight children at home, we always eat bread."*

Babalo, 13 year old boy, Mabehana

#### **2.1. Introduction**

The former *bantustans*, or homelands of the apartheid government of South Africa, are places synonymous with poverty and broken families. Many children were separated from their parents through the migrant labour system of the old political regime (Bank, 2002). Today the political environment has changed, yet the broken families of the former Transkei and Ciskei are still a reality, particularly with the influences of urbanisation and HIV/AIDS, with South Africa having the highest HIV/AIDS prevalence rates in the world (UNAIDS/WHO, 2006). In this context, a more apt term for these so-called homelands would perhaps be *orphan-lands*.

The Eastern Cape province has the third highest number of people affected by HIV/AIDS in South Africa (667 000), which is 12 % of the total population of people living with AIDS in South Africa (Dorrington *et al.*, 2006). The Eastern Cape has 225 618 orphans, representing 15 % of the total number of orphans in the country, and 55 % of these children were orphaned though HIV/AIDS (Dorrington *et al.*, 2006). There were 40 000 new AIDS orphans in 2006, and Dorrington *et al.* (2006) estimate this number to raise well over 250 000 by 2015.

With the marching onslaught of HIV/AIDS in rural communities, getting enough food in rural areas of South Africa is becoming an increasingly difficult endeavour (Enwonwu and Warren, 2001; Gillespie *et al.*, 2001; Haddard and Gillespie, 2001; FAO, 2002; Piwoz and Preble, 2002; Save the children UK and Oxfam, 2002; de Waal and Tumshabe, 2003; SADC FANR VAC, 2003, Gari, 2004). The situation seems to be a downward spiral into chaos and loss. However, hope thrives in the most unexpected places, and it is in the use of natural resources by vulnerable rural children that we might begin to find transcendence in the face of the highest HIV/AIDS prevalence rates in the world (UNAIDS/WHO, 2006).

Wild foods are commonly utilised during times of heightened poverty or following shock events, such

as the retrenchment of a major bread winner, death in the family, loss of livestock or failure of a crop (Angelsen and Wunder, 2003; Paumgarten, 2005). In this latter context, wild foods are understood as performing a critical “safety-net” function for rural people (Byron and Arnold, 1999; Pattanayak and Sills, 2001, Shackleton *et al.*, 2002; Senaratne *et al.*, 2003). There is also evidence that wild foods are providing this vital safety-net function for rural people coping with the adverse effects of HIV/AIDS (Barany *et al.*, 2005; Torell *et al.*, 2006).

While the gathering of wild plant foods (High and Shackleton, 2000; Save the Children UK and Oxfam, 2002; Du Guerny and Hsu, 2004; FAO, 2004; Hunter and Twine, 2005), and large mammal hunting by rural people (Dwasi, 2002; Rao and McGowen, 2002; De Merode *et al.*, 2004; Quinlan, 2004) is widely recognised; our knowledge regarding the links between collection and consumption of wild foods and food security is underdeveloped, particularly the role of wild animal sourced protein (Bennett, 2002).

Anecdotal evidence has suggested that children are engaging in hunting and collection of wild foods, as well as trade and commercialisation of these resources independently to adults and household activities (Kaschula, 2007a; chapter one). These findings suggest that the subsistence and recreational hunting of small animals (especially rodents, birds, insects and small reptiles); collection of coastal resources; and harvesting of wild edible plants is at least equal, if not greater in terms of frequency and quantity of occurrence, to more consistently documented wild food harvesting activities by adults.

Despite the role of wild foods supporting vulnerable people's food security, nutrition and livelihoods, children's use of wild food often slips through the cracks of conventionally defined and assessed household food security, which usually does not distinguish individual diets, or individual wild food consumption independent from the household meals. A survey created to explore the individual diets of children made vulnerable by HIV/AIDS was carried out in six rural villages of the Eastern Cape of South Africa in 2006. The diets and livelihoods of vulnerable rural children were documented through individual interviews and participant observation. The diets of individual children were compared with the range of vulnerability to HIV/AIDS experienced by the children.

This chapter makes a preliminary exploration of the wild food based “safety-nets” adopted by children who are made vulnerable by HIV/AIDS in the Eastern Cape. It explores the diets of 750 schoolchildren and 100 children who did not attend school, within three inland and three coastal sites.

This chapter aims to verify the hypothesis that vulnerable rural children are engaging in the consumption of wild foods, and to determine to what extent wild foods are supplementing these children's domestic diets. In doing so, I test the hypothesis that there will be a positive association between vulnerability to HIV/AIDS effects and use of wild foods by rural children.

### *2.1.1. Key questions*

To understand the broader context of the impact of HIV/AIDS on children's use of wild foods, surveys investigating the following key questions were conducted:

- What is the composition of schoolchildren's diets?
  - What is the quality of the children's domestic diets?
  - Are rural children hunting and collecting wild foods to supplement their domestic diets?
- Is vulnerability to HIV/AIDS increasing rural children's consumption of wild foods?
- Are children involved in the commercialization of wild foods?
- How are children hunting/collecting/fishing wild foods?
- Do children think wild foods are healthy?

### *2.2. Study sites*

The surveys were distributed at six schools within five local administrative areas of the Eastern Cape province of South Africa. The three inland schools were in villages of Mount Frere, Mount Alyiff and Mabehana. The three coastal schools were in Ntubeni, Ncera and Coffee Bay. All of the sites are found within the former homeland of the Transkei, except for Ncera village which fell under the former Ciskei homeland (Table 2.1).



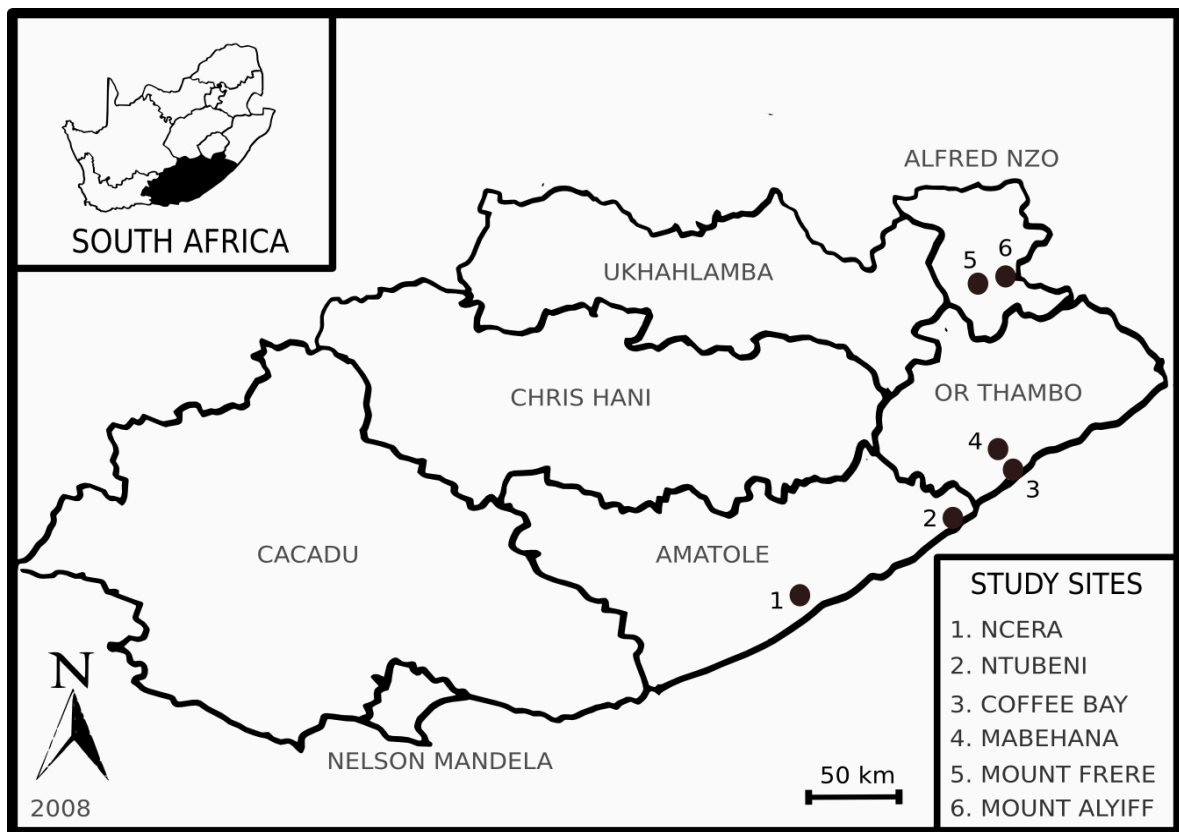


Figure 2.1: A map of the six study sites

Due to their history of exclusion and the migrant labour system of the previous apartheid government, today people in these sites experience high levels of rural poverty (Bank, 2002). The majority of households rely on government grants and remittances from urban family members (Leibbrandt *et al.*, 2000: Posel, 2001: Spiegel *et al.*, 1996). It is not uncommon to have a whole family surviving on a single pension. The people living in these villages are, for the most part, *amaXhosa*, with the local language being *isiXhosa*.

The King Sabata Dalindeybo (KSD) local administrative area had the highest HIV prevalence with 34 % of people with HIV, with prevalence raised by 10 % in two years between 2002 and 2004 (Table 2.1). The poverty levels are high among the six study sites, with KSD local administrative area having the lowest proportion of people living in poverty (71%) and Ngqushwa having the highest (80 %) proportion of people living in poverty (proportion of people who's total monthly income falls below R893 per person) (Table 2.1). The majority of household income comes in the form of monthly government social grants, with KSD having the lowest percent of people (63 %) reliant on social grants, and Mbashe having the highest (78 %) (Table 2.1).

Table 2.1: The socioeconomic and biophysical context of the six study sites (ECSECC (2007))

	Coastal sites			Inland sites		
	<i>Coffee Bay</i>	<i>Ntubeni</i>	<i>Ncera</i>	<i>Mabehana</i>	<i>Mount Frere</i>	<i>Mount Alyiff</i>
District Municipality	Oliver Thambo	Amatole	Amatole	Oliver Thambo	Alfred Nzo	Alfred Nzo
Local Service Area	King Sabata Dalindeyebo	Mbashe	Ngqushwa	King Sabata Dalindeyebo	Mount Frere	Mount Alyiff
Former homeland	Transkei	Transkei	Ciskei	Transkei	Transkei	Transkei
Coordinates	31° 58' 0" S, 29° 9' 0" E	32° 18' 0" S, 28° 48' 0" E	32° 49' 0" S, 26° 53' 0" E	31° 54' 0" S, 29° 4' 0" E	30° 55' 0" S, 28° 59' 0" E	30° 48' 0" S, 29° 22' 0" E
Rainfall (mm)	1000-1500	1000-1500	700-800	900-1200	800-1000	800-1000
Vegetation	Coastal forest and Valley Bushveld	Coastal forest and Valley Bushveld	Valley Bushveld and Central Lower Karoo	Coastal forest and Valley Bushveld	Highland/ Dohne Sourveld & Southern Tall Grassland	Highland/ Dohne Sourveld & Southern Tall Grassland
Total population of district (2001 Census)	415 227	253 378	84 230	415 227	158 144	9 407
People living in poverty 2001 (%) *	70	75	79	70	73	70
People living in poverty 2005 (%) *	71	78	80	71	77	74
Human Development Index (HDI)	0.50	0.42	0.46	0.50	0.47	0.45
Household income < than R1500 per month (%)	72	-	67	72	-	-
Of working age but not working (%)	85	-	-	85	68	68
Unemployed and looking for work (%)	35	76		35	72	72
Dependant on government social grants (%)	63	78	73	63	69	69
Access to clinics (%)	86	79	44	86	33 clinics	33 clinics
HIV Prevalence 2002	24	22	22	24	28	28
HIV Prevalence 2003	29	27	22	29	30	30
HIV Prevalence 2004	34	27	27	34	28	28
Access to roads in good condition (%)	22	77	6	22	-	-
Access to primary schools (%)	90	79	83	90	-	-
Functional Literacy: Age 20+, Completed Grade 7 or higher (%)	62	48	58	62	63	58

\* People living in poverty = proportion of people who's total monthly income falls below R893.00 per person.

### **2.3. Methodology**

For the school-based investigation on HIV/AIDS and wild food use among rural children, an interactive worksheet (appendix A) was administered in *isiXhosa* within the class room as a part of a class lesson I gave on HIV/AIDS and nutrition. The purpose of this worksheet was to quickly assess rural children's food intake, food security, wild food use and the impact of HIV/AIDS. The survey was also administered individually with non-school going children. Children between the ages of eight and eighteen were involved in this study, however there were a few young adults above this age who were attending school, and fell within the survey. The session began with my translator and I reintroducing ourselves to the class (or individual child). We then provided a clear overview of the study. We then requested permission from the child and guardian/parent/teacher to continue with the session. All the possible pros and cons of being involved in the study were expressed to the child and the respective adult responsible for the child. I was present during all the data collection activities, relying on translators and facilitators to reduce information gaps in the translation.

The worksheets captured information regarding the child's home-life situation with regards to HIV/AIDS, by using the emotionally sensitive proxy indicators developed by the SADC FANR Vulnerability Assessment Committee (2003). The proxy indicators for HIV/AIDS included the following questions:

1. Has there been a death in the family in the past two years?
2. Was this person sick before they died?
3. Is there anybody at home who is chronically ill?
4. Have either your mother or your father died?
5. Are there orphaned children living in your home?
6. Do people other than your mother and father look after you?

The use of proxy indicators does not a direct description of the level of an AIDS affected households, however it does provide a weighting to the household's vulnerability. It is generally agreed that while this indicator does not provide a completely accurate picture of the HIV/AIDS effect, it does provide a sensitive and ethical enquiry into household vulnerability to the impact of HIV/AIDS (SADC FANR Vulnerability Assessment Committee,2003). Children's households who did not show any or only one of these potential signs of a HIV/AIDS impact in their homes, were classified in this study as non-afflicted (affliction in this context describes the affliction of HIV/AIDS on a household, not on an individual person, i.e. it does not insinuate a individual person is infected). Children who reported an

affirmative answer to received two or more of the six proxies were classified as afflicted.

The worksheet conducted a simple 24 hour recall of the child's food intake and used the Individual Dietary Diversity Index (IDDI) methodology (Ruel, 2002; Swindle and Bilinsky, 2005) to assess the variety of foods needed for adequate nutrition by each child. An Individual Dietary Diversity Score (IDDS) for each child is what the IDDI uses to measure any child's current dietary status. It captures the variety of foods consumed by a particular child over a certain period (within this context, 24 hours), and then calculates a score by assigning all food types into eight separate groups. These groups include (Swindle and Bilinsky, 2005):

1. Grains, roots or tubers
2. Vitamin A-rich plant foods
3. Other fruits or vegetables
4. Meat, poultry, fish, seafood
5. Eggs
6. Pulses/legumes/nuts
7. Milk and milk products
8. Foods cooked in oil/fat

Therefore, a balanced or complete diet should receive a score of eight (FAO and WHO, 2002; Ruel, 2002; Swindle and Bilinsky, 2005). The worksheet also included a section that disaggregated the general consumption of wild plant and animal taxa, and conducted a 24 hour recall for wild food separate to the domestic meals and included a question alongside regarding each taxa of which species was consumed. Using these two separate quantitative data sets the impact of HIV/AIDS vulnerability on children's diet as well as the proportion of their diet that is sourced from the wild could be statistically analysed. The worksheet also included several questions regarding the nature of wild food collection and use. For example, the children's preferences regarding wild and domestic food, if they thought wild foods were healthy, if they sold wild foods, and how they collect/hunt and prepare it. This worksheet also placed special significance on where, how often and in what form do the children receive meat. As mentioned in chapter one, protein is not only a vital macro nutritional source desperately needed in the context of HIV/AIDS but also a vital nutritional component needed for healthy development among children. It was impracticable to probe in a similar fashion for all the other nutrients needed for healthy development, and so protein in the form of meat was the only nutrient investigated in this manner.

The worksheet was conducted within the local schools at the six different sites, three coastal and three inland (see section 2.3.). Worksheets were completed in the children's mother tongue, *isiXhosa*, and then translated for analysis. One hundred children on average were surveyed within each site. However it was recognized that not all children attended school (despite the law demanding it). A real impact of HIV/AIDS may be seen in the withdrawal of children from school because the household cannot afford the school fees, and the children may be required to take over household tasks previously performed by the an ailing AIDS sufferer within their home. Consequently we noted to include non-school going children in the survey. There were difficulties around including these children, as locating them was difficult, taking many hours. Consequently non-school going children were only assessed at two sites, one coastal (Coffee Bay) and one inland (Mabehana); 50 children were interviewed with the worksheet in each site, resulting in a total of 100 non-school going children included in the study. The classroom worksheet was personally filled out by the individual child, each question on the worksheet was discussed and the intended meaning was agreed upon. Thereafter, the child answered each question, very much like a standard worksheet they would have to fill out in a regular lesson.

The worksheet provided a quick and easy opportunity to quantify the children's activities regarding wild food collection. The worksheet also provided the opportunity to rank the children according to their vulnerability level, which was useful for further investigation into the impact of HIV/AIDS on natural resources use later on in the study (see chapter three, appendix A).

Data extracted from the worksheets was collated with Open Office Calc. A Chi squared test was used to test significances for the majority of the categorical questions, IDDS scores and vulnerability was assessed using a t-test, and the influence of vulnerability to HIV/AIDS on overall diet quality was examined using a One-way Anova. I assume that the children completed the worksheets honestly, and provided correct information and did not copy each other's responses. I also assume that the children recalled their diets accurately and did not forget to mention any foods they had eaten, they may of course be incidences whereby some components of meals would be more memorable than others, and children might accidentally omit these foods. I assume for the sake of this analysis that the children did not forget what they ate. This problem is dealt with in the chapter four, were I changed my methodology to eliminate this problem.

## 2.4. Results

### 2.4.1. The proportions of affliction within Eastern Cape households

The proxy indicators for an HIV/AIDS effect within the children's households provides a rough picture to what proportion of children are living in households effected by HIV/AIDS. Out of all the 850 children involved in the survey (both schoolchildren and non-school children) 34 % had no noticeable HIV/AIDS effect, i.e. none of these children showed any signs of the proxy indicators (Figure 2.2). These were classified as non-afflicted households. Children showing signs of affliction were high, with 66 % of the children answering at least two or more affirmative proxy indicator question (Figure 2.2). When these vulnerability scores are disaggregated, we see that out of the afflicted children 36 % of the children had one or two affirmative proxy indicators and 28% had three or four affirmative indicators of HIV/AIDS within their household. Only two percent of the children showing very high vulnerability to HIV/AIDS within their homes (Figure 2.2).

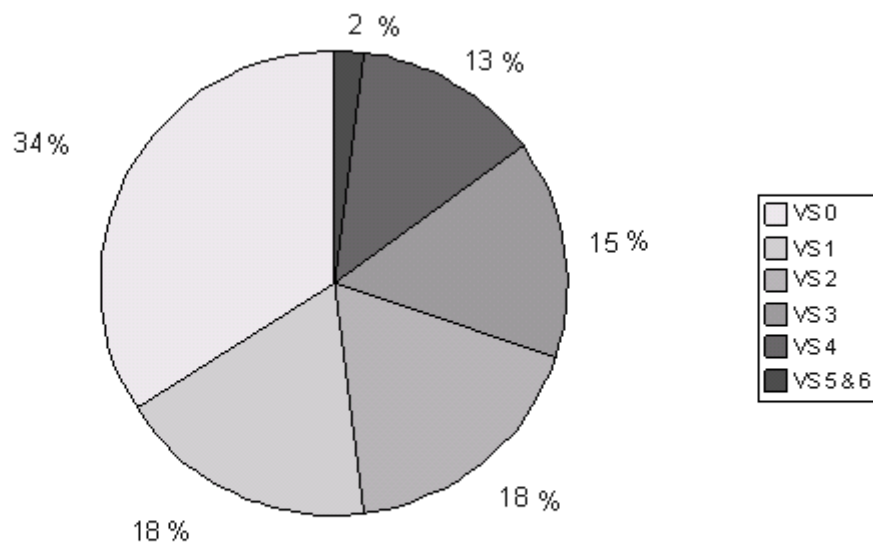


Figure 2.2. The proportion of children showing signs of living in a household affected by HIV/AIDS (VS= vulnerability score)

### 2.4.2. A typical rural child's diet in the Eastern Cape (school surveys, six sites)

How children felt about their diets did not always clearly correspond to their actual diet quality or quantity. The question was posed "Do you get enough to eat at home?" Within the coastal sites, the majority of afflicted (82 %) and non-afflicted (72 %) children felt that they received enough to eat at home, similarly the majority of inland children considered their diets to be adequate (66 % non

afflicted and 62 % afflicted). Even though these children thought their diets were of an adequate quality, the results from the IDDS proxies shows that the children's diets were on average considerably lower than the required IDDS standards set by the FAO (FAO and WHO, 2002).

Overall, the average domestic IDDS for the inland and coastal sites was  $3 \pm 1$ , which is 62 % below the required standards. Within the inland sites, wild foods increased the IDDS by 25 %, and 13 % within the coastal sites. For all the sites combined there were no significant differences found between afflicted and non-afflicted children's IDDS. However, within the coastal sites there was a significant difference identified with the percent contribution wild food made to the over all IDDS, with afflicted children having a 12 % higher contribution ( $p < 0.05$ ) of wild foods to their total diet than non-afflicted children (Table 2.2).

Table 2.2: Mean ( $\pm$  standard deviation) Individual Dietary Diversity Scores (IDDS) of afflicted and non-afflicted children in all three sites who attended school (t-test)

	Non-Afflicted		Afflicted		P value		Total IDDS for all children	
	Coastal n=153	Inland n=122	Coastal n=225	Inland n=250	Coastal	Inland	Coastal	Inland
Domestically sourced foods (IDDS)	$3 \pm 1$	$3 \pm 1$	$3 \pm 1$	$3 \pm 1$	0.458	0.834	$3 \pm 1$	$3 \pm 1$
Wild sourced foods (IDDS)	$1 \pm 2$	$2 \pm 2$	$2 \pm 2$	$2 \pm 2$	0.130	0.316	$1 \pm 2$	$2 \pm 2$
TOTAL IDDS	$4 \pm 3$	$5 \pm 3$	$5 \pm 3$	$5 \pm 3$	0.326	0.396	$4 \pm 2$	$5 \pm 3$
% Contribution of wild food to total diet	$22 \pm 23$	$27 \pm 24$	$34 \pm 25$	$37 \pm 26$	<b>0.024</b>	0.329	$25 \pm 24$	$36 \pm 26$

The influence of the children's vulnerability score on the IDDS results was assessed using a one-way Anova (Figure 2.3.). The domestic IDDS, the wild IDDS as well as the percent contribution of the wild IDDS to the total IDDS for school going children was assessed. No significant differences were identified. Although there were no significant differences, there was however a consistent pattern in the standard deviations within all the school children's results. Within both the domestic and wild IDDS there is a noticeably larger standard deviation among the most highly vulnerable children (i.e. with a vulnerability score of five and six). Regardless of the trajectory or shape of the graph, the standard deviation of diet quality increases extensively among these highly vulnerable children, due to the increasing variability of these highly vulnerable children's dietary diversity. What could be

causing this variability is unknown, however it could be suggested that there is a possible threshold of vulnerability, which when exceeded, a child's diet quality can range from very poor to better than non-afflicted children. It is possible that this large standard deviation is an indicator of the length of time since a major adverse impact has occurred within a household. Children surpassing this threshold and that have a very low diet quality may have had a recent loss of a major bread winner for example, which could drastically affect their diet quality. Children surpassing the threshold, but have a healthy diet quality may have had an adverse impact some time ago and has adopted strategies that can improve their diet quality, such as adoption by an extended family member, or wild food supplementation. Hunter *et al.* (2007) found that with a greater time lapse after the death of a household member was associated with an increased probability that members of the household would gather herbs.



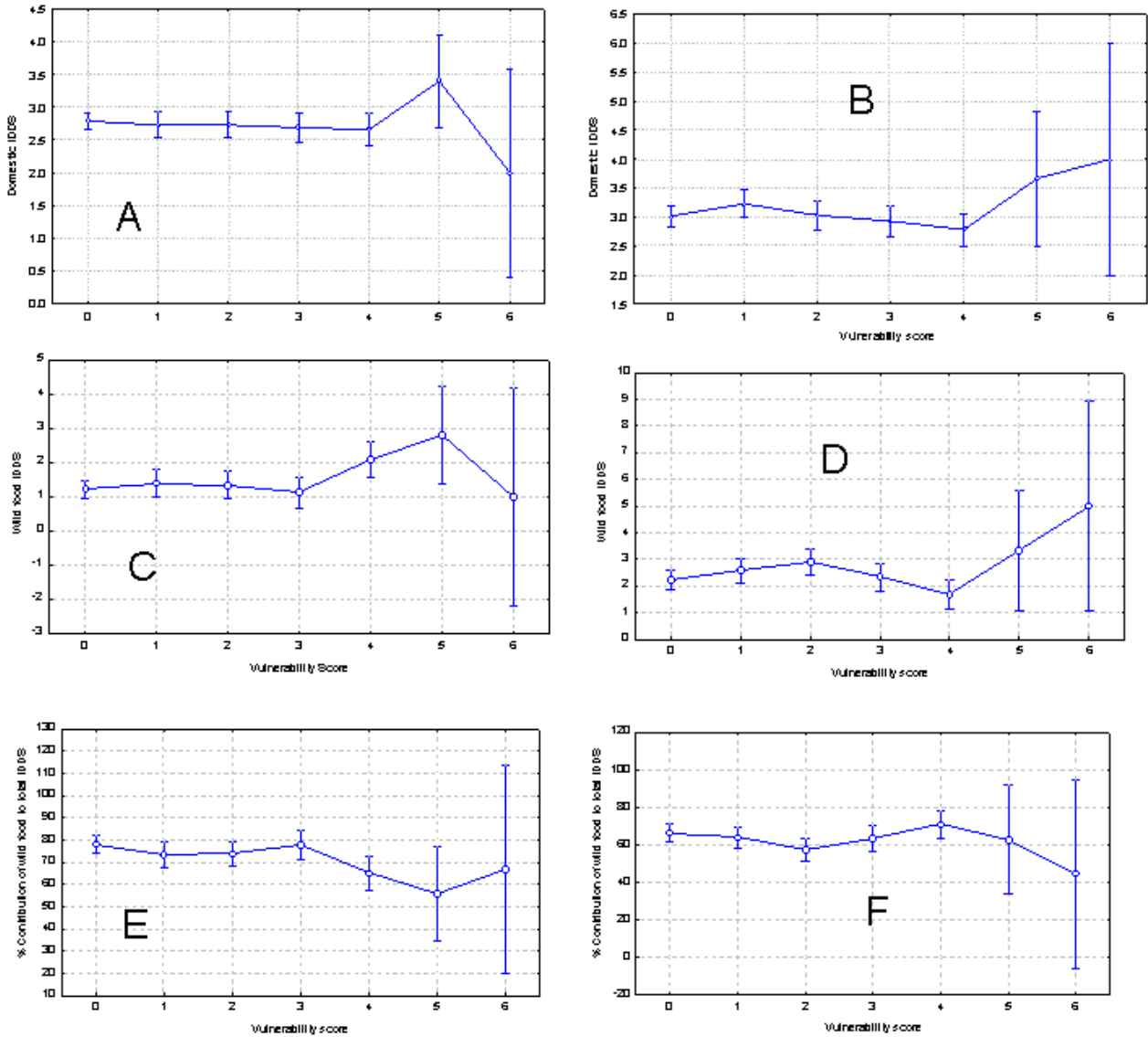


Figure 2.3: The change in IDDS across different vulnerability scores, one-way Anova. (A) domestic IDDS, coastal sites (B) domestic IDDS, inland sites. (C) wild sourced IDDS, coastal sites. (D) wild sourced IDDS inland sites. (E) % contribution wild foods were supplementing the total IDDS, coastal sites. (F) % contribution wild foods were supplementing the total IDDS, inland sites

Wild food supplementation was found to be a common practice among the majority of the children surveyed. Overall, out of all the children interviewed, 62 % were found to supplement their diets with wild foods, with the inland sites having a higher proportion (70 %) of children supplementing their diets with wild food than coastal children (59 %) (Table 2.3).

Table 2.3: The proportion of school children supplementing their diets with wild foods

	% of children who supplemented their diets with wild foods
Inland (n= 372)	70
Coastal (n= 378)	59
Total school going children (n= 750)	64

Within the inland sites, 56 % of the afflicted and 47 % of non-afflicted children had half of their diet supplemented with wild foods. In the coastal sites, 27 % of afflicted and 23 % of non-afflicted children's diets comprised of over half wild foods. This reveals that there are many children within both inland and coastal sites that rely on wild foods to make up half of their food intake. For 38 % of the children, dietary diversity would decline by 50 % if wild foods were removed from the children's diets, which could create severe nutritional deficiencies and health problems.

The majority of children ate three meals a day. There were no significant differences in the number of meals a child consumed per day and their affliction status. While the children were eating three meals a day, their quality and quantity of these meals were poor.

Protein rich foods, particularly animal based protein were the most absent food group from the children's diets. Further investigation revealed that meat consumption was found to be more of a weekly or monthly undertaking among the children surveyed. Within the inland site, out of those children who answered the question "how often do you eat meat?", the options of "every day, once per week and once per month" were given; 72 % of the afflicted and 84 % of the non-afflicted children were consuming meat once per month, which was usually on a pension pay-out day. The coastal children seemed to eat meat more frequently than the inland children; with over half of the afflicted (52 %) and the non-afflicted children (54 %) stating they ate meat once per week, and 35 % of the non-afflicted and 34 % afflicted stated they ate meat once per month. Daily meat consumption was low at both the inland and coastal sites (Table 2.4). There were no significant differences between the afflicted and non- afflicted children. The high frequency of monthly meat consumption supports the children's statements that the majority of their domestic meat is consumed during the monthly pension pay-out when households can afford to purchase meat. The higher frequency of meat consumption among coastal children could be indicative of the weekend based harvesting of shellfish, fishing and hunting (Table 2.4).

Table 2.4: The percentage and how often afflicted and non- afflicted school children consume meat in coastal and inland sites within Eastern Cape schools (Chi-squared test)

	Non- Afflicted (%)		Afflicted (%)		P value		Chi-squared	
	Coastal n=153	Inland n=122	Coastal n=225	Inland n=250	Coastal	Inland	Coastal	Inland
Eat meat once a day	11	7	14	4	0.663	0.561	0.362	0.177
Eat meat once a week	54	21	52	12	0.773	0.306	0.3089	0.186
Eat meat once a month	35	72	34	84	1	1	0.492	0.540

Among the schoolchildren there was a significant difference between afflicted and non-afflicted children sourcing their meat from domestic sources. There no significant differences found in the relationship between vulnerability among the other tests (Table 2.5). What is interesting however is that afflicted inland group had double the amount of children sourcing their meat from a combination of wild and domestic sources, compared to the non-afflicted children within these sites. As expected with more vulnerable children, they had less access to domestic meat sources than non-afflicted children.

Table 2.5: Sources of meat consumed by afflicted and non afflicted children in coastal and inland sites within Eastern Cape schools (Chi-squared test)

	Non- Afflicted (%)		Afflicted (%)		P value		Chi-squared	
	Coastal n=153	Inland n=122	Coastal n=225	Inland n=250	Coastal	Inland	Coastal	Inland
Wild animals	4	6	4	6	1	1	0.530	0.584
Domestic sources	61	72	61	50	<0.001	0.172	0.001	0.055
Wild animals and domestic sources	35	22	35	44	0.882	0.407	0.436	0.334

#### 2.4.3. A typical diet of children who do not attend school (Coffee Bay and Mabehana)

As mentioned earlier a smaller subset of 100 children who did not attend school was surveyed in two of the sites, the inland site of Mabehana and the coastal site of Coffee Bay. These children who did not go to school seemed to have more realistic perceptions of the adequacy of their diet intake than the school going children. Within Coffee Bay both the afflicted (60 %) and non-afflicted (75 %) children felt they did not get enough to eat. The non-school going children at Mabehana showed a different attitude to their diets than the rest of the children, non-afflicted children considered their food intake

to be low, with 66 % of the children stating they did not get enough food at home, were as 77 % of the afflicted children (the children expected to have poorer diets due to their affliction status) claimed they got enough to eat at home, and 33 % not getting enough food. Nevertheless, the majority of these children considered their diets to be poor, which is consistent with their actual diets, which were found to be of poor quality. What factors could be influencing the accuracy of their perceptions relative to the perceptions of schoolchildren is unknown, but it could be suggested that their access to food is poorer than schoolchildren therefore making their poor diets more apparent and obvious, ultimately making them more aware of their poor diet quality than schoolchildren.

On average non-school going children had a domestic IDDS of  $2 \pm 1$ , which is 75 % lower than the required IDDS (Table 2.6) and less than the  $3 \pm 1$  IDDS of school going children. However, the consumption of wild foods raised the average IDDS by 13 % within the coastal and inland sites. There were no significant differences between afflicted and non-afflicted children's IDDS scores. Diets were fairly consistent among all the children. The contribution wild food made to the total IDDS for each child was not significantly higher for afflicted children than non-afflicted children for the inland sites or for any of the non-school children (Table 2.6).

*Table 2.6: Mean (standard deviation) Individual Dietary Diversity Scores (IDDS) of afflicted and non-afflicted children in a Coffee Bay and Mabehana sites who do not attend school (t-test)*

	<i>Non-afflicted</i>		<i>Afflicted</i>		<i>P value</i>		<i>Total IDDS for all children</i>	
	<i>Coffee Bay n=15</i>	<i>Mabehana n=14</i>	<i>Coffee Bay n=38</i>	<i>Mabehana n=33</i>	<i>Coffee Bay</i>	<i>Mabehana</i>	<i>Coffee Bay</i>	<i>Mabehana</i>
Domestically sourced foods (IDDS)	$2 \pm 1$	$2 \pm 1$	$2 \pm 1$	$2 \pm 1$	0.354	0.270	$2 \pm 1$	$2 \pm 1$
Wild sourced foods (IDDS)	$0 \pm 1$	$2 \pm 1$	$1 \pm 1$	$2 \pm 1$	0.277	0.351	$1 \pm 1$	$0 \pm 1$
TOTAL IDDS	$3 \pm 2$	$3 \pm 2$	$3 \pm 2$	$3 \pm 1$	0.705	0.940	$3 \pm 2$	$3 \pm 1$
% Contribution of wild food to total diet	$27 \pm 26$	$16 \pm 22$	$19 \pm 22$	$11 \pm 23$	0.247	0.475	$21 \pm 23$	$13 \pm 23$

Wild food supplementation was also found among children not attending school. A total of 40 % of children were identified supplementing their diets with wild foods (Table 2.7). More children in the coastal site of Coffee Bay (51 %), supplemented their diets with wild foods than inland children (28 %) (Table 2.7) ( $\chi^2=5.63$ ;  $p < 0.05$ ).

*Table 2.7: The proportion of children not attending school who supplement their diets with wild foods*

	% of children who supplemented their diets with wild foods
Mabehana (n= 47)	28
Coffee Bay (n= 53)	51
Total Non-school going (n= 100)	40
TOTAL children interviewed (n=850)	62

Within the inland sites, 15 % of afflicted and 14 % of the non-afflicted children had over half their diet supplemented by wild foods. In the coastal sites 26 % afflicted and 18 % non-afflicted children had over half their diet supplemented by wild foods. The coastal sites showed that afflicted children had a significantly higher proportion of wild food in their diets than non-afflicted children.

As with the school children, animal based protein was the least consumed food group among the children who did not attend school. Within Coffee Bay, meat consumption among non-afflicted (39 %) and afflicted (14 %) children not attending school was low for weekly intervals. A significantly higher proportion of afflicted children in Coffee Bay ate meat on a monthly basis (83 %,  $p < 0.001$ ) compared to the non-afflicted children (39 %) (Table 2.8), supporting the argument that domestic meat consumption occurs mainly during the monthly pension pay-out when households have ready cash to purchase meat. Within the inland site of Mabehana, the majority of the afflicted (64 %) and non-afflicted (63 %) children ate meat once a day; these results are not consistent with the previous findings (Table 2.8). This daily consumption of meat could have been skewed by several reasons. The first is while conducting these surveys, there had been an outbreak of swine fever in this district, and disease control were capturing and slaughtering all the pigs in the village. Some people had said that they slaughtered and ate the pigs before the disease control could come and confiscated their pork, this could have increased many of the children's usual meat intake. Secondly, the survey did not differentiate between wild meat consumption and domestic meat consumption. In chapter four it was found that wild meat consumption occurred more frequently than domestic meat consumption, which could indicate why children were eating meat on a daily basis within Mabehana in this survey, rather than the monthly basis found in the school surveys.

Table 2.8: The percentage and how often afflicted and non-afflicted children consume meat in a Coffee Bay and Mabehana sites who do not attend school (Chi-squared test)

	Non-Afflicted (%)		Afflicted (%)		P value	
	Coffee Bay n=15	Mabehana n=14	Coffee Bay n=38	Mabehana n=33	Coffee Bay	Mabehana
Eat meat once a day	22	63	3	64	0.194	0.367
Eat meat once a week	39	14	14	8	0.546	0.268
Eat meat once a month	39	21	83	28	<0.001	0.187

Among the children who did not attend school, there were significant differences in where afflicted and non-afflicted children's sourced their meat (Table 2.9). Within both Coffee Bay and Mabehana, a significantly higher proportion of afflicted children sourced their meat from the wild, compared to non-afflicted children ( $p < 0.001$ ) (Table 2.9). The inland site also showed that afflicted children sourced less of their meat from domestic sources, than non-afflicted children ( $p < 0.001$ ) (Table 2.9). Generally, the afflicted children sourced their meat from a combination of wild and domestic sources, with no non-afflicted children relying on a combination of sources ( $p < 0.001$ ) (Table 2.9). These results clearly indicate that more afflicted children source their meat from the wild than non-afflicted children, and that wild meat is supplemented to domestic meat sources more by afflicted children in both the sites than non-afflicted children.

Table 2.9: Sources of meat consumed by afflicted and non-afflicted children in Coffee Bay and Mabehana sites who do not attend school (Chi-squared test)

	Non-Afflicted (%)		Afflicted (%)		P value		Chi-squared	
	Coffee Bay n=15	Mabehana n=14	Coffee Bay n=38	Mabehana n=33	Coffee Bay	Mabehana	Coffee Bay	Mabehana
wild animals	39	16	0	13	<0.001	<0.001	0.000	0.000
domestic sources	61	84	53	20	<0.001	<0.001	0.000	0.000
wild animals and domestic sources	Sample to low	Sample to low	47	67	–	–	–	–

#### 2.4.4. The impact of HIV/AIDS on hunting and collecting wild foods among school children

Within the coastal and inland sites consumption of wild animals and plants was seen to be a common activity among the majority of school children. Table 2.10 shows the differences in afflicted and non-afflicted children's consumption of wild foods. The question posed was, “Do you eat any of the

following wild foods?” The proportion of school children that answered yes to this question, are shown below in Table 2.10. Among both the afflicted and non-afflicted school children the presence of wild food consumption was high, with both groups claiming they consumed mammals, birds, reptiles, coastal resources (shellfish and fish), insects, wild spinaches, mushrooms and wild fruit. There were no significant differences between afflicted and non-afflicted schoolchildren with regards to their consumption of wild foods (Table 2.10).

Table 2.10: Percent of afflicted and non-afflicted school going children eating wild foods sourced from separate taxa (Chi-squared test)

	<i>Non- Afflicted (%)</i>		<i>Afflicted (%)</i>		<i>P value</i>		<i>Chi-squared</i>	
	<i>Coastal n=153</i>	<i>Inland n=122</i>	<i>Coastal n=225</i>	<i>Inland n=250</i>	<i>Coastal</i>	<i>Inland</i>	<i>Coastal</i>	<i>Inland</i>
Mammals	71	48	75	44	0.534	0.570	0.316	0.335
Birds	67	48	62	56	0.007	0.257	0.005	0.161
Reptiles	1	2	5	3	0.097	0.651	0.105	0.500
Coastal resources	79	14	77	15	0.733	0.841	0.432	0.500
Insects	7	6	8	5	0.788	0.756	0.500	0.500
Wild spinaches	73	90	70	95	0.638	0.795	0.377	0.141
Mushrooms	62	57	68	63	0.374	0.387	0.229	0.235
Wild fruit	83	70	87	66	0.428	0.5443	0.276	0.325

Generally within the inland and coastal sites, more afflicted schoolchildren had wild foods present in their diets within the last 24 hours, than non-afflicted children, however they were not significantly higher (Table 2.11).

Table 2.11: Percent of afflicted and non-afflicted school-going children eating wild foods sourced from separate taxa within the last 24 hours (Chi-squared test)

	<i>Non- Afflicted (%)</i>		<i>Afflicted (%)</i>		<i>P value</i>		<i>Chi-squared</i>	
	<i>Coastal n=153</i>	<i>Inland n=122</i>	<i>Coastal n=225</i>	<i>Inland n=250</i>	<i>Coastal</i>	<i>Inland</i>	<i>Coastal</i>	<i>Inland</i>
Mammals	15	11	19	12	0.452	0.825	0.286	0.5
Birds	16	14	20	14	0.462	1	0.580	1
Reptiles	1	Sample to low	2	2	0.561	0.155	0.500	0.249
Coastal resources	23	5	31	8	0.203	0.360	0.132	0.265
Insects	1	Sample to low	1	2	1	0.155	1	0.249
Wild spinaches	25	26	23	32	0.741	0.350	0.434	0.218
Mushrooms	10	11	16	10	0.207	0.818	0.20	0.500
Wild fruit	25	14	34	16	0.1629	0.692	0.146	0.422

#### 2.4.5. The impact of HIV/AIDS on hunting and collecting wild foods among children not attending school

With those children who did not attend school, there are noticeable differences between afflicted and non-afflicted children's consumption of wild foods. Within Coffee Bay, afflicted children consumed more wild foods (mammals, birds, reptiles, coastal resources, insects, wild spinaches, mushrooms and wild fruit;  $p < 0.001$ ) than non-afflicted children (Table 2.12). Similarly within the inland site wild food consumption was higher among afflicted children (mammals, birds, coastal resources,  $p < 0.001$ ; wild spinaches,  $p < 0.001$ ; mushrooms,  $p < 0.001$  and wild fruit,  $p < 0.001$ ) than non-afflicted children (Table 2.12).



Table 2.12: Percent of afflicted and non-afflicted non-school going children consuming wildfoods sourced from separate taxa (Chi-squared test)

	Non- Afflicted (%)		Afflicted (%)		P value		Chi-squared	
	Coffee Bay n=15	Mabehana n=14	Coffee Bay n=38	Mabehana n=33	Coffee Bay	Mabehana	Coffee Bay	Mabehana
Mammals	20	6	84	29	<0.001	<0.001	0.000	0.000
Birds	20	15	87	43	<0.001	<0.001	0.000	0.000
Reptiles	Sample to low	12	5	21	<0.001	0.0864	0.000	0.063
Coastal resources	33	9	100	29	<0.001	<0.001	0.000	0.002
Insects	Sample to low	Saple to low	10	Sample to low	<0.001	1	0.000	0.000
Wild spinaches	20	15	100	36	<0.001	<0.001	0.000	0.000
Mushrooms	33	15	100	29	<0.001	<0.05	0.000	0.012
Wild fruit	27	12	100	29	<0.001	<0.05	0.000	0.002

Among the non-schoolchildren there were significantly higher proportions of afflicted children having wild food present in the diets within the last 24 hours (Table 2.13). The differences in consumption of taxa between afflicted and non-afflicted children among children who do not attend school are extensive. For example, 66 % more afflicted children at Mabehana had mammals in their diet than the non-afflicted children ( $p < 0.001$ ) (Table 2.13). Reptiles and insects are usually considered undesirable for eating, yet 88 % of afflicted children in Mabehana ate reptiles, and 94 % of the afflicted children in Mabehana ate insects, while there were no non-afflicted children who did not go to school who ate reptiles or insects ( $p < 0.001$ ) (Table 2.13).

Table 2.13: Percent of afflicted and non-afflicted non-school going children consuming wild foods sourced from separate taxa within the last 24 hours (Chi-squared test)

	Non- Afflicted (%)		Afflicted (%)		P value		Chi-squared	
	Coffee Bay n=15	Mabehana n=14	Coffee Bay n=38	Mabehana n=33	Coffee Bay	Mabehana	Coffee Bay	Mabehana
Mammals	Sample to low	7	8	73	<0.001	<0.001	0.000	0.000
Birds	Sample to low	14	11	33	<0.001	<0.001	0.000	0.000
Reptiles	Sample to low	Sample to low	Sample to low	88	-	<0.001	-	0.000
Coastal resources	13	Sample to low	32	61	<0.001	<0.001	0.000	0.000
Insects	Sample to low	Sample to low	Sample to low	94	-	<0.001	-	0.000
Wild spinaches	7	21	50	15	<0.001	0.269	0.000	0.1788
Mushrooms	Sample to low	Sample to low	11	33	<0.001	<0.001	0.000	0.000
Wild fruit	7	7	16	36	0.037	<0.001	0.000	0.000

#### 2.4.6. The impact of HIV/AIDS and wild food commercialization

Children were engaging in commercialization of natural resources. The questions, “do you sell wild foods?” and “to whom do you sell?” was posed within the worksheets. Twenty eight percent of inland and 21 % of coastal schoolchildren were selling wild foods. There were no significant differences between afflicted and non-afflicted school children's commercialization of wild foods, however about 11% more afflicted children were selling wild foods than non-afflicted children. Within the inland sites, the majority of those children selling wild animals and plants to local traditional healers (80 %), while in the coastal areas wild foods were mainly sold to tourists (61 %).

A large percentage of coastal non-school children (47 %) and small proportion of inland non-school children (4 %) admitted to selling wild foods. Among the inland non-school children, a significantly higher proportion of afflicted children were selling wild foods compared to the non-afflicted children (15 %,  $p < 0.001$ ).

#### 2.4.7. Wild food collection strategies

Children hunted or collected wild foods for a number of reasons. The most common response within coastal (37 %) and inland sites (48 %), was that they enjoyed the taste of wild foods (there was no significant difference between afflicted and non-afflicted children among all six sites). The second most common response was the need to supplement their poor diets, admitting that hunger drew them to eat wild foods (coastal, 27 % and inland, 34 %; there were no significant differences between the afflicted and non-afflicted children within the inland and coastal sites). Within the coastal sites, the third most common reason for consuming wild food was that they just followed their friends and family, and copied what they did (22 %). Within the inland sites

however, the third most common reason was that they sold much of the wild food that they collected or hunted (10 %). Other reasons for hunting or collecting wild food among the school going children, was that their parents sent them to collect food, or traditional healers sent them to collect wild plants or animals for medicines.



Figure 2.4: A group of boys at Nqabara, near the Ntubeni site, skinning a monitor lizard. The skin was sold to local healers, the boys ate the meat



Figure 2.5: Hunting dogs at Coffee Bay trying to flush out a snake

Hunting with dogs was observed exclusively with boys; girls did not ordinarily participate in these hunting trips. I did enquire if girls sometimes joined in, and they said that there were occasions when girls came, but this was not often. Hunting with dogs usually began with boys going house to house, urging other boys to hunt with them. Boys would then round up their dogs (collectively the dog packs would range from 2-15), then the boys would enter the forests, armed with sticks. Chanting, whistling and screaming by the boys would excite both the dogs and the other boys themselves. The dogs then fan out into the forest

and begin barking once they have cornered something; if the dogs don't manage to kill the prey the boys finish the animal off themselves with their sticks. Then either the animal would be prepared and cooked within the forest or taken home to be shared and eaten

Within the inland sites, most children cooked or prepared their wild food meals at home (71 %),



Figure 2.6: A boy at Mabehana demonstrating how he uses his sling shot (*itolo*)

alternatively they cooked their wild food where they collected it (19 %), and 10 % stated they ate their wild food raw. Within the coastal sites, over half the children (56 %) cooked or prepared their wild food meals where they collected or hunted it. The remainder of the children stated they either cook the meals at home (34 %) or eat it raw (10 %) (differences between afflicted and non-afflicted children's wild food preparation was not significant).

However, the non-school going afflicted children showed some significant differences to their non-afflicted counterparts, when it came to where wild foods were prepared and cooked. There was a significantly higher proportion of non-afflicted children than afflicted children (Mabehana 15 %,  $p < 0.05$ ; Coffee Bay,

67 %,  $p < 0.001$ ), that cooked their meals at home. While a significantly higher proportion of afflicted children than non-afflicted children (Mabehana 30 %,  $p < 0.001$ ; Coffee Bay 13 %,  $p < 0.001$ ) prepared and cooked their meals where they collected or hunted them.

Another method for hunting which was popular among boys and girls to hunt birds was the use of a sling shot or *itolo*. This forked stick with a rubber sling would be an accurate hunting tool, and one boy in particular showed me the precision to which this tool could kill a bird. Birds were mostly hunted around the homestead, and bird hunting was opportunistic in nature.

Traps and nets were also used; however I personally did not see any. I was only informed of these modes of hunting by the children themselves. Wire snares were set in the forest, and were checked regularly, snaring was cited by 16 % of coastal children as a mode of hunting. Children in the inland sites did mention snaring or trapping as a hunting technique. Within the coastal sites bird and rodent traps were made by baiting an area of ground with bread or corn, with a large flat stone resting above

it, which was propped up with a short stick. When a small creature would come to investigate the food the string was pulled and the stone crushed the unsuspecting rodent or bird.

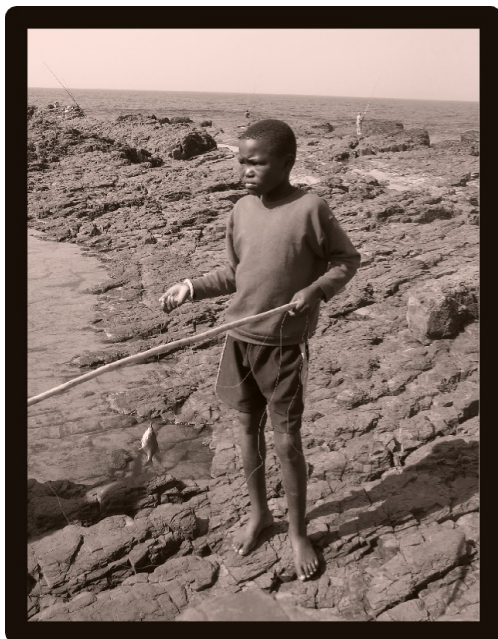


Figure 2.7: A teenage boy at Coffee Bay using a fishing rod he made himself to catch fish

Fishing was common among boys along coastlines or rivers. Within the coastal sites, 23 % of the children who ate wild foods stated they fished using line and tackle, and 12 % claimed to use fishing nets. Within the inland sites, 12 % of the children stated they used line and tackle to fish, and 25 % used fishing nets. Among non-schooling children line fishing was significantly higher among afflicted children than non-afflicted children (Coffee Bay, 40 %,  $p < 0.001$ ). The type of equipment ranged from complicated and expensive equipment (often donated by backpackers or fisherman at Coffee Bay) or to the fishing line and hand method. Hooks were sharpened on stones and bait was usually surrounding shellfish or polychaete worms.

Shellfish collection was common by both girls and boys, but mainly dominated by women and girls. *Uluxa* is used to break shellfish away from the rocks. An *uluxa* was usually made from an old suspension rod from a car. Enamel bowls or buckets were used to collect and transport the shellfish, and the majority of the shellfish was shelled at the collection site.

#### 2.4.8. Children's perceptions of the health benefits of eating wild foods

Children were almost evenly split between believing wild foods were healthy or not. Within the coastal sites over half the children (57 %) believed that wild foods were healthy, similarly within the inland areas, just over half the children (52 %) believed that wild foods are were healthy. There were however significant differences between afflicted and non-afflicted children's perceptions of the health-value of wild foods. Wild foods were generally considered healthier among non-afflicted children (schoolchildren 26 %,  $p < 0.001$ ; non-school going children 15 %,  $p < 0.001$ ).

## **2.5. Discussion**

### *2.5.1. A typical rural child's diet in the Eastern Cape*

School children's perceptions of the quality of their domestic diets were not useful indicators of children's overall dietary health. The majority of school children stated that their domestic diets were adequate; however the majority of children who were unable to attend school considered their diets to be inadequate. The results from the 24-hour diet recall indicates that, on average, domestic diets were not very diverse and therefore were of poor quality (62 % lower than the required standards set by the FAO). However, 62 % of all the children interviewed (both non-school and school going) supplemented their diets with wild foods. Dietary diversity showed a 13 % increase when wild food supplementation occurred. Although there was not a significant difference in afflicted and non-afflicted children who had over half their diet supplemented by wild foods, all afflicted children had marginally higher proportions with the majority of their diet supplemented by wild foods, than non-afflicted children. While there are no significant trends regarding the supplementation of wild food and a child's vulnerability to HIV/AIDS, it is clear that wild food supplementation is a commonly used activity to secure food among rural children within the Eastern cape, and for specific individuals wild foods are invaluable as they make up most of their diet (70% of dietary diversity comprised of wild foods).

The noticeably larger range of diet quality found among children with a vulnerability score of five and six, could indicate a possible threshold of vulnerability within which a highly randomized or chaotic diet quality ensues according to the specific conditions placed on a child in those particularly vulnerable circumstances. Theoretically this chaotic diet quality could result from children spending either more time securing a suitable diet, or being completely unable to gain access to a diverse diet. For example the highly vulnerable children found in the lowest range of diet quality (those scoring a zero or one food group) could have recently been made vulnerable, with the loss of a breadwinner or primary caregiver, and therefore has not gained access to alternative food securing techniques (i.e. begging, hunting, fishing, etc.), or has not found an alternative situation within which to live yet (i.e. adoption or employment). Those children's diets which were healthy and very diverse (those children scoring full IDDS scores) could have been vulnerable for longer periods and therefore developed successful strategies that have improved their diets to the required levels. Therefore, I suggest that there could be a possible threshold in vulnerability that once surpassed which can result in a wide variance in diet quality. This variance could be indicating the length of time since a major adverse impact has occurred within a household, and children with low diet quality are those children recently



affected by the this impact, and those with high diet quality are those children who were affected some time ago and have developed strategies to cope with food shortages and thus improved their diet. This is merely a suggestion of what could be causing this large standard deviation in diet quality among the most vulnerable children. We need to investigate this further, as there could be a myriad of factors that could be influencing this pattern.

While most of the children ate three meals a day, the majority of these meals were homogeneous, and most often dominated by carbohydrates. This is consistent with other diet quality research in rural South Africa (Steyn *et al.*, 1993; van der Waal, 2004). Meat was the most absent food group within children's domestic diets, and was most often sourced on a monthly basis at the pension pay-out day, when people could afford to buy meat. It seems from this initial data that although children are receiving monthly meat meals, that they could be supplementing this lack of meat with wild animal protein sources. The findings from this preliminary study certainly support this suggestion. In other parts of Africa for example, an estimated 20 % of the animal protein in Nigeria is derived from wild food sources. In Ghana and Zaire, a review by Panayotou and Ashton (1992) found that wild meats were relied upon as the primary animal protein source by about 75 % of the population. While we know that children are eating wild animals which enrich their poor protein intake with the domestic context, there is still further detail required. We need to investigate what contribution wild meat is playing in the children's diets compared to domestic meats. This would require investigating the nutritionally quality of the wild meat compared to domestic meat, as well as the frequency of consumption of wild meat compared to domestic meat.

There did not seem to be any significant trends between inland sites and coastal sites, other than coastal children had access to coastal foods such as shellfish and fish. While these are very nutritious, there wasn't a significant difference between the coastal and inland children's diet quality. There however differences between childrens' diet quality who attended school and children who did not. Children that did not attend school had on average a 13 % lower domestic IDDS score than schoolchildren. Out of all the children interviewed who did not attend school, 51 % of them claimed they did not attend school because their families could not afford the school fees and 12 % could not afford the uniforms. This indicates non-school childrens' average household access to financial assets was lower than schoolchildren. Having less money, these households would thus be less equipped to spend money on food. Another explanation for non-school childrens' reduced diet quality could be omission from the school feeding schemes. Due to the fact that they do not attend school, these

children subsequently do not have access to the food from school feeding schemes.

### *2.5.2. The impact of HIV/AIDS on hunting and collecting wild foods among rural Eastern Cape children*

Overall, afflicted children hunt and collect more wild foods, but only when they are not in school. The 24-hour recall of wild food consumption also revealed high wild food consumption among afflicted children. While the schoolchildren did not show a significant difference between afflicted and non-afflicted, the children more vulnerable to the impacts of HIV/AIDS generally had a higher incidence of hunting and collecting wild foods than non-afflicted children. However, while the schoolchildren do not show significant trends with regards to the impact of HIV/AIDS on hunting and collecting wild foods, the smaller sub-group of children who did not go to school showed a consistent and significant relationship with regards to the impact of HIV/AIDS on wild food collection and hunting. Afflicted children were found to hunt more mammals, birds, reptiles and more insects than non-afflicted children. This vulnerable group also collected more shellfish, wild fruit, and wild spinaches than non-afflicted children. It could be assumed that this sub-group of children do not have the resources available to them to attend school, or perhaps there are labour losses within the household (which is expected for HIV/AIDS afflicted households, de Waal and Tumshabe, 2003) which are keeping the children occupied at home, and therefore out of school. If this is the case, these children might spend more time in the vicinity of forests, rivers, grasslands, or the coast, than schoolchildren. While they are occupied with other activities, such as fuel wood collection, herding cattle, collecting water, washing, etc. they have frequent access to the habitats that contain many of the species they hunt and collect for food. Afflicted children would presumably have a greater incentive to hunt and collect, as it is commonly agreed that afflicted households, and therefore the children living within them, have reduced food security than non-afflicted households (Enwonwu and Warren, 2001; Gillespie *et al.*, 2001; Haddard and Gillespie, 2001; FAO, 2002; Piwoz and Preble, 2002; Save the children UK and Oxfam, 2002; de Waal and Tumshabe, 2003; SADC FANR VAC, 2003; Gari, 2004). This could explain the significantly higher incidences of hunting and collecting wild food by afflicted children who do not attend school, than non-afflicted children of this sub group.

### *2.5.3. The impact of HIV/AIDS and wild food commercialization*

The commercialization of wild foods contributed to the livelihoods of selected vulnerable children engaging in wild food commercialization. While the majority of children were not selling their wild foods, 47% of children were engaging in selling wild foods. The trade in wild foods can increase the child's capital gains which enhances their own or their household's ability to purchase or trade for



food. This has been recorded in other similar studies internationally (Neuman and Hirsch, 2000) and within South Africa (Shackleton and Shackleton, 2004a; Shackleton, 2005; Hunter *et al.*, 2007). Currently these wild foods are freely available and therefore require relatively minor investments but generate potentially large pay-offs (Reddy and Chakravarty, 1999; Cavendish, 2000). The major markets available to the children were traditional healers or local tourists. The commercialization of non-timber forest products (NTFP) has been identified as a strategy often adopted by households during times of adversity (Angelsen and Wunder, 2003, Shackleton and Shackleton, 2003). Paumgarten (2005) suggests that by utilizing natural resources everyday a household, or an individual child which is the case within this study, is able to save money by not spending it on food or other resources. This could very well be the case for the children in this study. So while there are potential direct cash-inputs into the household or individuals assets, there is also the potential saving of cash, when the food is not sold, but instead used by the child or household.

#### *2.5.4. Wild food collection strategies*

Wild food collection was found to occur mainly in groups, with children using a variety of instruments and techniques. What is interesting is that children in the inland site of Mabeheha were observed collecting shellfish, despite the coastline being about 15 km away. Afflicted non-school children consumed a significantly higher amount of coastal resources than non-afflicted children. This indicates the value these coastal resources have to these vulnerable children, if they were would complete a 30 km round trip, just to get shellfish and fish. Most children admitted to hunting wild foods because they enjoyed the taste of the food and they enjoyed the process of hunting and collecting. Children also stated that they also consumed wild foods because they needed to supplement their poor domestic diets, i.e. they hunted because they were hungry. While within the results responses given by the children for hunting and collecting wild foods are ranked according to their popularity, I argue that a universal reason for why children consume wild food is non-existent, as the process of hunting and collecting wild food requires examination within the context of each child's circumstances. There could be a multitude of reasons which influence a child's decision to hunt or collect wild foods. While I have placed a specific scrutiny on the impact of HIV/AIDS on children's use of wild foods, I argue that a child's motivation to choose to hunt or collect wild foods remains the mystery of each individual child. Keller *et al.* (2006) found that amongst farmers in Tanzania, indigenous vegetables were harvested for many different reasons, these ranged from risk aversion to experimentation. Keller *et al.* (2006) found that access to knowledge was key determinant of what indigenous species were used by farmers. As we move closer to understanding the dynamics of wild

food use among rural children, we may be enlightened to the processes effecting children's decisions to hunt or collect wild foods.

From this initial survey, we can see that rural children of the Eastern Cape use several different techniques to hunt and harvest wild foods. Each of these techniques is specific to the resource being harvested or hunted, and that often these activities require various levels of social organization and technical and ecological knowledge. A hunting party is often an organized social event, as are shellfish harvesting groups. The initial survey only identifies the different techniques and activities required for wild food use, and do not examine the dynamics of these groups. Therefore there is a need for a more fastidious investigation into the social and cultural dynamics that mobilize and direct these groups. It would also be useful to investigate how the knowledge systems surrounding these activities develop and how they are passed on, as the children's current local knowledge seems to be very sophisticated.

#### *2.5.5. Children's perceptions of the health benefits of eating wild foods*

There is a widening body of knowledge that supports the validity of wild foods as valuable sources of nutrition. As reported in chapter one, wild fruits and nuts provide essential inputs of protein, vitamins and micronutrients. Leafy vegetables are key sources of micronutrients including vitamins A and C, iron and other nutrients (Schippers, 2000; Beisel, 2002; Kinyuy, 2001; Piwoz and Preble, 2002; Semba and Tang, 1999). For example, a portion of *Amaranthus spp*, commonly utilised throughout Africa as a green leafy vegetable, typically has 200 times as much vitamin A as the same size portion of cabbage and more than 10 times the amount of iron. In sum, *Amaranthus spp* provide about 4500 units of vitamins per 100 g edible portion, compared to the 600 g of Swiss chard and 280 g of cabbage needed to compile the same units of vitamins (Schippers, 2000). Wild leafy vegetables are also typically very rich in carotenoids. For example, *Amaranthus spp*, *Chenopodium album* and *Bidens pilosa* have at least 200 times more carotenoids than cabbage (Kruger *et al.*, 2005). Carotenoids, along with vitamin A, have been shown to play a vital role in both reducing infection risk as well as slowing the progression of HIV into AIDS (Mehendale *et al.*, 2001; Melikian *et al.*, 2001; Beisel, 2002). It is not just wild plants that provide valuable nutrition to vulnerable people, wild animals provide much needed protein to rural people all across Africa (Grivetti, 1975; Panayotou and Ashton 1992; De Foliart, 1999; Bennett and Robinson, 2000; Bhat and Rubuluza, 2000; Bennett, 2002; Loibooki *et al.*, 2002; Jerozolinski and Peres, 2003; de Marode *et al.*, 2004; Fa *et al.*, 2005). Even insects provide valuable protein to vulnerable peoples in Africa; in central Africa insects have

accounted for 10 % of the animal proteins consumed annually (De Foliart, 1999) and insects have been widely consumed among rural people in the Democratic Republic of Congo, Angola, Congo Republic, Malawi, Zambia, and South Africa (De Foliart, 1999). The caterpillar *Imbrasia belina*, commonly known as the mopane worm, is collected, consumed and even marketed in South Africa, Botswana and Zimbabwe (Greyling and Potgieter, 2004). This caterpillar is a valuable source of protein and 100 g of dried mopane contains 76 % of an average human adult's daily protein requirements (Greyling and Potgieter, 2004) and 100 % of the daily requirements of many vital minerals and vitamins (Bartlett, 1996). Van der Waal (2004) identified the collection and consumption of 42 different species of grasshopper for food by the Tshvenda people in Limpopo province, South Africa. Children were the primary harvesters as well as old women. Some children walk up to 6 km to reach productive grasshopper territory. The children were also observed creating innovative tools to catch grasshoppers. In Limpopo province, insects are particularly useful to children, being regarded as *children's foods* and being subject to higher utility in the context of heightened HIV/AIDS food insecurity (Hunter and Twine, 2005). Insects, unlike large animal sourced protein, are more accessible to small children, both culturally (i.e. considered acceptable food sources for children) and practically (i.e. requiring lower inputs in terms of hunting skill and hunting materials) this could be the reason why they have become known as children's foods.

While we know that wild foods are often nutritionally superior to domestic or cultivated foods, just over half the children in the coastal and inland children felt that these foods were not healthy. From the discussions between the children and myself that developed from the initial survey, it could be seen that there were outside cultural influences governing children's perceptions of the health value of wild foods. De Foliart (1999) highlights several studies that mention the effect western aversions to eating insects have had on inhibiting insect consumption among rural people in Africa, without providing any substitutes to the loss of nutrition the insects previously provided. Frison *et al.* (2005) argues that modern agricultural and nutritional sciences have neglected the role of indigenous and uncultivated plants in the diets of rural and peri-urban people. While we now begin to recognise the value of wild foods in vulnerable rural children's diets in Africa, the obvious next step would be to consider the cultural influences in children's access to certain wild foods. As food security begins to weaken due to the impacts of HIV/AIDS (Enwonwu and Warren, 2001; Gillespie *et al.*, 2001; Haddard and Gillespie, 2001; FAO, 2002; Piwoz and Preble, 2002; Save the children UK and Oxfam, 2002; de Waal ad Tumshabe, 2003; SADC FANR VAC, 2003, Gari, 2004) vulnerable people cannot afford to have their food resource base reduced any further by cultural prohibitions or food taboos. While this is an

obvious concern, Grittlesohn and Vastine (2003) state that the current evidence regarding the effect of food prohibitions on actual diet and nutritional status is limited, and they cite two studies where there was no impact found on children's nutritional status from food taboos or food prohibitions.

Among the children surveyed in this study, there were generally misconceptions surrounding what makes food healthy. Many children admitted that food that makes you feel full is healthier than 'lighter' foods. Therefore, foods like wild spinaches, wild fruit and shellfish were not considered as healthy as something like bread or maize meal. A useful intervention would be raising awareness among rural children and adults alike regarding the nutritional and health benefits gained from eating commonly available wild foods, as well as the adverse impacts of having a regularly homogeneous diet. While wild food consumption may provide health benefits for vulnerable children, we must also consider some of the health costs associated with wild food consumption. Hunting may prove dangerous, if children get attacked or cause injury to themselves when trying to capture or kill the animal. In some circumstances children ate wild food raw, this could potentially expose them to possible parasite infection. Finally there is the danger that children might miss identify a wild food, and be poisoned by it.

## ***2.6. Conclusions***

The methodology utilised in this study proved useful for the scale of this survey, as it needed to be a rapid and efficient investigation that could assess the lives of a large proportion of rural Eastern Cape children. This being said, the IDDS scores were not necessarily the most refined measurement in determining the specific influences of HIV/AIDS on children's wild food use. The direct question "do you eat any of the following animals?" or "did you eat this particular animal yesterday" was a far more telling measurement of the impact of HIV/AIDS on wild food use, than the IDDS scores.

From this preliminary investigation into the diets of rural children made vulnerable by HIV/AIDS in the Eastern Cape, it is clear that children are certainly using wild food to supplement their diets. There is also evidence to suggest that children more vulnerable to the impacts of HIV/AIDS utilise wild foods more than less vulnerable children. This information must be acknowledged by the development community and children in rural Africa must be highlighted as a group that is highly vulnerable to food insecurity. While we must recognise rural children as highly vulnerable to the impacts of HIV/AIDS we should not underestimate their ability to find strategies to cope with their compromised situations. A better understanding of child-based use of natural resources is therefore needed in order

to investigate whether we can consider children's reliance on wild foods as contributing significantly to children's diets, or if in fact it is just merely child's play. These results will be valuable in creating viable and appropriate food security and natural resource management interventions.

### *Chapter three:*

## *The impact of HIV/AIDS on vulnerable rural children's food security and coping strategies within Coffee Bay and Mabehana: children's perceptions of food consumption patterns*

*"I'm growing up in poverty, we are always looking for more food, and we often go to bed with an empty stomach. Both my parents are not working. My mother 'exchanges' herself in order to get food for us; because my father was not in front of my people's eyes (he is not well known)."*

Unathi, 12 year old girl, Coffee Bay

### **3.1. Introduction**

#### *3.1.1 Food security, rural livelihoods and HIV/AIDS in the Eastern Cape*

The rural Eastern Cape is one of the poorest areas of South Africa, due to its heritage as a former homeland under the previous apartheid government (Porter and Phillips-Howard, 1997; Nel and Davies, 1999; Bank, 2002). While the region is endowed with a rich and diverse natural resource base, there are areas which suffer from severe land degradation and weak agricultural systems (Nel and Davies, 1999; Hebinck and Lent, 2006). The combined and synergistic effects of poverty and weak agricultural systems set the potential for declining food security within the Eastern Cape. In addition to this are the presumed significant adverse impacts of HIV/AIDS on rural food security, as shown in other parts of the world, are becoming more noticeable (Enwonwu and Warren, 2001; Gillespie *et al.*, 2001; Haddard and Gillespie, 2001; FAO, 2002; Piwoz and Preble, 2002; Save the children UK and Oxfam, 2002; de Waal ad Tumshabe, 2003; SADC FANR VAC, 2003, Gari, 2004). Therefore, the future of rural people's regular access to food within the Eastern Cape (and other regions of Southern Africa) is of deep concern.

Food security was originally defined by the World Bank (1986) as: *"the access by all people at all times to enough food for an active, healthy life."* However, Gari (2003) provides a more detailed definition appropriate to the content of this chapter: *"Food security is the state in which all people have an autonomous and regular access to food in sufficient amounts, under safe conditions, with the adequate nutritional quality, and in due regard for their legitimate cultural values and food*

*preferences. In rural areas, local food security also entails sustainable agricultural and environmental means for food production as necessary factors for a genuine and enduring food security.”*

The current situation is untenable and food insecurity within southern Africa is becoming more prevalent (Drimie and Grandure, 2005). The HSRC (2004) claimed that over 35 % of South Africans are vulnerable to food insecurity. As such, rapid and meaningful investigation is required, which seeks to reveal the factors influencing household food insecurity in rural and urban southern Africa. One key factor is the prevalence of HIV/AIDS which is beginning to show impacts in all aspects of food security (HSRC, 2004). Yet our current understanding of its impacts is, as Gillespie *et al.* (2001) states, weak and mostly anecdotal and recycled.

The Eastern Cape is not alone in its vulnerability. Devereux and Maxwell (2001) provide evidence that sub-Saharan Africa has some of the highest populations of people facing chronic food insecurity as well as persistent threats of famine. So too is the region plagued by the highest HIV/AIDS prevalence in the world (UNAIDS/WHO, 2006). While we are beginning to understand that HIV/AIDS is affecting households as yet another shock event that jeopardizes household food security, Baylies (2002) claims that HIV/AIDS is a “*shock like no other*”, which its systematic impacts disrupt all aspects of rural livelihoods (Haddad and Gillespie, 2001; de Waal and Tumushabe, 2003; Drimie, 2004).

The increasing adverse effects of HIV/AIDS on social, economic and environmental systems eventually significantly impoverish these systems (de Waal and Tumushabe, 2003). The long term costs of selling or compromising valuable household assets and indebtedness to cope with current difficulties induced by HIV/AIDS are often not considered (de Waal and Tumushabe, 2003). With the weakening of household investments through the various impacts of HIV/AIDS and thus a reduction of necessary household assets, family members find it more difficult to meet their daily basic livelihood requirements. The afflicted households weaken even further, through the demoralizing and disempowering psychological effects felt by household members witnessing the illness and death of loved ones as well as observing the erosion of assets and livelihoods within their home (Rugalema, 2000; Baylies, 2002; Beisel, 2002; de Waal and Tumushabe, 2003; de Waal and Whiteside, 2003; Drimie, 2004). Productivity is reduced, with the loss of key skilled individuals and with them is lost valuable knowledge, thus breaking down the transfer of knowledge between user groups and generations (Mutangadura *et al.*, 1999; IFAD, 2001; de Waal and Tumushabe, 2003; Harvey, 2003;

Drimie, 2004). Woman and children are the most vulnerable demographic, and are left to adopt old or develop new responses to cope with these severe changes (Save the children UK and Oxfam, 2002).

Rugalema (2000) suggest that the impact of HIV/AIDS is unique to other shock events, in that it afflicts the household so broadly that it cannot “cope”, i.e. it is unable to maintain an acceptable livelihood and instead “struggles” until the household weakens to the point that it dissipates (Rugalema 2000). Therefore, within the context of HIV/AIDS, households have a variety of responses to the loss of skills, reduction in labour and diminished food quality and quantity. These range from reducing meal portions to relocating household members to extended families; often these members are children (de Waal and Tumushabe, 2003).

While we are beginning to understand some of the complexities HIV/AIDS is playing in weakening rural households and livelihoods, there are more present and short-term demands placed on individuals as food becomes more difficult to access. The most significant of these is reduced nutrition, in the form of micronutrient (iron, zinc and vitamins) and protein-energy deficiencies (Barnett and Whiteside, 2002). HIV/AIDS places heavy demands on the micro and macro nutritional requirements of infected individuals. Improved nutrition decreases the risk of primary infection and prevents secondary infection (Friss, 1998; Gillespie *et al.*, 2001; Vorster *et al.*, 2004), and afflicted individuals have an increase in protein requirements of up to 50 %, as well as a 15 % increase in energy requirements (Friss, 1998; Piwoz and Preble, 2002). Barnett and Whiteside (2002) argue that in much of the HIV/AIDS interventions within rural areas, the value of nutrition has been overlooked.

Despite this dire picture, rural livelihoods are resilient, and diversification is often evident as a strategy for decreasing risk and coping with hardship (Bryceson, 2002; Campbell *et al.*, 2002). Typically they engage in arable agriculture, migrant labour, remittances, livestock husbandry and the collection of wild resources. The latter is potentially of increased importance in AIDS-effected households. It is well appreciated that surrounding ecosystems provide a variety of natural products for local people, including fuel wood, medicines, timber, and importantly, a source of nutritious food (Barany, 2003, Frison *et al.*, 2005; Shackleton and Shackleton, 2004a; 2006). A diverse body of literature has highlighted the wide utility of wild foods from natural areas, including fruits, herbs, honey, mushrooms, fish, birds, small mammals, reptiles and insects which may be important in jeopardised food security (High and Shackleton 2000; FAO, 2002; Manika and Trivedi, 2002; de Merode *et al.*, 2004; Lowassa *et al.*, 2004; Swallow *et al.*, 2004; Takasaki *et al.*, 2004; Barany *et al.*,



2005).

de Waal and Tumushabe (2003) suggest that households are no longer able to cope with the weakening of their livelihoods and thus food security and instead are struggling with short-term solutions that often jeopardise long term support structures. Within this chapter I suggest the possibility that people are able to cope with these difficulties, particularly if the focus is shifted from the household to the individual. Households as organisms are certainly not coping with the variety of pressures placed on them in the context of HIV/AIDS; however the autonomous activities adopted by individual members of the household could possibly be considered a coping response as apposed to struggling. Chapter two has introduced the role of natural resources use among children independent to their households and the increased reliance children vulnerable to HIV/AIDS have on such systems. It is therefore appropriate to support the SADC FANR VAC (2003) statement which stresses the need to investigate the causes and effects of HIV/AIDS on rural livelihoods, and more specifically rural people's food security, in the context specific to a unique social group or area. As such, this chapter investigates the relationship HIV/AIDS has with the food security and coping strategies of vulnerable rural children within the Eastern Cape of South Africa; and considers the importance of their reliance on local natural environments, compared to other responses to food insecurity.

### *3.1.2. Rationale and key questions*

In order to create a holistic picture of the effect HIV/AIDS is having on rural children's relationship with biodiversity, it will be necessary to understand what effect the impact of HIV/AIDS is having on rural children's food security, as well as the types of coping strategies vulnerable rural children adopt to deal with reduced food security. Therefore, the key questions that are addressed in this chapter are as follows:

- Is there a noticeable impact of HIV/AIDS vulnerability on rural children's access to food?
- Is there a noticeable impact of HIV/AIDS vulnerability on rural children's eating dynamics within their household?
- What are the main coping strategies adopted by children vulnerable to the impact of HIV/AIDS, with regards to access to food?
- Does the impact of HIV/AIDS vulnerability affect individual children's perceptions of their own diet with respect to quality and quantity?

### *3.2. Study sites (Coffee Bay and Mabehana)*

The study sites were selected using information gathered in earlier research (see chapter two) through a broad study conducted in six sites, three coastal and three inland. The coastal site of Coffee Bay (31° 58' 0" S, 29° 9' 0" E) and the inland site of Mabehana ( 31° 54' 0"S, 29° 4' 0"E ) were selected as areas where further detail would be obtained, as baseline data on the impact of HIV/AIDS, dietary diversity and food nutrition per child had been previously collected.

The area is characterized by rolling hills which run parallel to the rivers into the sea. They are covered in grassland, with forest occurring within the valleys between the hills. The rivers carve valleys through these hills, providing moist alluvial soils along the drainage lines, which provide perfect conditions for forest growth (Palmer *et al.*, 2002). Settlements are situated on the higher hill ridges. Cultivated fields occur near the villages and are usually adjacent to a homestead. The temperature is moderate with a maximum of 21.5 °C rising to 24 °C in summer between October and March (Cawe, 1994). Winter months are cool and dry. Rain occurs mainly in the summer months between October and April. Mean annual is 1 069 mm per annum regional average rainfall is 815 mm per annum (Palmer *et al.*, 2002). The vegetation is dominated by Eastern Thorn Bushveld (Low and Rebello, 1996) which consists of small shrubs and grasslands with numerous and extensive patches of forest, lying between the rolling hills (Acocks, 1988) and falls under the Tongoland-Pondoland Regional mosaic, which is a species-rich area. Fire and grazing are the key determinants of this vegetation type, but soil and climate are also important factors. The grassland is characterized by tall herbs, shrubs and tall, coarse grasses; this heterogeneity shows the strong successional movements towards forests (Low and Rebello, 1996).

The two sites fall in the Oliver Tambo District Municipality, of the Eastern Cape province of South Africa (Figure 2.1). The sites formed part of the former Transkei Bantu homeland created by the apartheid government's Group Areas Act (Bank, 2002). The people living in these villages are, for the most part, *amaXhosa*, with the local language being *isiXhosa*. Historically this area was inhabited by two *amaXhosa* clans, the *Bomvu* and *Abalungu*. Due to their history of exclusion and the migrant labour system, today people in both the sites experience high levels of rural poverty. The majority of households rely on government grants and remittances from urban family members (Leibbrandt *et al.*, 2000; Posel, 2001; Spiegel *et al.*, 1996). It is not uncommon to have a whole family surviving on a single pension.

Within both sites the landscape itself contains a wealth of natural resources and valuable biophysical assets. The more inland site of Mabehana lies on the road to Coffee Bay running from the N2 main

road between the towns of Dutwya and Mthatha. Mabehana lies approximately 15 km inland from Coffee Bay. It is situated high above the Mthatha River, on the southeast slopes of the river. The Mabehana study site runs from the Coffee Bay road down into the river valley. The landscape is characterized by grassy rolling hills, with deep gorges containing lush forests. Households are scattered across this region; however the majority of the households are found along the dirt road, which runs from the tarred Coffee Bay road down to the Mthatha River. There are three schools, and the closest clinic is approximately 5 km northwards along the Coffee Bay road. Coffee Bay is found on the coast, and the study area is larger than the Mabehana study site. Coffee Bay is a popular tourist attraction, boasting spectacular scenery defined by a rugged coastline, rolling grassy hills and lush coastal forests filling the valleys. Coffee Bay contains a more gentle topography than Mabehana. The study was conducted in six administrative 'villages' within the Coffee Bay site (the households, as with Mabehana, are scattered; they do not look like villages). There are six schools, a clinic, four hotels, three backpacker lodges, and holiday cottages intermingled between the villages along the coast. There are more job opportunities in Coffee Bay than Mabehana; it is not uncommon for some people from Mabehana to temporarily move to Coffee Bay in search of work. However, within both sites the main form of income is through government grants and remittances from urban family members (Leibbrandt *et al.*, 2000; Posel, 2001; Spiegel *et al.*, 1996).

### ***3.3. Methodology (Follow-up Surveys)***

After the collection of data from the three coastal and three inland sites (chapter two), using the school and non-school worksheets, a single coastal and inland site was selected to collect further information, through guided interviews and interactive diaries (chapter four). Using information from the previous school surveys, 30 Highly Vulnerable (HV) and 30 Least Vulnerable (LV) children were selected and re-interviewed within each site. HV children included those children who answered affirmatively to four or more of the proxy indicators for HIV/AIDS impact within the household, while LV children included those children who did not have any of the proxy indicators. Therefore, a total of 120 children were interviewed. These children included school-going and non-school-going children. The interview began with my translator and I reintroducing ourselves and reiterating what our study was about (as we had met and worked with these children a few months earlier). We then requested permission from the child and guardian/parent/teacher to continue with the session. All the possible known pros and cons of being involved in the study were expressed to the child and the respective adult responsible for the child. After verbal permission was granted, we began by talking informally about the child's diet, and likes and dislikes. The formal guided interview followed a four

page questionnaire, which collected similar information as the school-surveys (i.e. proxies for the impact of HIV/AIDS as well as individual dietary diversity indices). The questionnaire's main focus was to add more detail to the questions asked in the previous school-based survey (see appendix B for the full survey). Therefore, sections included:

- Details on the child's household resources (e.g. livestock, presence of a garden or field, access to water, energy sources, etc.)
- Food security issues (e.g. frequency of food intake, frequency of periods of hunger, etc.)
- Coping strategies adopted by the child to accommodate lack of food, if and when experienced.

After the completion of the interview, food and activity diaries were presented to the children (appendix C). These diaries were used to quantify a child's individual dietary diversity, as well as activities they were engaging with, over a two week period (for more information of these diaries see chapter four). At the back of these diaries, the children were left three lined pages to write a story. There were no requirements placed on the content, length or quality of the story, it was carefully explained to each child that the story-telling section was there to allow them to communicate to me openly. If they had anything they wanted to tell me, that they felt was important to them, this section of the book would provide such a forum. The diaries allowed the children to communicate with me in a more open and receptive forum that was fun, educational, and comfortable enough to allow the children to express their own personal stories. The stories from the dairies proved very informative, and many of the themes dealt with the children's personal experiences with hunger and access to food. Within this chapter, these stories are presented with the quantitative results to provide a more holistic description of the children's food security and coping strategies. All interviews were supervised by my presence, I used the help of translators and facilitators to ensure that there were no misunderstandings in the translation.

Data collected from these interviews were collated with Open Office Calc. A Chi squared test was used to test significances for all the categorical questions. Children's written stories from the food diaries were translated from *isiXhosa* into English, and then cross-analyzed using coding and word searches. I assume that the children partook in the interviews honestly, and provided correct information. I also assume that the children recalled their diets accurately and did not forget to mention any foods they had eaten.

### **3.4. Results**

#### *3.4.1 The impact of HIV/AIDS on household assets and dynamics*

Within Coffee Bay, there was a significantly higher proportion of HV children (difference of 27 %;  $p < 0.001$ ) than LV children that did not have access to a garden or field to grow vegetables (Table 3.1). However, within the inland site of Mabehana there was only a three percent insignificant difference between HV and LV children's access to gardens or fields (Table 3.1).

As with access to a garden, there was a significantly higher proportion of LV children (difference of 14 %;  $p < 0.05$ ) in Coffee Bay whose households owned livestock and poultry than HV children (Table 3.1). Again, within Mabehana there was a negligible difference (2 %) between HV and LV children that lived in households that owned livestock (Table 3.1).

Vulnerable children in Coffee Bay had reduced access to water within the household. Access to rain tanks was significantly higher ( $p < 0.05$ ) for LV children in Coffee Bay. Within the inland site, there were no homes that had running water within the home; there was one LV child within Coffee Bay who had running water within their home. Within Coffee Bay, there was a higher proportion of HV households (difference of 21%;  $p < 0.05$ ) that had access to community taps than LV children, whereas within the inland site, access to water through community taps, rainwater tanks and river collection were evenly dispersed. Within Coffee Bay, there was a higher proportion (difference of 14 %;  $p < 0.05$ ) of LV children collecting water from the rivers and streams near their homes.

Within Coffee Bay, food access within the household showed some interesting trends with regards to the impact of HIV/AIDS vulnerability. The children were asked where the food they ate yesterday had come from. As expected, a significantly higher proportion of LV children ( $p < 0.001$ ) had consumed purchased foods (Table 3.1). A significantly higher proportion of HV children had eaten food that was either home-grown ( $p < 0.05$ ) or donated by a neighbor or relative ( $p < 0.001$ ). There was a negligible difference between HV and LV children consuming wild foods in the last 24 hours. Within Mabehana, there were no significant trends with regards to source of food (Table 3.1).

Table 3.1. Children's access to household assets in Coffee Bay and Mabehana (Chi-squared test)

	Low Vulnerability		High Vulnerability		p value		Chi-squared	
	Coffee Bay n=29	Mabehana n=30	Coffee Bay n=27	Mabehana n=31	Coffee Bay	Mabehana	Coffee Bay	Mabehana
Access to food garden (%)	83	87	56	90	< 0.001	0.506	0.000	0.329
Access to livestock (%)	43	41	29	45	< 0.05	0.567	0.0276	0.334
Access to purchased foods (%)	96	86	70	84	< 0.001	1	0.000	1

A question was posed to the children “who in the family eats first at meal time?”, the option of “grandmother/grandfather”; “father/mother” or “children” was provided. The impact of HIV/AIDS seems to shift the dynamic of food consumption between children and adults. Within Coffee Bay, a significantly higher proportion of LV children (difference of 32 %;  $p < 0.001$ ) stated that during meal time their grandfathers ate first (Table 3.2). A significantly higher proportion of HV children (difference of 33 %;  $p = 0.001$ ) stated that children ate first when meals were dished up (Table 3.2). Similar trends were observed at Mabehana, with a significantly higher proportion of LV children (difference of 86 %;  $p < 0.001$ ) stated that their fathers ate first and a significantly higher proportion of HV children (difference of 86 %;  $p < 0.001$ ) stated that children ate first (Table 3.2).

Table 3.2. Eating dynamics within the household at Coffee Bay and Mabehana (Chi-squared test)

	Low Vulnerability		High Vulnerability		p value		Chi-squared	
	Coffee Bay n=29	Mabehana n=30	Coffee Bay n=27	Mabehana n=31	Coffee Bay	Mabehana	Coffee Bay	Mabehana
Adults eat first (%)	58	100	26	14	< 0.001	< 0.001	0.002	0.001
Children eat first (%)	36	sample to low	69	86	< 0.001	< 0.001	0.000	0.000
Eat at the same time (%)	5	sample to low	5	0	1	1	1	1

#### 3.4.2. The impact of HIV/AIDS on rural children's coping strategies to avoid hunger

There were a total of four different coping strategies highlighted by the children in the survey, namely borrowing food from neighbors and relatives, collecting and eating wild food, stealing, and drinking water to feel as if you have eaten. Within both sites, the most commonly reported strategy adopted by children to cope with hunger was to borrow food from a neighbor or relative (Table 3.3). Within Coffee Bay the majority of LV (48 %) and HV (63 %) children cited borrowing food as their main strategy to cope with their hunger during difficult times, with a significantly higher proportion of HV children ( $p < 0.05$ ) borrowing food as a coping strategy, than LV children (Table 3.3). Similarly at

Mabehana, both LV (87 %) and HV (97 %) children borrowed food as their main coping strategy; with a significantly higher proportion of HV children ( $p < 0.01$ ) were borrowing food, than LV children (Table 3.3). Within both sites the second most popular coping strategy was to collect or hunt wild foods. Coffee Bay had 41 % of LV and 45 % of HV children stating that collection and hunting of wild foods was their main coping strategy; negligible difference between HV and LV children (Table 3.3). Mabehana had 7 % of LV children and 3 % of HV children, a relatively smaller number of children using wild foods as a safety-net to cope with hunger than Coffee Bay. One child admitted that he stole food from gardens and homes as a coping strategy (Table 3.3).

Table 3.3. Coping strategies adopted by the children at Coffee Bay and Mabehana (Chi-squared test)

	Low Vulnerability		High Vulnerability		p value		Chi-squared	
	Coffee Bay n=29	Mabehana n=30	Coffee Bay n=27	Mabehana n=31	Coffee Bay	Mabehana	Coffee Bay	Mabehana
Borrow food from relatives or neighbours (%)	48	87	63	97	<0.05	<0.001	0.023	0.008
Gather and eat wild foods (%)	31	7	30	3	0.877	0.194	0.500	0.1656

#### 3.4.3. The impact of HIV/AIDS on children's perceived diet quality and quantity

Within both sites, children often consumed a stiff maize porridge (*upokoqo*) as their only meal in a day, with no vegetable accompaniments, resulting in a meal with very poor nutritive properties. Many children stated that they ate plain *upokoqo* on a daily basis (Figure 3.1 a and 3.2. a). Within both the inland and coastal site, meat consumption (the meat category also including chicken and fish) was considered mainly a monthly occurrence for both the HV and LV children (Figure 3.1.b and 3.2.b). The monthly occurrence of meat consumption is most probably influenced by the monthly pension pay out system, whereby children's parents or guardians have cash to purchase meat. Overall, there are no statistically significant trends between the perceptions of how often HV and LV children eat certain foods. While both chapter two and four reveal that there are significant differences between the observed diets of HV and LV children.

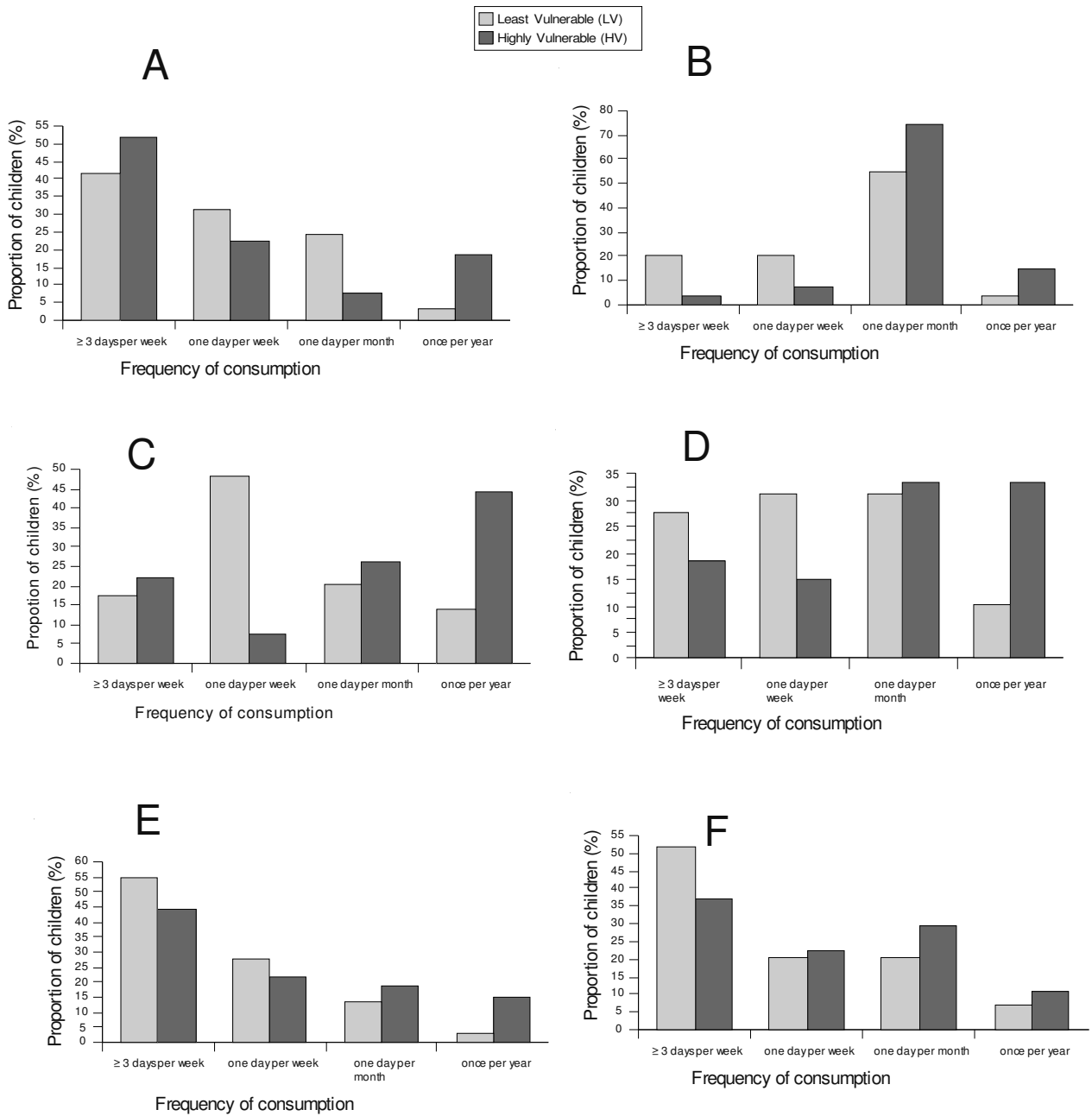


Figure 3.1: The relative food quantity of highly vulnerable and least vulnerable children in Coffee Bay. The frequency that children ate: A) maize meal; B) meat, chicken or fish; C) eggs; D) dairy; E) vegetables and F) fruit



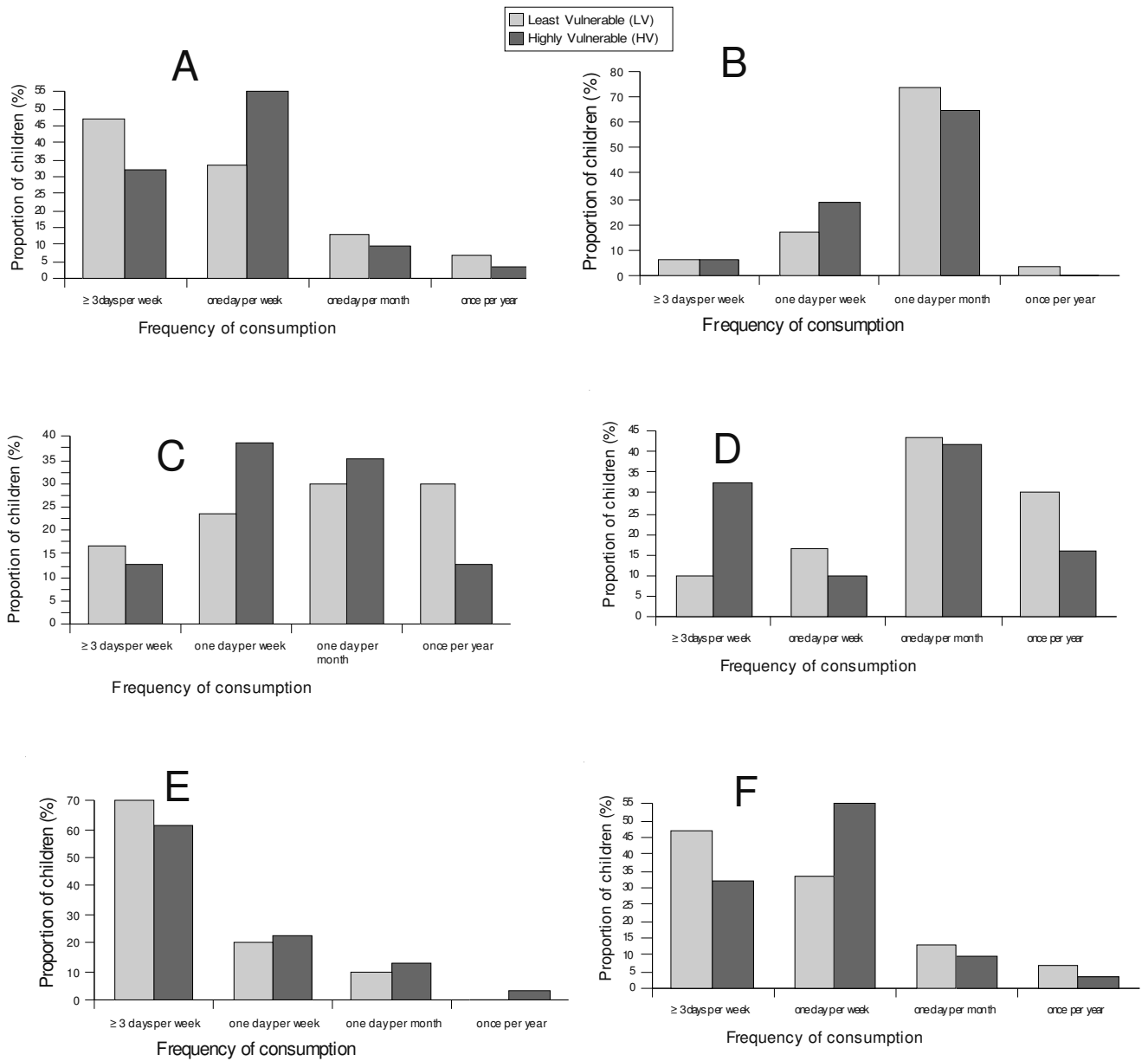


Figure 3.2: The relative food quantity of highly vulnerable and least vulnerable children in Mabehana. The frequency that children ate: A) maize meal; B) meat, chicken or fish; C) eggs; D) dairy; E) vegetables and F) fruit

### **3.5. Discussion**

#### *3.5.1 The impact of HIV/AIDS on household assets and dynamics*

De Waal and Whiteside (2003) consider HIV/AIDS a considerable new driver of famine in the rural areas of Africa. The virus has severe adverse impacts on rural people's food security (Enwonwu and Warren, 2001; Gillespie *et al.*, 2001; Haddad and Gillespie, 2001; FAO, 2002; Piwoz and Preble, 2002; Save the children UK and Oxfam, 2002; de Waal and Tumshabe, 2003; SADC FANR VAC, 2003; Gari, 2004). This is certainly the case in Coffee Bay and Mabehana, where many households were experiencing poor diet quality and quantity. The complex weakening of a household's capital base from the pressures of HIV/AIDS is difficult to quantify (Haddad and Gillespie, 2001; Baylies, 2002; de Waal and Tumshabe, 2003). However, children's lack of access to food gardens, purchased foods, livestock and water were recognised as proxy indicators for weak household assets within this study. There were significantly higher proportions of highly vulnerable children in Coffee Bay that did not have access to food gardens, livestock and poultry, purchased foods and rain tanks. At the inland site there were no statistically significant differences between HV and LV children when it came to access to household assets or amenities. What could be eroding household assets so significantly in Coffee Bay is unknown. Regardless, there does seem to be some relationship between the level of HIV/AIDS affliction within the household and reduced access to valuable resources such as food gardens, livestock, purchased food and water within the household. With the weakening of households and their reduced ability to support children, the children themselves are adopting new independent strategies to cope with the erosion of assets within their homes.

The follow-up surveys revealed some interesting impacts HIV/AIDS might be having on social dynamics within the household. Traditionally in Xhosa culture it is common for the elderly and adults to eat first within a household (Kaschula, 2007 b), however within the households with HV children, adults and the elderly ate after the children. What specific HIV/AIDS driver would cause such a cultural shift is unknown. What is interesting is the possibility that HIV/AIDS is raising the status and importance of children within Xhosa culture, or perhaps reducing the status and importance of the elderly. This needs to be investigated.

#### *3.5.2. The impact of HIV/AIDS on rural children's coping strategies to avoid hunger*

Reciprocity was the most commonly cited coping strategy for obtaining food among both the HV and LV children. As this 13 year old boy in Coffee Bay explains:

*"Some of the food I eat is provided by the neighbors, sometimes I share what I get with my little*

brother.”

It is well documented in the literature that reciprocity and extended family networks are the most relied upon coping strategy within southern African communities suffering from the impact of HIV/AIDS (Ankrah, 1993; Seeley, 1993; Ntozi, 1997; Tibaijuka, 1997; Waller, 1997; Donahue, 1998; Rugalema, 1999) and generally (Paumgarten, 2006).



Figure 3.3: A 7 year old boy eating *imifino* (wild spinach) collected by his older sister

Foster and Williamson (2000) describe extended families on which vulnerable rural children rely, as reciprocal obligations that can cover a wide geographic area. These networks reach through a variety of different relationships and include multiple generations (Foster and Williamson, 2000). How communities cope with caring and supporting orphaned children varies considerably. “Adoption” in the western sense is not typical to most African cultures (Foster and Williamson, 2000). Fostering by relatives is considered to be a reciprocal obligation (Aspaas, 1997), and fostering by non-relatives is not common (Caldwell, 1997). Often children slip between the cracks of traditional African fostering, and there is a great deal of pressure placed on extended families to cope with children

orphaned through HIV/AIDS. Giese *et al.* (2003) state that children often have a “sequence of different caregivers” and that many children are often raised without parental figures within households different to their biological siblings. Budlender and Meintjies (2004) found that out of the 15 million children under 18 whose parents were recorded alive, only 45 % were living with both parents at the time of their survey, while 17 % were living with neither of their parents. There is also a common misconception that most children orphaned through HIV/AIDS are left to manage households on their own, however several studies have found that child-headed households are rare (Ainsworth, *et al.*, 1995; Gilborn, *et al.*, 2001; Budlender and Meintjies, 2004) and that child-headed households were often a temporary or transitional arrangement (Giese *et al.*, 2003; Lund, 2003). Drew *et al.* (1998) suggests that the most valuable interventions are those that seek to strengthen family and community capacities to take care of vulnerable children.

Even though reciprocal relationships are a valuable strategy to acquire food during difficult times, and

most often the first option available to children in crisis (Foster, 2004) there were several children who had stories that involved being turned away, or treated harshly by their neighbors when seeking food. A story written by “Lindy” (17-year old girl from Mabehana) powerfully and eloquently revealed the difficulties her family faced when relying on neighbors for food. Her story is entitled *Ukukunaywa yinkawu* (Kicked by a monkey):

*“If you don't know how to be kicked by a monkey, you know nothing. Sometimes I ask myself, why God created me. When you look at your neighbor's house, and you see smoke rising from it, you go to visit, because you are hungry. I will never forget the year when my mother went to the neighbors and the neighbors were not there, only the children. My mother persuaded the children to give her maize-meal, and they gave her some. She came back and started to cook, while she was preparing the dish, the neighbors returned and arrived at our house in anger, they took the pot and dished the food and gave it to the dogs outside. That was the time when we were dying of hunger. My mother did not say any words, and we said to her it was okay to be quiet. We decided to eat the leftovers, to try stop the hunger. Later we ran to the fields to collect wild vegetables. We picked a vegetable called nkwambe, because the fields were full of them. We went home and cooked them and kept them for the next day.”*

It seems that these reciprocal networks do not always provide the kind of long term support (Moser, 1998; Rakodi, 1999) that they are attributed within the literature (Ankrah, 1993; Seeley, 1993; Ntozi, 1997; Tibaijuka, 1997; Waller, 1997; Donahue, 1998; Rugalema, 1999). There is inevitably a gradual weakening of reciprocity between households where some households are unable to pay back into the reciprocal arrangements due to the erosion of assets and livelihoods through the impact of HIV/AIDS (Moser, 1998; Rakodi, 1999). Considering this increasingly compromised option of relying on extended families and neighbors for food, it is possible that children will begin to rely more heavily on wild foods as a source of diet supplementation. Indeed, wild food consumption was the second most popular coping strategy adopted by vulnerable children in Coffee Bay and Mabehana. Lindy's story continues, revealing the constant support wild foods have for children coping with eroding extended networks.

*“To be kicked by a monkey (to starve of hunger) is bad; it makes you decide to look for wild vegetables to eat. I like to look for wild vegetables to eat; I look for them in the forest and fields, so that I can have something to eat before I got to bed. My home is poor, and that is why I look for wild vegetables. I used to be lazy, and did not go to the forest or fields. I learned my lesson when we slept without food, even without maize or vegetables. There was nothing in the fields, and we went hungry...*

*Hunger is a coward. Now I know that there is food that I do not need to buy. If you have wild*

*vegetables and maize, that is something you can eat to go to sleep. If you don't know poverty, you don't know anything, I grew up suffering, and even now I'm still suffering. If I look at other families, I need to cry. I ask myself how can I be and look like them. The time my mother applied for a child grant for her two children, it helped us, we were still suffering, but now we all depend on this grant. We go to school with hunger and we are hungry at school, we cannot concentrate while our teacher teaches us. There are two things that stop suffering, I say thanks to my protectors, like maize and vegetables.”*

Siphokazi, an 18 years old girl at Mabehana, experienced a similar situation, with reciprocal network pushing her away:

*“I was hungry and without hope, I didn't know how I was going to get food. I went to the forest to get wild fruit. That day was difficult, I decided to visit another family to ask for some food, but they chased me away with their dogs. Not having money is painful, some days I go the whole day without eating. And I have no hope to get more food. Sometimes I just go to the forest to collect wild food. I went to a family to get sugar, but the mother of the family and their children just shouted at me. They said that I ask for food from them too much. I told them that they can't laugh at someone with a problem, what will happen to them when one day they have a problem. I know the only way to fix a problem is to have hope.”*

Neliswa an 18 year old girl from Mabehana, has also experienced neighbours giving up on supporting her and her family:

*“My story is painful, sometimes I attend school without food. Even when I am at school, I have no way of getting food. I only eat when i go back home. If we have money we could eat something that is good for the blood. We live a hard life. We go to bed with only water, we finish all our food stocks before the end of the month, and now I neighbours will not give us food. I think they are tired of having us ask for food. I could write the whole day, but my heart is painful, because I tell you the truth.”*

A 13 year old boy from Coffee Bay, had this to say about reciprocity in his life:

*"Some of the food I eat is provided by the neighbours, sometimes I share what I get with my little brother. The woman looking after me when I go to school in Mpunzi relies only on the fields for food. She grows things like potato, imifino, maize, beans. She is trying to register me for a child grant, because I do not have parents. I am now living with my sister, but it is the same as living alone, its difficult living with my sister because she is sick, she could die anytime.*

*The hungriest time in my life is when I didn't eat the whole day, from the morning till late. I didn't eat a whole meal for seven days. I began to lose energy and hope. My brother was going to help me, but then he disappeared. My father came back from Joburg, he was sick, he could not feed me either. My grandmother bought me food now and then with her pension. I was suffering but then the sea began to help me. Now if I want food I go fishing and even I can sell the fish for clothes. I like fruit from the forests, if I need energy I go eat the fruit in the forest."*

Nkomo, a 21 year old young man, in Mabehana, spoke of how they rely on other families for school fees, not most other things in their lives:

*"I do not have good health. We are suffering at home, my father died and we only have our mother looking after us. She does not have a pension. We depend on other families for everything. Even to attend school. I don't want to talk anymore because my life is painful."*

The weakening of reciprocal networks due to HIV/AIDS has been documented, with the depletion of household's assets due to from the impact of AIDS; the household is less able to contribute to mutual assistance (Moser, 1998; Rakodi, 1999). However, wild food collection among vulnerable children as a coping strategy (as opposed to standard use) is a viable and reliable strategy for vulnerable rural children to increase the quality and quantity of their diets. Hunter *et al.* (2007) suggests that reliance on food from the bush is not necessarily a short term coping strategy, but lasts several years after the death of a breadwinner. Therefore, reliance on biodiversity by vulnerable children has the potential to support their physical, mental and emotional development, over longer periods of time, than many other responses to hunger that they adopt. This is significant as many responses available to these children are short term and jeopardize the future resilience of their livelihoods.

The benefits from wild food collection were not merely nutritional. Within Coffee Bay children were able to generate income from selling fish and shellfish to people within their villages and to tourists in the region, thereby increasing the benefits they received from wild food collection. As this sixteen year old boy from Coffee Bay wrote:

*"I do not have a mother, she passed away in 2003, my grandmother passed away in 2005. My father lived in Johannesburg and was working there, but he never sent us money, even when my mother was sick. Now my father is sick, he is not working and there is very little money. He now comes fishing with us to get food; we also collect mussels and crayfish. We sell the fish, mussels and crayfish to*

*people around us to get money for food. We are a poor family, to get food we mostly fish, hunt and collect fruits. If I want to buy something, I go straight to the sea, and get crayfish and sell it for money..."*

Hunter *et al.* (2007) found similar examples where wild foods not only provided critical inputs in food provision but also in income generation. Although the coastal resources are clearly valuable resources to vulnerable rural children, I was told by several children that they felt scared to collect these resources for fear of being caught by the coastal monitors. As this highly vulnerable 13 year old boy testified:

*"I used to be able to use the crayfish to help me whenever I wanted, but now they ask for a permit, I don't have a permit, I really want a permit. I do not have enough money to buy one."*

Understandably only one child admitted to stealing food from local people's gardens and homes; the fear of being caught or judged most probably reduced children's confidence in confessing to stealing food as a coping strategy within the survey. Ntombi (not her real name), 18 year old girl, Mabehana:

*"I'm one of the people collecting vegetables. Sometimes I try all different kinds of ways to get food. Long ago, we were very poor, and there was nothing to eat. I went to another family's garden, and stole some vegetables. My father died, my mother used to work as a domestic worker, but now she has no job. When my mother was working, I had to stay with another family. When my mother was away, our home was all locked up and I would look at it from the other family's house. It made me sad. But now my mother's back home. She decided to collect fuelwood and sell it to the people in the village, to get money for food. My mother has applied for a pension grant; we waited a long time before we could get money from pension. There are little children in our home, and it's good that we have some money now, but still the pension money is not enough. "*

There is one incident however, that illustrates the desperate situation some children are placed in within rural areas of the Eastern Cape. On returning from my first visit to Coffee Bay, I was searching for the children who did not go to school that I had interviewed with the introductory worksheet a few months earlier. There was an orphaned 16 year old boy, who lived with his sister. On my return I discovered that his sister had moved away and he had received little help or support from his community (incidentally it was admitted by a few community members that his deceased parents were not well liked within the village, therefore reducing the reciprocal support available to this boy). Out

of desperation one evening he broke into and robbed a local spaza shop. He was caught within the shop, by the owner, eating fried fish and drinking a carbonated drink. He was housed within the local jail awaiting his trial. Despite several efforts to try get him released (due to the fact that he was a minor) he remained within the system for six months. He was eventually tried as an adult, and released. His total time in jail was five months longer than his official sentence. It took two trips to the chief of police in Mthatha to receive permission to visit this boy while he was in prison. I eventually had a chance to speak with him and check if he was alright. We had a long discussion, and in it the most moving realization for me of his desperate situation was when he said, *“Its better here (in the jail), because here I get fed every day, and I have a place to sleep”*. Although children can rely on reciprocity and natural resources, these too in some instances can eventually fail. If a child finds themselves socially alienated their chances of accessing enough food are severely diminished.

The main coping strategies illustrated earlier (borrowing food and collecting and hunting wild foods) are perhaps viable strategies to supplement a poor diet. There is however some anecdotal evidence from the stories written by the children within their food diaries, of another less viable strategy children adopted during times of hunger to trick themselves into feeling as though they have eaten. Children claimed within their written accounts that they would drink water until they feel full, to cope with hunger pains. Below are excerpts from the food diary stories mentioning this strategy:

- Seventeen year old girl at Coffee Bay: *“I often go to bed with an empty stomach, and drink water to try full myself up. On these days I wake up early and cook imifino, and during the day I cook porridge”*
- Sixteen year old boy at Coffee Bay: *“There were times when I would drink water, because I did not have enough food, but I am grateful, when I am very hungry I eat imifino.”*
- Nineteen year old girl at Mabehana: *“I will never forget the day when I was so hungry that I decided to drink water to full myself up.”*
- Eighteen year old girl at Mabehana: *“We live a hard life. We go to bed with only water, we finish all our food stocks before the end of the month, and now our neighbours will not give us food.”*

### 3.5.3. The impact of HIV/AIDS on children's perceptions of their own diet quality and quantity

Children's perceptions of their diets showed no significant trends, but what they do reveal is the children's perceived quality of their diets. While there were significant differences between HV and LV children's observed diet (see chapter two and chapter four), their perceptions of their diet, as captured in the general survey, did not reveal these trends. The effects of HIV/AIDS on children's



perceptions of their diets remain hidden. In hindsight this question is noticeably flawed on several grounds. The first is that it didn't stipulate whether or not the food that they had eaten was sourced from their own households or from neighbors or relatives. Similarly this question would have been more indicative if it provided information on the size of servings, as frequency of consumption does not necessarily translate into how much food children were receiving at home.

#### *3.5.4. Considering the interface between natural resources and food security of rural communities*

Realizing the value of wild foods as a coping strategy for highly vulnerable children impacted by HIV/AIDS, we need to improve our understanding of the interface between natural resources and food security within rural communities, as these natural areas are central to the wellbeing of vulnerable rural children of the Eastern Cape, and are possibly the last remaining safety-net available to vulnerable rural people. These findings support Drimie and Grandure's (2005) argument which stresses the need to consider the wide range of complex and innovative strategies adopted by households and communities who are trying to survive the adverse effects of HIV/AIDS on food security, when developing external interventions. Creating interventions that do not consider this already versatile and widely used *wild-food-safety-net*, could possibly lead to development that undermines such valuable resources. For example, the development of a tourist camp within Coffee Bay forests may bring in jobs and economic change to the community but could also have an effect on wildlife within the forest, and the children's hunting activities.

#### *3.5.5. Counterpoint to the “struggling rural households” rhetoric*

The dynamics around wild food collection and consumption by children at Coffee Bay and Mabehana is shedding light on how natural resource use is a viable coping strategy for rural children living in households that are collapsing due to HIV/AIDS. In the HIV/AIDS and food security rhetoric summarized by de Waal and Tumishabe (2003), the resilience of coping strategies in the context of HIV/AIDS is reconsidered. Without the HIV/AIDS effect households suffering from drought or famine, which are both temporary shocks, are usually considered to have adequate resilience through social networks, use of natural resources and other strategies to eventually recover to a “socially accepted livelihood” (de Waal and Tumishabe, 2003: 3). However, rural households afflicted by HIV/AIDS are unable to cope with the shocks experienced, and instead struggle, moving deeper into poverty, with the household eventually dissolving entirely (Rugalema, 2000; Baylies, 2002). While the findings in this chapter support the fact that rural households are certainly dissolving from the erosion of valuable capital assets, (such as the reduced access to livestock, food gardens and purchased food

found in HV homes at Coffee Bay) the situation is not characterized by such a direct cause and effect relationship when coping strategies at the individual level are investigated. Instead HIV/AIDS has a diffused and nuanced impact on individual member's ability to cope. While many households are unable to cope and eventually collapse, children left behind do not necessarily collapse with it. There are specific instances where children's coping strategies in the face of HIV/AIDS do not follow the trajectory theorized by this general rhetoric.

It is accepted within the rhetoric that households affected by HIV/AIDS consume fewer meals of poorer quality, which in turn leads to less investments into the health of surviving family members (which are often children) (Rugalema, 2000; Baylies, 2002; Beisel, 2002; de Waal and Tumishabe, 2003; de Waal and Whiteside, 2003; Drimie, 2004). This argument is stressed most extremely by de Waal and Whiteside's (2003) hypothesis that HIV/AIDS is creating a "new variant famine". While the surviving family members of weakened households, particularly children, receive less support from the household, they are not necessarily left to starve with nothing to eat because of HIV/AIDS. Within the context of this study it was found that the independent input of wild food in children's diets has shown to increase their frequency of food consumption and dietary diversity, raising children's diet quality considerably, even when reciprocal support structures have broken down.

Secondly, it is generally agreed that people living in HIV/AIDS affected households are negatively effected psychologically (Mutangadura *et al.*, 1999; de Waal and Tumishabe, 2003; Drimie and Gandure, 2005). Depression and disempowerment increase within a household suffering from HIV/AIDS. Reduced mental wellbeing further demotivate family members, which severely exacerbates the already existent household labour shortages. These effects are undeniably prevalent and I observed them personally, nevertheless there are subtle support structures available to vulnerable children. Wild food collection appeared to boost children's morale, even those children living in difficult circumstances. While no data was collected on how many children hunted alone, compared to how many were hunting in groups, in all my observations I did not see children hunting or harvesting in isolation. The hunting parties, fishing groups and other peer-groups developed for collecting natural resources, were often cited as fun activities, that involved play and open communication. For example, from the general survey, 35 % of the children claimed the main reason for why they hunt is because they find it fun. It is clear to see the joy expressed by the children when swimming, hunting or fishing. Also there is something to be said about the empowering feeling that children experienced, when they realise they can increase the quality and quantity of their own diets without having to rely on adults.

Therefore, it can be seen that wild food consumption certainly provides psychological benefits to vulnerable children coping with HIV/AIDS within their households, thereby providing some counter to the negative effects of HIV/AIDS on family member's mental wellbeing. Children living in HIV/AIDS afflicted households are not necessarily isolated into progressively diminishing absence of psychological support. While their family members might fall ill and die or their parents reciprocal networks diminish, there are still the childrens' natural-resource-use-networks and peer groups to rely on which develop independent to their households and their family networks.

The loss of valuable indigenous knowledge systems from the impact of HIV/AIDS is another concern within this rhetoric (Mutangadura *et al.*, 1999; IFAD, 2001; de Waal and Tumishabe, 2003; Harvey, 2003; Drimie, 2004). It is understood that the chain of knowledge transfer between generations is broken through the loss of skills and experience through the HIV/AIDS related death of adult family members (de Waal and Tumishabe, 2003). This being said when speaking to a group of six teenage boys at Coffee Bay, I enquired if they ever questioned elder members of the community about different issues. They responded by saying that they often speak to their grandparents or parents about best practice when it comes to ploughing, maintaining cattle health, hunting and fishing. This open dialogue between the rural youth and their elders, is therefore opening up forums between generations and allowing the flow of trans-generational knowledge. Similar findings were illustrated by Setalaphruk and Leimar Price (2007) in a study investigating rural children's local ecological knowledge in Thailand, whereby knowledge was developed through personal experience, practice and consultation with older family members. Transfer of knowledge from grandparents to children was one of the most common forms of knowledge transfer (Setalaphruk and Leimar Price, 2007), as there was a definite absence of the parental generation due to urbanization. At Coffee Bay children learnt and developed knowledge through experimenting and transferring knowledge among each other. While observing hunting parties in Coffee Bay, I noticed that older boys would show younger boys how to excite the dogs, or how to sharpen sticks. This is consistent with Setalaphruk and Leimar Price's (2007) research where early development of local ecological knowledge relied heavily on adults guidance and influences, however later on their development the children were found to interact more with friends and their knowledge was expanded through group play and experimentation (Setalaphruk and Leimar Price, 2007). This means that there is not necessarily a direct loss of skills and experience through HIV/AIDS, and that certain knowledge and skill pathways remain open despite the effect of HIV/AIDS.

It seems that reciprocal networks no longer provide the kind of long term support they used to in the context of HIV/AIDS. With the erosion of such a culturally significant coping strategy, other strategies will have to take its place. Stealing or pretending one is full by drinking water will not help children cope with their hunger. It would appear that the quickest, most efficient, free and reliable food source currently available to vulnerable rural children can be gathered or hunted within their surrounding natural ecosystems. In addition to this the use of these natural ecosystems as a strategy for coping with the impacts of HIV/AIDS, provides physiological, psychological, economic and cultural support to vulnerable individuals.

Natural resources can therefore be seen as a last resort “safety-net” for vulnerable rural individuals afflicted by the impacts of HIV/AIDS. This safety-net could possibly slow down an individual’s trajectory towards severe impoverishment, despite the reality that their households have dissolved from the adverse impacts of HIV/AIDS. In light of this we need to reconsider the perspectives we take when assessing impact of HIV/AIDS on rural communities. The current scale and level of impact of HIV/AIDS has directed researchers and development practitioners to seek out a direct “cause and effect” relationship between HIV/AIDS and poverty, most often using households as the scale of measurement. It is important to remember that HIV/AIDS is not a cause of a food crisis, but rather correlated to an already existing crisis (Drimie and Gandure, 2005); and as Harvey (2003) argues, we must ensure that we do not overly marginalize the other complex causes (and effects) of food insecurity in sub-Saharan Africa by trying to uncover the relationship between HIV/AIDS and food security.

## *Chapter four:*

### *An interactive investigation of the impact of HIV/AIDS on rural childrens' reliance on natural resources*

*"My favorite thing to do is go fishing."*

Christoff, 12 year old boy, Coffee Bay

#### **4. 1. Introduction**

##### *4.1.1 Rural children, HIV/AIDS and harvesting of wild foods*

Globally, South Africa has the greatest number of people living with HIV and AIDS, and one of the highest prevalence rates in sub-Saharan Africa (UNAIDS/WHO, 2006). The impacts of the pandemic are keenly felt and every day it poses formidable and complex challenges to rural people, support NGOs, conservationists, sustainable development practitioners and scientists. The quest for solutions to the challenges is well advanced in many disciplines, particularly around health and education, however, in comparison; the impact of HIV/AIDS on biodiversity has been little explored in South Africa and elsewhere (Barany *et al.*, 2001).

It is widely understood that wild foods constitute a significant component of rural people's diets (High and Shackleton 2000; FAO, 2002; Manika and Trivedi, 2002; Barany, 2003; de Merode *et al.*, 2004; Lowassa *et al.*, 2004; Shackleton and Shackleton, 2004 a; Swallow *et al.*, 2004; Takasaki *et al.*, 2004; Barany *et al.*, 2005; Frison *et al.*, 2005), but the role of children in the acquisition of wild foods has rarely been considered, and how this is affected by high prevalence rates of HIV/AIDS remains unknown. Childrens' diets in rural areas of South Africa are of poor quality, and consist mainly of carbohydrates or starches (Steyn *et al.*, 1993; van der Waal, 2004). However, there is increasing evidence that children are engaging in collection, trade or consumption of wild foods (Ferguson *et al.*, 1993; Sorensen, 1993; Madge, 1994; Cavendish, 2000; Shackleton *et al.*, 2002; Addis *et al.*, 2006; Chirwa *et al.*, 2006). Studies looking at collection of wild foods by rural children as a strategy to cope with the impacts of HIV/AIDS are non-existent. In the case studies highlighted in chapter one, as well as chapters two and three, wild food use by rural Eastern Cape children was identified as an important and regular activity that supplements their poor domestic diets. More specifically within the context

of HIV/AIDS, vulnerable children rely heavily on these foods to gain nutrition more regularly (see chapters two and three). Although it has been argued that wild foods are an important food supplement for vulnerable children, the frequency of wild foods in childrens' diets has yet to be quantified in the context of HIV/AIDS.

In this chapter, these more subtle details are explored and quantified with the use of diaries as a record of childrens' food intake, their activities and personal stories. This chapter investigates the quality of vulnerable rural childrens' diets longitudinally; it identifies the separate species harvested by the children and the different frequencies of these species in highly vulnerable (HV) and less vulnerable (LV) childrens' diets ("Vulnerability" refers specifically to the childrens' vulnerability to the impact of HIV/AIDS, according to the proxy indicator system designed to measure the impact of HIV/AIDS by SADC FANR (2003)). And finally, the proportion of time HV and LV children spend on chores, natural resource collection, schooling and play is compared, as well as gender based differences in these activities.

#### *4.1.2. Rationale and key questions*

The diaries allowed the children to communicate with me in a more open and receptive forum, which was fun, educational, and comfortable enough to allow the children to express their own personal stories. The information sourced from these interactive diaries has valuable applications, as it assists in creating meaningful and appropriate development interventions. Firstly, the quantification of the direct relationship between HIV/AIDS vulnerability and use of natural resources can be scrutinized through this diary technique. Understanding this relationship will assist not only in creating HIV/AIDS interventions, but can also guide community based conservation strategies in rural areas of the Eastern Cape; as wild food use by vulnerable rural children has implications both in the food security and natural resource management contexts. Secondly, the diaries are able to provide information that can support advocacy directed towards changing existing South African natural resource use and management legislation that hinders vulnerable rural childrens' ability to cope with poverty and HIV/AIDS.

The diaries were originally designed to overcome the limitations of the short data collection period of 24/48 hours (typical of the original Individual Dietary Diversity Scoring index (IDDS) (Swindale and Blinsky, 2005)) used in the other stages of this study (chapters two and three). The diary overcomes this short period by collecting a chronological fortnightly IDDS score, as well as allowing for dis-

aggregation of childrens' use of wild foods down to the species level. There were unintended outcomes from the diary, such as children telling their own stories, and the addition of details about other activities in which children were engaging.

Therefore, the key questions addressed in this chapter are as follows:

- What is the difference between HV and LV childrens' domestic diets over a two-week period?
- What is the difference between HV and LV childrens' wild food intake over a two-week period?
- What are the frequently harvested species by the children for food?
- How frequently do children engage in natural resource harvesting activities in comparison to other general activities such as work or play?

#### ***4.2. Study sites (Mabehana and Coffee Bay)***

The study sites were selected using information gathered in earlier research (see chapter two and three) through a broad study conducted in six sites, three coastal and three inland. The coastal site of Coffee Bay (31° 58' 0" S, 29° 9' 0" E) and the inland site of Mabehana ( 31° 54' 0"S, 29° 4' 0"E ) were selected as areas where further detail would be obtained, as baseline data on the impact of HIV/AIDS, dietary diversity and food nutrition per child had been previously collected.

The two sites fall in the Oliver Tambo District Municipality, of the Eastern Cape province of South Africa. The sites formed part of the former Transkei Bantu homeland created by the apartheid government's group areas act (Bank, 2002) (Figure 2.1). The people living in these villages are, for the most part, *AmaXhosa*, with the local language being *isiXhosa*. Historically this area was inhabited by two *AmaXhosa* clans, the *Bomvu* and *Abalungu*. Due to their history of exclusion and the migrant labour system, today people in both the sites experience high levels of rural poverty. The majority of households rely on government grants and remittances from urban family members. It is not uncommon to have a whole family surviving on a single pension.

The area is characterized by rolling hills which run parallel to the rivers into the sea. They are covered in grassland, with forest occurring within the valleys between the hills. The rivers carve

valleys through these hills, providing moist alluvial soils along the drainage lines, which provide perfect conditions for forest growth (Palmer *et al*, 2002). Settlements are situated on the higher hill ridges. Cultivated fields occur near the villages and are usually adjacent to a homestead. The temperature is moderate with a maximum of 21.5 degrees centigrade rising to 24 degrees centigrade in summer between October and March (Cawe, 1994). Winter months are cool and dry. Rain occurs mainly in the summer months between October and April. Mean annual rainfall is 1069 mm per annum (Palmer *et al*, 2002, regional average rainfall is 815 mm per annum. The vegetation is dominated by Eastern Thorn Bushveld (Low and Rebello, 1996) which consists of small shrubs and grasslands with numerous and extensive patches of forest, lying between the rolling hills (Acocks, 1988) and falls under the Tongoland-Pondoland Regional mosaic, which is a species-rich area. Fire and grazing are the key determinants of this vegetation type, but soil and climate are also important factors. The grassland is characterized by tall herbs, shrubs and tall, coarse grasses; this heterogeneity shows the strong succession towards forests (Low and Rebello, 1996).

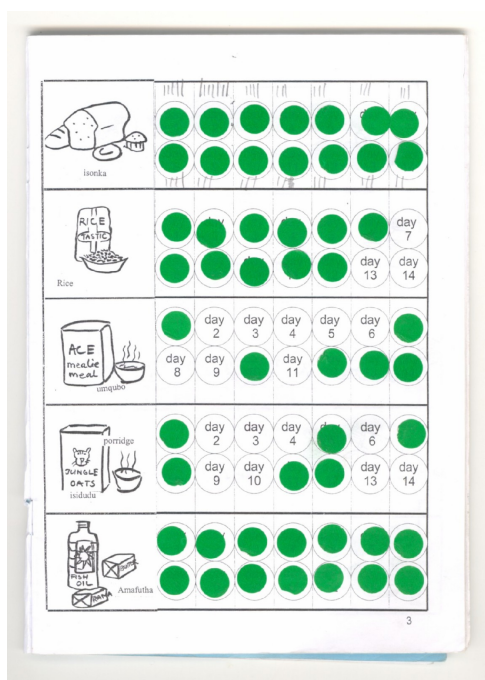
Within both sites the landscape itself contains a wealth of natural resources and valuable biophysical assets. The more inland site of Mabehana lies on the road to Coffee Bay running from the N2 main road between the towns of Dutwya and Mthatha. Mabehana lies approximately 15 km inland from Coffee Bay. It is situated high above the Mthatha River, on the southeast slopes of the river. The Mabehana study site runs from the Coffee Bay road down into the river valley. The landscape is characterized by grassy rolling hills, with deep gorges containing lush forests. Households are scattered across this region, however the majority of the households are found along the dirt road, which runs from the tarred Coffee Bay road down into the Mthatha River. There are three schools, and the closest clinic is approximately 5 km northwards along the Coffee Bay road. Coffee Bay is found on the coast, the study area is larger than the Mabehana study site. Coffee Bay is a popular tourist attraction, boasting spectacular scenery defined by a rugged coastline, rolling grassy hills and lush forests filling the valleys. Coffee Bay contains a more gentle topography than Mabehana. The study was conducted in six administrative 'villages' within the Coffee Bay site (the households, as with Mabehana, are scattered; they do not look like villages). There are six schools, a clinic, four hotels, three backpacker lodges, and holiday cottages intermingled between the villages along the coast. There are more job opportunities in Coffee Bay than Mabehana; it is not uncommon for some people from Mabehana to temporarily move to Coffee Bay in search of work. However within both sites the main form of income is through government grants and remittances from urban family members.



### 4.3. Methodology: application of interactive diaries

The methods used in this project were developed out of the need to increase the validity of the indicator used for quantifying rural peoples' diet quality, that being the Individual Dietary Diversity score (IDDS) (Swindale and Blinsky, 2005). This methodology provides a forum for people to recall their diet over the past 24 hours. The foods they mention are then categorized into eight separate nutritional food groups for children and 12 separate groups for adults. Each group receives a score of one; therefore depending on the individual's diet one can rate their diet, on a scale between one and eight (for children). However, one of the main challenges I came across with the IDDS in the work predating this study was its short time scale. It can only give a reading for 24 hrs, with 48 hours being the maximum time over which an individual can remember what they have eaten. Due to the fact that I was getting children to recall their diet, 48 hours was far too long a time to get accurate results. In particular I was concerned that the children would forget less desirable foods in their recollection, which would seriously skew the results. To overcome this challenge I had to develop a system that allowed the children to keep track of their diet day by day, which led to the interactive food and activity diary (appendix C - The food diary). The diary provided all the possible options available to the children, therefore reducing the chance of omitting less memorable foods. The diaries allowed the children to communicate with me in a more open and receptive forum that was fun, educational, and comfortable enough to allow the children to express their own personal stories.

The initial pilot diary (which only assessed the diet) was tested in the inland site Mabehana. The



diary is formatted with pictures of a particular food, followed by two rows of seven circles numbered consecutively (Figure 4.1.). In the cover of the diary were stickers equal to the size of the “day-circles” which were used by the child to indicate the particular food that they ate on that day. The foods included both domestic foods as well as wild animals listed at the species level. The types of foods and animals in the book were chosen using data obtained from a previous study looking at childrens' use of wild foods across the Eastern Cape (chapter two). The use of stickers made the diary easy to complete, and overcame many of the problems relating to language or illiteracy.

Figure 4.1: A page from a completed diary

There were 37 domestic food options, 93 wild animal based foods and four plant based food options (plants were grouped into wild spinaches, wild fruits, and two species of wild fruit) from which the children could select (appendix C). A page at the end of the food diary section was left blank for children to fill out extra foods that were not displayed in the book. After piloting the book at Mabehana I found that the books were easy to use and children enjoyed using them. This gave me greater confidence in adding detail to the book, as well as adding on other sections. Two new sections were added to the book, these came in the form of a diary of the childrens' activities, and a personal diary, where children could express their problems and communicate with me openly and privately. It was necessary to add the activity diary to the food diary, as I was curious to quantify the activities in which children were engaging, that are typically considered adult activities. I was personally present during each individual child's explanation of how the food diary works, I relied on the help of translators and facilitators, to reduce the chances of information being lost in translation.

Using the data obtained from earlier surveys conducted with school and non school children (a total of 150 children in each site), I was able to classify each child into a vulnerability category (chapter two). Using proxy indicators for HIV/AIDS developed by SADC FANR (2003), I grouped children according to their vulnerability to HIV/AIDS. Children who showed no evidence of any of the proxies in their household were identified as children with Low Vulnerability to HIV/AIDS (LV), and children observed to have four or more of the proxies for HIV/AIDS in their household were classified as Highly Vulnerable (HV). I then selected 30 HV and 30 LV children at each site to provide diaries, resulting in a total of 120 individual children surveyed using food diaries.

The diaries were administered personally on a one to one basis. The session began with my translator and I reintroducing ourselves and reminding them what our study was about. We then requested permission from the child and guardian/parent/teacher to continue with the session. All the possible pros and cons of being involved in the study were expressed to the child and the respective adult responsible for the child. After verbal permission was granted, we began by talking informally about the child's diet, and likes and dislikes. After this a survey was conducted dealing with food security and coping strategies adopted by the child (chapter three). After this the diaries were presented and explained. Then with supervision and guidance from my translator and myself each child filled out the first day of the diary and asked questions (Figure 4.2). Once we were entirely sure that the child understood how to use the diary we left them with it to complete it out over two weeks. After they had completed the diary, we collected them from the children. There were 59 girls and 49 boys involved in

this project.



*Figure 4.2: Children at Coffee Bay learning how to use their food diaries with the assistance of Ntombekaya Tsheyi, lead facilitator and translator*

The dairies collected information on individual species of mammals and birds. Species were cross-referenced with the IUCN Redlist of Threatened Species (IUCN, 2007). The following tags are used to highlight each species' conservation status as assessed by the IUCN (Table 4.1):

Table 4.1: Vulnerability categories set by IUCN (2007)

EX	<b>Extinct</b>	No reasonable doubt that the last individual has died.
EW	<b>Extinct in the wild</b>	Known only to survive in captivity or as naturalized populations well outside its previous range.
CR	<b>Critically Endangered</b>	The species is in imminent risk of extinction in the wild.
EN	<b>Endangered</b>	The species is facing an extremely high risk of extinction in the wild.
VU	<b>Vulnerable</b>	The species is facing a high risk of extinction in the wild.
NT	<b>Near Threatened</b>	The species does not meet any of the criteria that would categorise it as risking extinction but it is likely to do so in the future.
LC	<b>Least Concern</b>	There are no current identifiable risks to the species.
DD	<b>Data Deficient</b>	There is inadequate information to make an assessment of the risks to this species.

The species were assessed using an earlier set of criteria. Species assessed using this system have the following instead of Near Threatened and Least Concern categories (Table 4.2):

Table 4.2: Earlier vulnerability categories set by IUCN

LR/cd	<b>Lower Risk/conservation dependent</b>	Species which were the focus of conservation programmes and may have moved into a higher risk category if that programme was discontinued.
LR/nt	<b>Lower Risk/near threatened</b>	Species which are close to being classified as Vulnerable but are not the subject of conservation programmes.
LR/lc	<b>Lower Risk/least concern</b>	Species for which there are no identifiable risks.

Data extracted from the diaries was collated with Open Office Calc. Data was tested for normality, due to the lack of normality, the non-parametric Mann-Whitney test was used to test significances.

There are some assumptions and pitfalls associated with the food diary. Although I allowed space at the end for children to fill in foods or activities that I may have left out, the diary itself is based on the assumption that the domestic foods and wild food species were the sum total of the childrens' consumption. Realistically however, certain foods would have been omitted. To prevent the food diary from becoming too lengthy, I only made space for a detailed species inventory for birds and mammals. Fish, reptiles, insects, plants and coastal resources were not an entire and complete inventory of individual species; only the species most commonly mentioned by the children previously were included. There is the possibility that one child's meal may have been shared with other children, and therefore one meal may have been reflected in more than one diary; in my analysis I assumed that one recorded incident of eating a wild animal reflected the consumption of an entire individual animal.

The addition of a refining indicator for shared meals would have made the diary too large and complicated. Another assumption made for this study is that the children would complete the diaries honestly. In the context of this study I therefore assume the children filled the diaries out accurately with regards to their personal diet.

#### **4.4. Results**

##### *4.4.1. The status of the childrens' diets over a two week period*

As expected, the childrens' domestic meal consisted mainly of starches. The most common food eaten by the children was *Nqusho*, which is a mixture of corn and sugar beans (with a ratio usually two parts corn to one part beans). The presence of fresh vegetables and meat was rare relative to starches. The total IDDS for the children at the two sites was 37 % lower than the recommended IDDS for children set by the FAO. Also without the contribution of wild foods to the children's diets (i.e. the domestic meal itself) the IDDS was 50 % lower than the recommended IDDS for children. There were no significant differences between the HV and LV childrens' diets (Table 4.3). Similarly there were no significant differences between boys and girls diets, with the exception of the total IDDS for boys and girls at Mabehana (Table 4.4). It is interesting to note that none of the children in Coffee Bay or Mabehana received an average domestic IDDS score of eight, which is the FAO standard score indicating a healthy diet. However, with the contribution of wild foods in their diet, six children (12 %) at Coffee Bay and two children (3 %) at Mabehana had their total IDDS raised to eight. The childrens' diets in both sites were of poor quality, due to their lack of diverse foods available to the children in their homes. Wild foods improved the childrens' diets at Coffee Bay by 23 %, and 12 % at Mabehana. Although the contribution of wild foods is relatively low statistically, according to the childrens' food diaries, the contribution of just one food group from the wild is a significant improvement considering their poor quality diets.

Table 4.3: Differences in mean ( $\pm$  standard deviation) Individual Dietary Diversity Scores (IDDS) between HV and LV children in Coffee Bay and Mabehana (IDDS calculated from average IDDS over 14 days)

	<i>Low Vulnerability</i>		<i>High Vulnerability</i>		<i>P value</i>		<i>Total IDDS for all children</i>	
	<i>Coffee Bay n=24</i>	<i>Mabehana n=29</i>	<i>Coffee Bay n=25</i>	<i>Mabehana n=30</i>	<i>Coffee Bay (HV vs LV)</i>	<i>Mabehana (HV vs LV)</i>	<i>Coffee Bay n=53</i>	<i>Mabehana n=59</i>
Domestically sourced foods (IDDS)	5 $\pm$ 1	4 $\pm$ 1	4 $\pm$ 1	4 $\pm$ 1	0.43	0.43	4 $\pm$ 0	4 $\pm$ 2
Wild sourced foods (IDDS)	2 $\pm$ 1	1 $\pm$ 0	2 $\pm$ 1	1 $\pm$ 0	0.45	0.45	1 $\pm$ 1	1 $\pm$ 1
TOTAL IDDS	6 $\pm$ 1	4 $\pm$ 2	5 $\pm$ 2	4 $\pm$ 1	0.46	0.46	5 $\pm$ 1	5 $\pm$ 3
% Contribution of wild food to total diet	20 $\pm$ 10	11 $\pm$ 8	25 $\pm$ 15	13 $\pm$ 11	0.67	0.67	22 $\pm$ 4	12 $\pm$ 15

Table 4.4: Differences in mean (standard deviation) Individual Dietary Diversity Scores (IDDS) between girls and boys at Coffee Bay and Mabehana

	<i>Girls</i>		<i>Boys</i>		<i>P value</i>	
	<i>Coffee Bay n= 29</i>	<i>Mabehana n= 30</i>	<i>Coffee Bay n= 20</i>	<i>Mabehana n= 29</i>	<i>Coffee Bay (girls vs boys)</i>	<i>Mabehana (girls vs boys)</i>
Domestically sourced foods (IDDS)	4 $\pm$ 1	4 $\pm$ 1	4 $\pm$ 1	4 $\pm$ 1	0.57	0.43
Wild sourced foods (IDDS)	2 $\pm$ 1	1 $\pm$ 1	2 $\pm$ 1	1 $\pm$ 0	0.57	0.38
TOTAL IDDS	6 $\pm$ 2	4 $\pm$ 2	5 $\pm$ 2	5 $\pm$ 1	0.42	0.05
% Contribution of wild food to total diet	23 $\pm$ 15	11 $\pm$ 10	22 $\pm$ 9	12 $\pm$ 10	0.84	0.57

#### 4.4.2. Frequency and percent of HV and LV children using wild foods

Two separate forms of wild food consumption were extrapolated from the diaries. These include the frequency of an animal taxa/species in the child's diet and the proportion of children using/eating an animal taxa/species. In both the inland and coastal sites children in the HV group were observed to hunt more regularly and consequently consumed more wild meat than LV children (Figure 4.3. a, c). Birds were the most frequently consumed terrestrial vertebrate, and were significantly higher ( $p < 0.05$ ) in the diet of HV children than LV of children at Coffee Bay (Table 4.5). So too was the proportion of children in the HV group that engaged in the hunting of birds ( $p < 0.05$ ). Small mammals were the second most frequent items, and were also significantly higher ( $p < 0.05$ ) in the HV group.

High vulnerable and low vulnerable children at Mabehana had noticeable differences in the frequency of consumption of birds and mammals; however these frequencies were not statically significant.

Nevertheless, there were significantly larger proportions of HV children engaging in bird ( $p < 0.05$ ), mammal ( $p < 0.05$ ) and reptile ( $p < 0.05$ ) hunting.

Generally, reptiles and insects had a low occurrence in the diet because they are commonly considered as an undesirable wild food by the majority of the children interviewed. It is interesting to note that HV children had higher frequencies of less desirable animals in their diets, such as reptiles and insects than LV children (Figure 4.3. a, c).

Wild fruits and wild spinaches were consumed by both vulnerability groups. Mabehana showed a significant difference between HV and LV children using wild spinaches ( $p < 0.05$ ), with higher frequencies of wild spinaches in HV childrens' diets than LV children (Figure 4.6. d). In Coffee Bay however, there were higher frequencies of wild spinaches in LV childrens' diets than HV ( $p < 0.05$ ) (Figure 4.3. b). What could be causing this discrepancy is unknown, however it could be due to the fact the LV children have greater access to food gardens, and that wild spinaches are more prolific in these gardens, therefore increasing their consumption of wild spinaches.

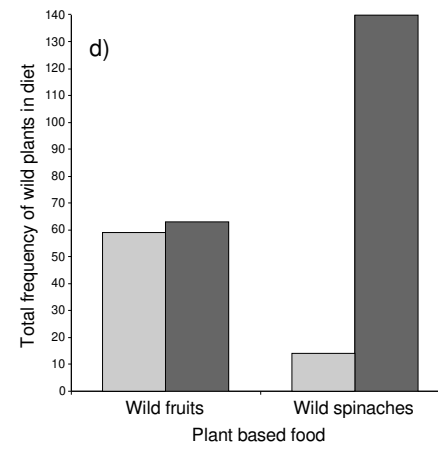
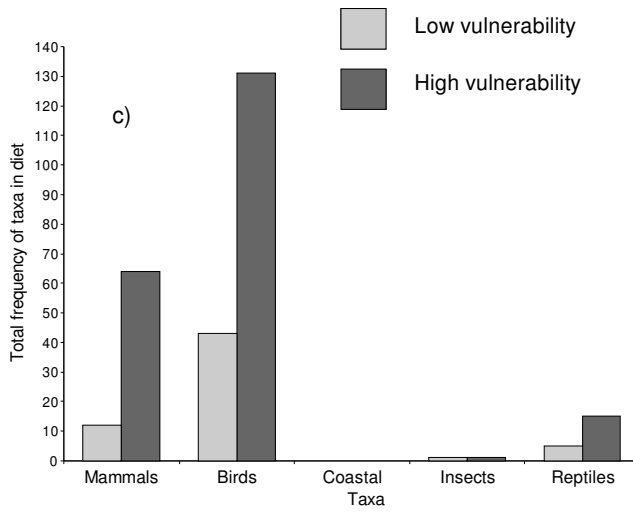
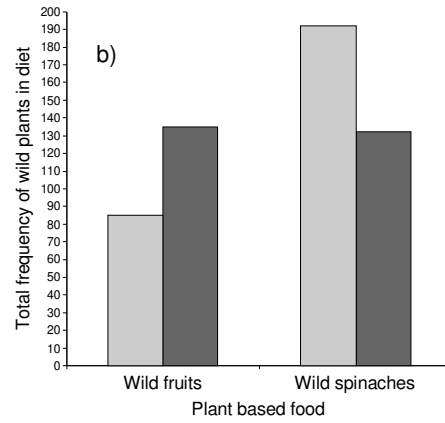
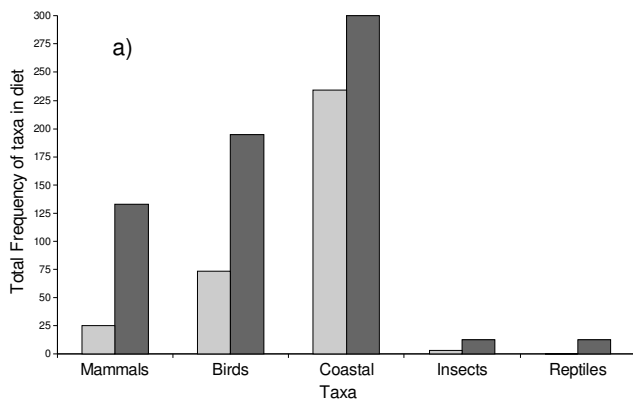


Figure 4.3: The total frequency of animal taxa and plant based foods in HV and LV in all childrens' diets at Coffee Bay (a and b) and Mabehana (c and d)



Table 4.5: Frequency of wild animals in HV and LV childrens' diets over a two week period, as well as the percent of children hunting each taxonomic group at Coffee Bay and Mabehana (significance testing via Mann-Whitney test, chi-squared test for % using)

<b>Taxa</b>		<b>Low Vulnerability</b>		<b>High Vulnerability</b>		<b>P value</b>	
		<i>Coffee Bay</i> n=24	<i>Mabehana</i> n=29	<i>Coffee Bay</i> n=25	<i>Mabehana</i> n=30	<i>Coffee Bay</i> (HV vs LV)	<i>Mabehana</i> (HV vs LV)
<b>Mammals</b>	Frequency in diet (Mean & Std Dev)	1 ± 2	0 ± 1	5 ± 9	2 ± 9	0.04	0.31
	% Using	33	10	60	23	0.06	0.01
<b>Birds</b>	Frequency in diet (Mean & Std Dev)	3 ± 8	2 ± 4	8 ± 12	4 ± 12	0.02	0.25
	% Using	25	24	64	40	0.01	0.03
<b>Reptiles</b>	Frequency in diet (Mean & Std Dev)	0	0 ± 1	1 ± 2	1 ± 1	0.33	0.23
	% Using	4	7	12	17	0.03	0.02
<b>Insects</b>	Frequency in diet (Mean & Std Dev)	0 ± 1	1 ± 4	1 ± 1	2 ± 4	0.05	1
	% Using	4	3	24	3	0.05	1
<b>Coastal Resources</b>	Frequency in diet (Mean & Std Dev)	8 ± 5	-	5 ± 4	-	0.37	-
	% Using	91	-	96	-	0.53	-
<b>Wild Spinaches</b>	Frequency in diet (Mean & Std Dev)	8 ± 5	2 ± 3	5 ± 4	2 ± 4	0.02	0.55
	% Using	96	79	96	90	0.57	0.03
<b>Wild fruits</b>	Frequency in diet (Mean & Std Dev)	4 ± 4	4 ± 4	5 ± 6	5 ± 4	0.37	0.78
	% Using	71	48	80	43	0.45	0.47

At both sites, there were noticeable differences in the consumption of wild food between boys and girls (Figure 4.4). Generally it was understood among the children that hunting mammals was mostly a boy's occupation, with girls sometimes following the boys, or enjoying the spoils of the hunt with the boys. However, the collection of wild spinaches and shellfish is usually the girl's domain. The data retrieved from the diaries reflected these gender differences (Figure 4.4). The food diaries showed that boys consumed significantly more mammals and birds than girls at Coffee Bay ( $p < 0.001$ ) and Mabehana ( $p < 0.001$ ) (Table 4.6). Boys were also recorded consuming a higher frequency of less desirable animals in their diet, with more reptiles in their diet than girls ( $p < 0.001$ ) (Table 4.6). Girls consumed more coastal resources than boys at both Mabehana ( $p < 0.001$ ) and Coffee Bay ( $p < 0.05$ ). At both sites girls consumed more wild spinach, with Mabehana girls consuming significantly more than boys ( $p < 0.05$ ). More boys ate wild fruits at Coffee Bay ( $p < 0.05$ ).

Table 4.6: Frequency (mean and standard deviation) of wild animals in girls and boys diets over a two week period, as well as the percent of children hunting each taxonomic group at Coffee Bay and Mabehana (significance testing via Mann-Whitney test and chi-squared test for % using)

<b>Taxa</b>		<b>Girls</b>		<b>Boys</b>		<b>P value</b>	
		<i>Coffee Bay</i> n=28	<i>Mabehana</i> n=30	<i>Coffee Bay</i> n=21	<i>Mabehana</i> n=29	<i>Coffee Bay</i> (girls vs boys)	<i>Mabehana</i> (girls vs boys)
<b>Mammals</b>	Frequency in diet (Mean & Std Dev)	2 ± 4	0 ± 1	5 ± 10	2 ± 9	0.09	0.13
	% Using	62	69	36	7	<0.001	<0.001
<b>Birds</b>	Frequency in diet (Mean & Std Dev)	5 ± 12	2 ± 4	6 ± 9	4 ± 12	0.15	0.06
	% Using	62	45	36	20	<0.001	<0.001
<b>Reptiles</b>	Frequency in diet (Mean & Std Dev)	0 ± 2	0	1 ± 2	1 ± 1	0.19	<0.001
	% Using	14	24	4	0	<0.001	<0.001
<b>Insects</b>	Frequency in diet (Mean & Std Dev)	0 ± 1	0	0 ± 1	0 ± 1	0.97	0.29
	% Using	14	10	14	3	1	0.04
<b>Coastal Resources</b>	Frequency in diet (Mean & Std Dev)	12 ± 13	-	10 ± 10	-	0.81	-
	% Using	100	-	96	-	0.04	-
<b>Wild Spinaches</b>	Frequency in diet (Mean & Std Dev)	8 ± 5	5 ± 4	6 ± 5	4 ± 4	0.22	0.94
	% Using	95	90	93	80	0.55	0.05
<b>Wild fruits</b>	Frequency in diet (Mean & Std Dev)	6 ± 6	2 ± 4	3 ± 4	3 ± 3	0.13	0.04
	% Using	71	59	75	30	0.52	<0.001

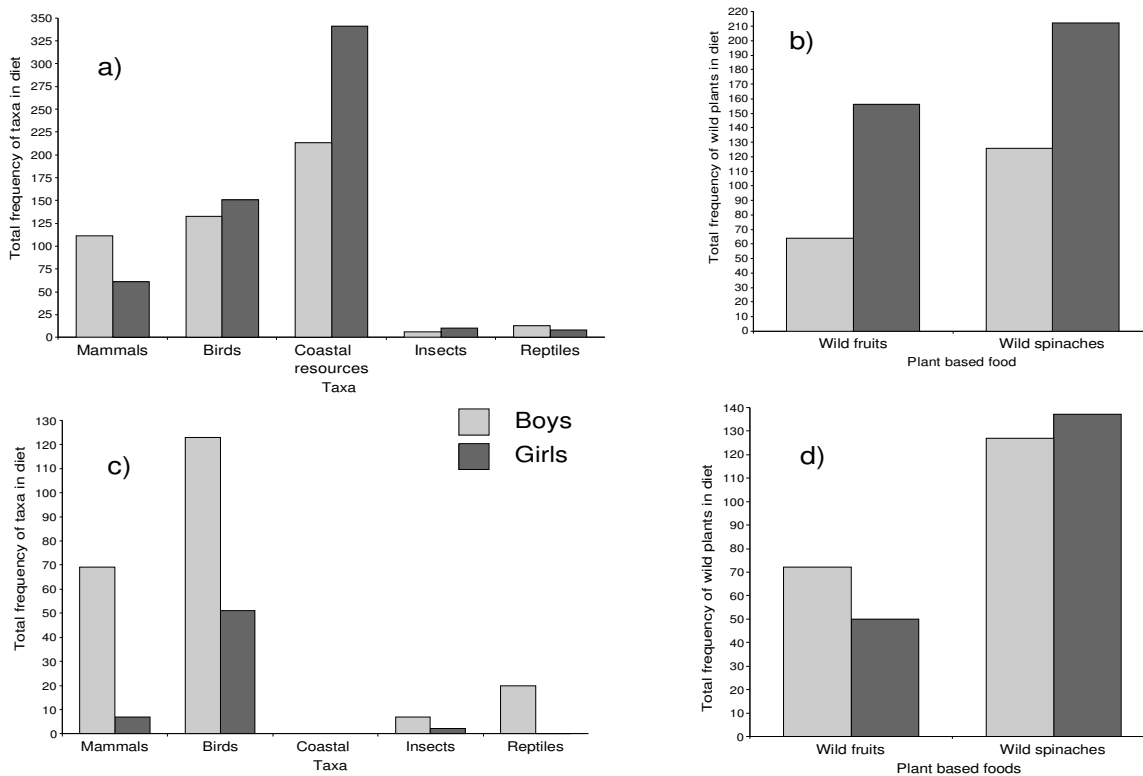


Figure 4.4: The total frequency of animal taxa and plant based foods in boys and girls in all childrens' diets at Coffee Bay (a and b) and Mabehana (c and d)

#### 4.4.3. Pressures on individual species (mammals and birds)

Within the two-week period, from the 49 respondents at Coffee Bay, a total of 493 meals that included wild-sourced meat were recorded. From the 59 Mabehana respondents a total of 279 meals included wild-sourced meat. In this short period a total of 22 mammal and 25 bird species were recorded comprising 172 individual mammals and 284 birds at Coffee Bay. At Mabehana a total of 32 mammal and 26 bird species, with 76 individual mammals and 174 birds were consumed in the two-week period. Individual insect and reptile species were not recorded. Table 4.7 contains a comprehensive list of harvested bird and mammal species, their conservation status, defined by the IUCN Redlist of Threatened Species (IUCN, 2007) (For definitions of IUCN conservation status see Table 4.1-2) and the frequencies of the individual species in the diets of the children keeping diaries over two weeks.

All of the top five most consumed birds and mammals by 108 children in both sites, were listed as least concern on by IUCN Redlist of Threatened Species (IUCN, 2007). The most frequently consumed mammals were hyraxes and small antelope, (Table, 4.7) while the most commonly hunted birds were starlings and bulbuls. The most frequently consumed wild plants were wild spinaches (462 incidences within childrens' diets), mussels were the most frequently consumed coastal resource, (134 incidences within childrens' diets). The monitor lizards (*Varanus albigularis albigularis*) were the most popular reptile consumed by the children in both sites (15 incidences within childrens' diets), and insects were also consumed, with flying ants (*Isoptera Kalotermitidae*) being the most frequently consumed insect (13 incidences within childrens' diets).

There are two species of particular conservation concern: the southern giant petrel (*Macronectes giganteus*) and the giant golden mole. The petrel is categorized as a vulnerable species by the IUCN red data list, i.e. it faces a high risk of extinction in the wild. There were 11 petrel hunted in total, seven at Mabehana and four in Coffee Bay. The giant golden mole (*Chrysothalax trevelyani*) may also be threatened by children hunting them at the two sites, as the giant golden mole is an IUCN endangered species, i.e. it faces an extremely high risk of extinction in the wild. There were two golden moles hunted and eaten in each site, therefore a total of four moles in two weeks.

Table 4.7: Inventory of the harvested bird and mammal species according to their frequency in childrens' diets in Coffee Bay and Mabehana over a period of two weeks

<i>Bird species harvested</i> (Common name, Latin name)	IUCN status	<i>Frequency in diet</i>		<i>Mammals species harvested</i> (Common name, Latin name)	IUCN status	<i>Frequency in diet</i>	
		Coffee Bay	Mabehana			Coffee Bay	Mabehana
Red-winged starling ( <i>Onychognathus morio</i> )	LC	40	20	Rock hyrax ( <i>Procavia capensis</i> )	LC	41	8
Black-eyed bulbul ( <i>Pycnonotus barbatus</i> )	LC	37	20	Tree hyrax ( <i>Dendrohyrax arboreus</i> )	LC	26	1
Cape-turtle dove ( <i>Streptopelia capicola</i> )	LC	26	13	Blue duiker ( <i>Cephalophus monticola</i> )	LR/lc	20	1
Sunbirds ( <i>Nectarinia spp.</i> )	LC	23	10	Greater red rock rabbit ( <i>Pronolagus crassicaudatus</i> )	LR/lc	15	2
Fiscal shrike ( <i>Lanius collaris</i> )	LC	19	8	Vervet monkey ( <i>Cercopithecus aethiops</i> )	LR/lc	14	1
Laughing dove ( <i>Streptopelia senegalensis</i> )	LC	17	10	Common duiker ( <i>Sylvicapra grimmia</i> )	LR/lc	9	-
Knysna loerie ( <i>Tauraco corythaix</i> )	LC	16	3	Scrub hare or cape hare ( <i>Lepus capensis</i> or <i>L. saxatilis</i> )	LR/lc	8	4
Nightjar ( <i>Caprimulgus, species unknown</i> )	LC	14	7	African wild cat ( <i>Felis lybica</i> )	?	6	5
Speckled mousebird ( <i>Colius striatus</i> )	LC	13	6	Otter spp ( <i>Aonyx capensis, Lutra maculicollis</i> )	LC	5	-
Common quail ( <i>Corturnix corturnix</i> )	LC	13	6	Bushpig ( <i>Potamochoerus porcus</i> )	LR/lc	5	-
Duck ( <i>species unknown</i> )	LC	12	-	Chacma baboon ( <i>Paipo cynocephalus</i> )	LR/lc	4	-
Rednecked francolin ( <i>Francolinus afer</i> )	LC	8	7	SA warthog ( <i>Phacochoerus aethiopicus</i> )	LR/lc	4	2
Sombre bulbul ( <i>Andropocus importanus</i> )	LC	7	7	Yellow mongoose ( <i>Cynictis pencilata</i> )	LR/lc	3	5
Raptor ( <i>species unknown</i> )	-	6	4	Bushbuck ( <i>Tragelaphus scriptus</i> )	LR/lc	3	2
Trumpeter hornbill ( <i>Bycanistes bucinator</i> )	LC	5	2	Black-backed jackel ( <i>Canis mesomelas</i> )	LR/lc	2	3
Cape comorant ( <i>Phalacrocorax capensis</i> )	LC	5	3	Giant golden mole ( <i>Chrysospalax trevelyani</i> )	EN	2	2
Hadada ibis ( <i>Bostrichia hagedash</i> )	LC	5	1	African civet ( <i>Civetticus civetta</i> )	LR/lc	1	1
Southern giant petrel ( <i>Macronectes giganteus</i> )	VU	4	7	Nyala ( <i>Tragelaphus agasi</i> )	LR/cd	1	-
Kelp gull ( <i>Larus dominicanus</i> )	LC	4	6	Striped (cape) polecat ( <i>Ictonyx striatus</i> )	LR/lc	1	-

<i>Bird species harvested</i> (Common name, Latin name)	IUCN status	Frequency in diet		<i>Mammals species harvested</i> (Common name, Latin name)	IUCN status	Frequency in diet	
		Coffee Bay	Mabehana			Coffee Bay	Mabehana
Owl ( <i>Tyto alba</i> or <i>T. capensis</i> )	LC	4	4	Honey badger ( <i>Mellivora capensis</i> )	LR/lc	1	-
Helmeted guinea fowl ( <i>Numida meleagris</i> )	LC	2	2	Unidentified small rodent species	?	1	6
Yellow-rumped tinkerbird ( <i>Pongonilus bilineatus</i> )	LC	1	3	Grey duiker ( <i>Sylvicapra grimmia</i> )	LR/lc	-	5
Hoopoe ( <i>Upupa epops</i> )	LC	1	4	Bats species ( <i>Spp unknown</i> )	?	-	4
Ludwig's bustard ( <i>Neotis Ludwigii</i> )	LC	1	1	SA porcupine ( <i>Hystrix africaeaustralis</i> )	LC	-	3
Stork ( <i>Mycteria ibis</i> or <i>Ciconia ciconia</i> )	LC	-	4	Savanna cane rat ( <i>Thryonomys swinderianus</i> )	LR/lc	-	3
Heron ( <i>species unknown</i> )	LC	-	3	Antbear, aardvark ( <i>Orycteropus afer</i> )	LC	-	3
				Cape grey mongoose ( <i>Herpestes pulverulenta</i> )	LR/lc	-	2
				Shrew species ( <i>Soricidae</i> )	LC	-	2
				SA hedgehog ( <i>Atelerix frontalis</i> )	LR/lc	-	2
				Caracal ( <i>Felis caracal</i> )	LC	-	1

#### 4.4.4. Childrens' activities

Table 4.8 indicates the average period of time (measured as number of days indicated by the child in their diary) HV and LV children spent on each separate activity (Agricultural management includes: herding livestock, ploughing fields/gardens; planting and watering gardens and harvesting vegetables.



Figure 4.5: Girls collecting water at a community tap in Coffee Bay

Household management includes: repairing fences, floors, roofs, etc.; cleaning the house; and cooking. Harvesting wild food includes: hunting mammals, birds and reptiles, collecting coastal resources and collecting fruits and wild spinaches).



Figure 4.6: Girl cooking on an open fire at Coffee Bay

These results do not show any indicative differences between HV and LV children when it came to agricultural management; household management, fuel wood collection and harvesting wild food. However, in Coffee Bay, HV children spent significantly less time playing ( $p < 0.05$ ) and attending school ( $p < 0.05$ ). Table 4.9 indicates clearly that within Coffee Bay ( $p < 0.001$ ) and in Mabehana ( $p < 0.001$ ) boys spent a significantly larger amount of time managing agricultural lands than girls. Similarly within Coffee Bay ( $p < 0.001$ ) and Mabehana ( $p < 0.001$ ) girls spent a

significantly larger amount of time collecting fuel wood. This is clear evidence of gender-defined roles among children.

Table 4.8: Number of days in two week period spent in various activities between HV and LV children at Coffee Bay and Mabehana

Activities	Low Vulnerability		High Vulnerability		P value	
	Coffee Bay n=24	Mabehana n=29	Coffee Bay n=25	Mabehana n=30	Coffee Bay (HV vs LV)	Mabehana (HV vs LV)
Agricultural management	2 ± 2	2 ± 3	1 ± 2	3 ± 3	0.11	0.16
Household management	8 ± 3	6 ± 3	6 ± 3	6 ± 3	0.10	0.64
Fuel wood collection	6 ± 6	3 ± 4	4 ± 4	2 ± 3	0.10	0.94
Harvesting wild food	2 ± 3	1 ± 1	2 ± 2	1 ± 2	0.36	0.34
Attending school	10 ± 5	9 ± 4	2 ± 4	10 ± 4	<0.001	0.35
Playing	10 ± 5	9 ± 5	7 ± 5	9 ± 5	0.04	0.52

Table 4.9: Number of days in two-week period spent in various activities between boys and girls children at Coffee bay and Mabehana

Activities	Boys		Girls		P value	
	Coffee Bay n=21	Mabehana n=29	Coffee Bay n=28	Mabehana n=30	Coffee Bay (HV vs LV)	Mabehana (HV vs LV)
Agricultural management	3 ± 2	4 ± 2	1 ± 1	1 ± 2	<0.001	0.002
Household management	6 ± 3	6 ± 3	7 ± 3	7 ± 3	0.25	0.20
Fuel wood collection	1 ± 2	1 ± 2	8 ± 4	4 ± 4	0.001	<0.001
Harvesting wild food	3 ± 3	2 ± 2	1 ± 1	0	<0.001	0.07
Attending school	5 ± 6	10 ± 3	7 ± 5	9 ± 4	0.63	0.09
Playing	10 ± 5	10 ± 5	8 ± 5	8 ± 5	0.07	0.31

## 4. 5. Discussion

### 4.5.1. Wild foods supplement vulnerable childrens' diets

Generally within both sites, the childrens' diets at home were poor, and did not meet the required standards for healthy development (FAO and WHO, 2002). This is in accordance with most parts of rural South Africa, where diets are based on staple grains and are therefore high in carbohydrates and low in essential vitamins and complete animal-derived proteins (Steyn et al., 1993; van der Waal, 2004). There is indeed a direct need to supplement these poor quality diets and raise childrens' basic level of nutrition. The individual dietary diversity index recorded in the diaries provided a clear indication on how children were raising their diet quality by supplementing their daily intake with wild foods. There was one highly vulnerable girl in Coffee Bay for whom, over two weeks; wild food comprised 70 % of her diet. Also in Coffee Bay, nearly half (49 %) of another HV girl's diet was supplemented with wild food over two weeks. Coffee Bay showed six children whose diets consisted of over 35 % wild food. And in Mabehana, three HV childrens' diets were supplemented by more than 32 % wild food. These children show that there are a few children consume wild foods more regularly and in higher quantities than others, thus adding to size of the standard deviation found within the data. The large variability between different quantities of wild food rural children are consuming, may be determined by the childrens' personal access to food. Children experiences severe food shortages at home, are bound to seek out food from outside the home, and therefore consume far more than those children with adequate food supply. Although these results are not statistically significant, they do highlight the value wild foods have in supporting highly vulnerable children. These results are consistent with similar studies that clearly indicate the direct and immediate inputs into food and nutritional security from wild fruits, spinaches, nuts, seeds, grains, pulses and meats, to poor rural people's nutrition and ultimately their food security (Barany *et al.*, 2001; Barany, 2003; Gari, 2003; 2004). Consumption of wild foods by individual children has been documented in the literature, in a study by Addis *et al.* (2006) in Ethiopia, children in three districts were described as perennial users, consuming wild plants during seasons of food availability (sufficient crop stock), where adult consumption tended to decline. In South and southern Africa, the fruits of *Sclerocarya birrea* are widely consumed by children (Cavendish, 2000), and commonly traded for pocket money, or exchanged for other foods (Shackleton *et al.*, 2002), as are the fruits of the Rhum palm *Borassus flabellifer* and the velvet tamarind *Dialium guineense* in West Africa (Madge, 1994). In Malawi, although all generations engage in collection of wild fruits, it is primarily children who not only gather the bulk of produce (Chirwa *et al.*, 2006), but also consume the most wild foods as snack items



(Ferguson *et al.*, 1993). Although children eating wild plant source food are documented in the literature, studies documenting children consuming and collecting wild meat as a means to increase their nutritional deficiencies are rare, if not, non-existent.

Grittlesohn and Vastine (2003) argue that the selection, allocation and consumption of animal sourced foods as apposed to other plant source foods are the most highly regulated across social, environmental, cultural and economic factors; and that these regulations affect infants, young children, the sick, the elderly and women in transitory states. Wild animals were frequently recorded in the childrens' diets at Coffee Bay and Mabehana (Figure 4.4 and 4.5). Its possible that the children are avoiding the variety of socio-cultural and household regulations placed on the acquisition of animal source foods by hunting and collecting wild animals independently. Murphy and Allen (2003) have shown that animal source foods can provide a variety of micronutrients that are difficult to obtain in adequate quantities from plant-sourced foods alone. They analysed school childrens' diets in Egypt, Kenya and Mexico, and found six micronutrients that were particularly low in mainly vegetarian diets, namely: vitamin A, vitamin B-12, riboflavin, calcium, iron and zinc. The lack of these nutrients in the diet can result in anaemia, poor growth, rickets, impaired cognitive performance, blindness, neuromuscular deficits, and eventually death (Murphy and Allen, 2003). They state that animal sourced foods are particularly rich in all six of these micronutrients, and even small amounts of these foods, added to a vegetarian diet, can substantially increase their nutrient adequacy (Murphy and Allen, 2003; Rivera *et al.*, 2003). Therefore, even those children consuming relatively small amounts of wild meat at Coffee Bay and Mabehana, are reducing their chances of suffering from serious nutritional deficiencies.

For at least nine children in Coffee Bay and Mabehana, who were highly vulnerable to the impact of HIV/AIDS, locally acquired wild foods considerably changed the quality of their diets, and acted as a nutritional 'safety net'. The 'safety-net' function of wild foods to rural people during times of hardship has been documented in the recent literature (Byron and Arnold, 1999; Pattanayak and Sills, 2001, Shackleton *et al.*, 2002; Angelsen and Wunder, 2003; Senaratne *et al.*, 2003; Paumgarten, 2005).

#### 4.5.2. HIV/AIDS increases childrens' reliance on wild foods

It is apparent from the comparison of high vulnerability and low vulnerability children, that the impact of HIV/AIDS on rural children does indeed weaken their ability (or at least their parents/guardian's ability) to secure enough food, and therefore the results show HV children relying

more on wild foods for sustenance. With the high prevalence and growing progression of HIV/AIDS in the area (and South Africa as whole, (UNAIDS/WHO, 2006)), and the subsequent pressures this disease places on rural households (Barany *et al.*, 2001; de Waal and Whiteside, 2003), children will probably be pushed deeper into the surrounding landscapes to find more food as the agricultural productivity and purchasing power of the affected households decline. Barany *et al.* (2001) gathered considerable evidence that the impact of HIV/AIDS on rural people increases their reliance on natural resources both as a temporary coping strategy and/or as a more permanent adaptive strategy. Similar trends are observed with Coffee Bay and Mabehana's children, where HV children are collecting wild foods to cope with the lack of available nutrition in their homes, as nutritious foods are difficult to secure due to the erosion of assets and decrease in agricultural productivity caused by HIV/AIDS (Barany, 2003). There are significantly higher frequencies of mammals and birds in the diets of HV children at Coffee Bay (Table 4.5). Similarly, Mabehana shows significantly higher proportions of HV children using mammal and bird meat to support their poor diets. This undoubtedly indicates that children highly vulnerable to the pressures of the variety of impacts induced through HIV/AIDS are supplementing their meat intake with wild animal meat.

Current literature (Barany *et al.*, 2001; Pattanayak and Sills, 2001; Campbell *et al.*, 2002; Barany, 2003; Barany *et al.*, 2005) has illustrated that the reliance on wild foods is a strategy adopted at the household level to secure food for the family during times of hardship induced by the pressures of HIV/AIDS. The results from these diaries reveal that it is not only the household unit that relies heavily on wild foods during times of hardship, but also the children themselves collect wild foods as individuals.

Interestingly, HV children consumed higher quantities of less desirable animals than LV children. What may cause this is not directly known, however it is possible that there is a threshold of a child's vulnerability to HIV/AIDS beyond which they are forced to resort to less desirable wild foods in order to cope with their reduced diet quality. Understanding this, children who have to resort to harvesting less desirable species may possibly be an indicator of a highly vulnerable child to the impacts of HIV/AIDS. The indicator would need to be relative to the unit effort expended by each child. Alternatively the harvesting of small mammals by rural children could possibly be an indicator of ecosystem health. Pearce and Venier (2005) argue that small mammals act as useful bio-indicators for forest management, as small mammals play a vital role in forest ecology (Carey and Harrington, 2001). Although their study focused on boreal forests in Canada, it may be useful in guiding research

in the applicability of small South African mammals as bio-indicators. It would be efficient for a Community Based Natural Resource Management (CBNRM) program to create an indicator that records the diets of rural children (possibly within schools), and measures the frequency of small mammal consumption, to use as proxy indicators for forest health. This would be a cheap and useful way for communities not only to monitor childrens' health (ensuring no children fall between the cracks of health intervention) but also could act as a locally usable natural resource monitoring tool.

#### 4.5.3. Is HIV/AIDS jeopardizing local natural resources?

The majority of the animals and birds harvested by the children were not threatened according to the IUCN Redlist of Threatened Species (IUCN, 2007). However, there are two species consumed by the children at Coffee Bay and Mabehana that were of IUCN concern: the southern giant petrel (*Macronectes giganteus*) and giant golden mole (*Chrysospalax trevelyani*). Information on the direct impact the children are having on these two species is therefore needed. If this matter is not clearly investigated it might place further legislative obstacles to vulnerable childrens' reliance on hunting wild animals for food. The lists of species and the frequencies of these species in childrens' diets (Table 4.7) reveal that the most favoured bird and mammal species are not threatened according to the IUCN red list of threatened species. This is opposite to the significant international concerns around bushmeat hunting and trade in central and West Africa (Cowlshaw et al., 2005). The diaries indicated a relatively random selection of birds and mammals. The favoured consumption of Rock hyraxes (*Procavia capensis*) and Black-eyed bulbuls (*Pycnonotus barbatus*) is most possibly due to their high population densities in the study areas. Nevertheless, what impact these children are having on local populations of animals and plants is undetermined in the context of this project. What the data clearly shows, however, is that children highly vulnerable to the pressures of HIV/AIDS need natural resources to source wild food to support their diets. Therefore, conservation and child support interventions should prioritise the need to manage the habitats that these animals and plants occupy as to ensure continuous access to nutritious food for vulnerable rural children, coping with inadequate food security.

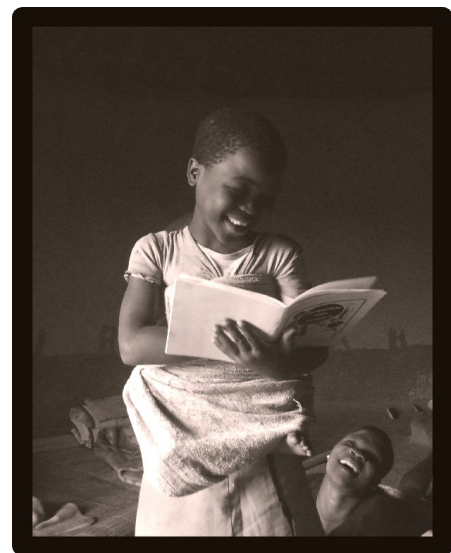


Figure 4.7. A girl showing her food diary to her family at Mabehana

#### *4.5.4. Gender defined wild food consumption*

The diaries showed the differences between the genders in the consumption of certain wild foods and gender defined chores. Hunting, tending cattle and working in the fields is considered a 'boys' domain, while collecting wild spinaches, shellfish and fuel wood seems to be 'girl' dominated activity. Within a social context, these gender-defined childhood domains are early expressions of gender division within these communities, and could be the place where children develop their identities and position within their own social contexts. From my observations there does not seem to be any other noticeable activities (other than school and sport) that separates the genders so clearly. Therefore, understanding the role natural resource use has in the social development of rural children may be useful within the context of CBNRM (Cloete, 2007). As the management of these resources will need to consider the delicate relationship between childrens' social development and the controlled sustainable use of natural resources. Also these differences in gender defined natural resource use could possibly reduce girl or boy children's access to certain valuably nutritious foods.

#### *4.5.5. The childrens' response to the diaries*

The diaries were useful tools in quantifying childrens' diets, and probing in further detail what comprised the diet, as well as indicating the time spent on activities typically considered as 'adult work' such as household and agricultural management. Dairies have been used in similar situations, with equal success, albeit usually with smaller samples (e.g. Mertz *et al.*, 2001; Chen *et al.*, 2004). The diaries had some inspiring and unexpected outcomes. There was one highly vulnerable 14-year-old boy who had never been to school and had therefore never used a book before. At first he was apprehensive about being involved with the diary project, as he felt that he would not be able to use the book, even after we explained he did not need to read to use the book, only count. His older sister (who could read) agreed to fill out the book for her brother. While we were explaining how the book worked, the boy became rather interested, and eventually was so excited that he was able to use a book. Two weeks later after the diaries were completed, and we returned to collect the books, he would not give it back, he had become so overjoyed with the fact that he could use a book. We left him with the book, and recorded his diet on site using another book, as well as leaving another empty book with him. The diaries were really useful in breaking down barriers, between the children, my translator and myself.

#### *4.5.6. Conclusions*

de Waal and Whiteside (2003) have proclaimed HIV/AIDS as a new variant famine, exacerbating already strained ecological and social environments. Understanding this, we must be proactive in our responses to pressures of HIV/AIDS on natural resources, whilst still appreciating the role of these resources in supporting vulnerable people, particularly children. We need to broaden our value definitions for natural resources to include natural areas as a valuable storehouse of nutritious food for highly vulnerable children coping with many of the impacts of HIV/AIDS. For future conservation initiatives to prosper and foster sustainable management of natural resources within the developing world, we will need to illuminate the shrouded impacts of HIV/AIDS, including those on use of biodiversity.

*Chapter five:*  
*General discussion and conclusions*

*“It feels heavy living under poverty,  
I will stop telling this story,  
I don't want your disappointment.”*

Bongiwe, 17 year old girl, Coffee Bay

*5.1. Overview*

In this final chapter, the role natural resources are playing in the lives of rural children vulnerable to HIV/AIDS is examined. The impact HIV/AIDS is having on food security and the sober reality of an AIDS induced famine in Africa is supported (de Waal and Whiteside, 2003). Generally, rural children's domestic access to food is weak, (staple foods being more expensive in rural communities than urban ones (NAMC, 2007), and their nutritional intake was found to be dangerously homogenous. In addition to this 66 % of the children surveyed in this study experienced some form of vulnerability from the impacts of HIV/AIDS (Section 2.4.1). These children were found to have weakened traditional support structures, thus coping by falling back on the traditional practice of hunting and collecting wild foods. These practices were found to improve their dietary quality and increase the frequency and quantity of food they were able to obtain. The commercialisation of wild foods was found to provide cash inputs to vulnerable children. The process of hunting and collecting wild foods provided some unintended outcomes, such as enriching children's emotional support through the development of peer-based support structures, nurturing feelings of empowerment through children improving their diets on their own and allowing for opportunities to play and have fun. The use of biodiversity was found also to enrich indigenous knowledge systems, which are also vulnerable to the impact of HIV/AIDS. While there are several benefits attained through the use of biodiversity by vulnerable rural children, the impact these activities are having on local biodiversity is raised. The obstacles influencing the freedom children have in using wild foods are described, along with the complexities of the conflicting ideas surrounding child labour. Overall this chapter synthesizes how wild food supplementation was found to reduce rural children's vulnerability to the impact of HIV/AIDS and draws support contemporary literature to identify possible intervention or mitigation strategies for the future.

## 5.2. HIV/AIDS and weakened food security

The variant new famine hypothesis suggested by de Waal and Whiteside (2003) may no longer be just a theory, as worldwide there is increasing evidence to support this hypothesis (Enwonwu and Warren, 2001; Gillespie *et al.*, 2001; Haddard and Gillespie, 2001; FAO, 2002; Piwoz and Preble, 2002; Save the children UK and Oxfam, 2002; de Waal ad Tumshabe, 2003; SADC FANR VAC, 2003, Gari, 2004). South Africa has the highest HIV/AIDS prevalence in the world (UNAIDS/WHO, 2006), with millions of families experiencing negative impacts on their socioeconomic structure and systems by HIV/AIDS. Evidence of the impact of this high prevalence is becoming more apparent, with rural South African's food security becoming even more stressed with the increase in AIDS cases. Rural people's access to nutritious food is weakening due to the impacts of the HIV and AIDS (HSRC, 2004). Children are a particularly vulnerable group to the impact of HIV/AIDS (Save the children UK and Oxfam, 2002), especially orphans, who constitute 13 % of all South African children and more than half of whom are orphaned by HIV/AIDS (UNICEF *et al.*, 2002; de Waal and Whiteside, 2003). Glewwe and Hall (1998) found that households with more children in them are more vulnerable to macroeconomic shocks. Therefore, the rate of orphaning in Africa further weakens households' resilience to major shock events.

HIV/AIDS disrupts all aspects of rural people's livelihoods (Baylies, 2002) with households selling assets as they loose vital economically active family members (Haddad and Gillespie, 2001; de Waal and Tumushabe, 2003; Drimie, 2004). With the loss of cash inputs into the household, as well as labour shortages (Kaschula, 2007 a; Hunter *et al.*, 2007) the household is unable to support itself and eventually dissolves (de Waal and Tumushabe, 2003). Traditionally the remaining survivors from a dissolved household would be adopted by extended family networks (Ankrah, 1993; Seeley, 1993; Ntozi, 1997; Tibajuka, 1997; Waller, 1997; Donahue, 1998; Rugalema, 1999). However, this thesis has revealed perhaps the early signs of the weakening ability of reciprocal networks, with afflicted households unable to return favours to supportive family and neighbours, thus cutting off the exchange of support. In chapter three the confessions of many children stated that they were unable to rely on extended family and neighbours for food and support. The weakening of reciprocal networks due to HIV/AIDS has been documented in the literature, with the depletion of household's assets due to the impact of AIDS (Hunter *et al.*, 2007), the household is less able to contribute to mutual assistance (Moser, 1998; Rakodi, 1999). As such children's options are severely reduced, and their vulnerability exacerbated.

### 5.3. *The role of wild food in ameliorating vulnerability*

The most obvious effects of children's vulnerable situations demonstrated by this study were those imposed on domestic diet quality. Within all six study sites, all of the children's domestic diets fell well below the FAO standards (FAO and WHO, 2002). The diversity of foods consumed by the children in the household was very poor, with meals dominated by carbohydrates and lacking protein, a finding which is consistent with studies in other parts of rural South Africa where diets are based on staple grains and are therefore high in carbohydrates and low in essential vitamins and complete animal-derived proteins (Steyn *et al.*, 1993; van der Waal, 2004). The frequency with which children were receiving highly nutritious food from home was also low within the six sites. While most of the children's domestic diets were dangerously poor, the independent supplementation of their diets with the consumption of wild foods was contributing valuable nutritional diversity to their food intake, which on average raised their dietary diversity and quality by 13 %. An average of 62 % of the 850 children surveyed ate wild food (see section 2.4.2 and 2.4.3). Wild food supplementation by the children also increased the frequency of nutritious food inputs into their diet; this was illustrated in the findings of chapter two and four. Not only did a high proportion of children engage in hunting and collecting wild food, but many of the children (33 %) had over half their diet consisting of wild food, with nine children having over 70 % of their diet supplemented by wild foods (see chapter two). Reliance on wild foods during times of hardship by rural people is well documented in the literature (Byron and Arnold, 1999; Pattanayak and Sills, 2001, Shackleton *et al.*, 2002; Angelsen and Wunder, 2003; Senaratne *et al.*, 2003; Paumgarten, 2005). While researching the impact of armed conflict on children in the Sudan and Somalia, MacAskill (1997) discovered that children displaced in these conflicts would rely on wild foods to enrich their diets. It can be clearly seen that falling back on wild foods during times of crisis is not necessarily just a rural adult's endeavour; rural children also use wild foods as a safety net to cope with the poor diets.

Considering the adverse impacts of HIV/AIDS on the children's households, and thus their reduced ability to secure foods from domestic sources, one would expect highly vulnerable children would rely more on wild foods than less vulnerable children. The significantly larger proportion of afflicted children consuming wild food than non-afflicted children was clearly demonstrated in section 2.4.5. Similarly, increased consumption of wild mammals and birds by highly vulnerable children was reported in section 4.4.2. On average, HIV/AIDS afflicted children consumed and hunted wild food with significantly higher frequency than less afflicted children. Ngwenya and Mosepele (2007) found that artisanal fishing among rural people in the Okavango Delta, Botswana, relied on fishing as a



natural safety net to buffer the impact of HIV/AIDS on their food security. While it is understood that a crucial part of household and community responses to the biophysical and socio-economic impacts of HIV/AIDS in sub-Saharan Africa comes from their use of natural resources and non-timber forest products (Hange *et al.*, 1999; Barany 2003; Barany *et al.*, 2005), these results imply that it is not only the household that uses wild natural resources as a strategy to cope with the impact of HIV/AIDS, but children as well. In chapter four, a possible threshold of vulnerability was mooted, that once surpassed children would consume less desirable wild food such as insects and reptiles. If this threshold could be investigated further, harvesting less desirable species by children could be used as a possible proxy indicator of the impacts of HIV/AIDS on a rural child.

The consumption of wild food not only reduces children's vulnerability to HIV/AIDS, but can also support people living with AIDS. In the presence of HIV/AIDS there is a need for greater nutrition, as HIV/AIDS places heavy demands on the micro- and macro-nutritional requirements of infected individuals (Vorster *et al.*, 2004). Good micronutrient nutrition decreases the risk of primary infection and prevents secondary infection (Friss, 1998; Vorster *et al.*, 2004), and afflicted individuals have an increase in protein requirements of up to 50 %, as well as a 15 % increase in energy requirements (Friss, 1998; Piwoz and Preble, 2002). The literature supports the promotion of wild food consumption among HIV/AIDS afflicted rural people, as it is highly nutritious and in many instances contains higher nutritional quality than domestic foods (Semba and Tang, 1999; Schippers, 2000; Kinyuy, 2001; Beisel, 2002; Piwoz and Preble, 2002). So having identified that rural children from afflicted households harvest and consume more wild foods than non-afflicted children, it was found that in addition to this 71 % of the children brought the wild food back home to be prepared and eaten. It could be assumed that these meals are shared with the household, if this is the case highly vulnerable could be supporting the nutrition of members of the household who are infected and possibly even children themselves (if they are infected) by increasing their nutritional intake and thus reducing the risk of secondary infection.

Contemporary research is investigating the role of many wild plant foods in South Africa. However, there is little to no literature focusing on rural people's reliance on small animals to supplement their low protein intake. In addition to this there is no literature, to my knowledge, that investigates the role of wild animals in children's lives made vulnerable by HIV/AIDS. This thesis has clearly provided evidence that children are engaging in natural resource utilization activities to cope with the adverse

impacts of HIV/AIDS. More specifically, this thesis has indicated that children are gaining a regular and crucial supply of wild animal based proteins from hunting, collecting shellfish and fishing. It was demonstrated within both chapter two and four that domestic diets were poor in protein and essential vitamins, however wild meat consumption among rural children could possibly make the difference between obtaining a meat meal per month (domestically sourced) to having a meat meal per week (from the wild). Such is the case in the six sites, where the majority of the children claimed they most often sourced meat domestically on the government grant pay day as opposed to weekly hunting, fishing and shellfish collection recorded in chapters two, three and four. This is a valuable finding as it reveals that not only is wild food supplementation improving vulnerable rural children's dietary diversity, but it is also increasing the quantity of protein in their diets. In chapter four, information on previous studies in Africa is provided which reveal that six micronutrients were particularly low in rural children's mainly vegetarian diets, namely: vitamin A, vitamin B-12, riboflavin, calcium, iron and zinc (Murphy and Allen, 2003). The lack of these nutrients can result in anaemia, poor growth, rickets, impaired cognitive performance, blindness, neuromuscular deficits, and eventually death (Murphy and Allen, 2003). However, animal sourced foods are particularly rich in all six of these micronutrients, and even small amounts of these foods, added to a vegetarian diet, can substantially increase their nutrient adequacy (Murphy and Allen, 2003). Therefore, the children's regular consumption of wild animal sourced protein, is probably playing a vital role in their health and wellbeing, which is invaluable considering these children's already jeopardised health in the context of rural poverty and HIV/AIDS in South Africa.



Figure 5.1: Children swimming and playing after they herded cattle down to the river near Coffee Bay

#### 5.4. The relationship between biodiversity and children's emotional wellbeing

It is generally agreed that people living in HIV/AIDS affected households are negatively affected psychologically (Mutangadura *et al.*, 1999; de Waal and Tumishabe, 2003; Drimie and Gandure, 2005). Depression and disempowerment increase within household supporting HIV/AIDS sufferers (de Waal and Tumishabe, 2003; Drimie and Gandure, 2005).

Reduced mental wellbeing further demotivates

family members, which further exacerbates the already existing household labour shortages. Although

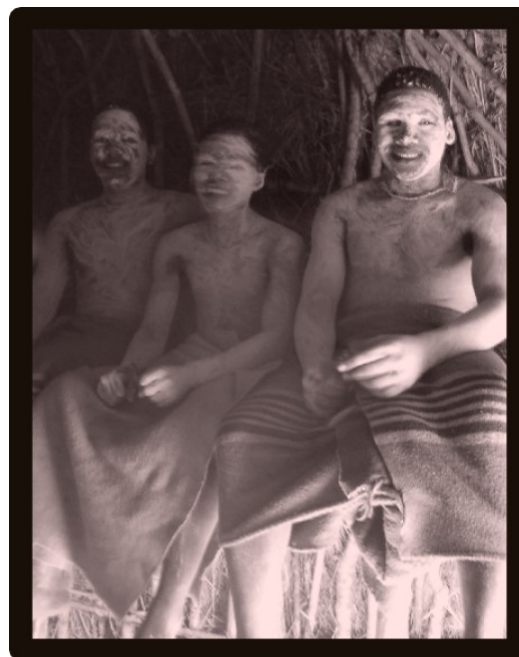
the situation seems unavoidable, there are subtle psychological support structures that vulnerable rural children are developing independently. The collection of wild food exhibited clear emotional and psychological benefits for these children. The hunting parties, fishing groups and other peer-cohorts developed for collecting natural resources, were often cited as fun activities, that involved play and open communication. It is clear to see the joy expressed by the children when swimming, hunting or fishing. Children living in HIV/AIDS afflicted households are not necessarily isolated into a complete vacuum with no psychological support, while they might lose family members from AIDS or their reciprocal networks erode, these children still have the support acquired from their own peer groups emerging from natural resource use, and developing independently from family networks. It is also important to note, that these peer cohorts, consisted of children from a variety of ages as mentorship from older children creates valuable emotional support for younger children. The mere fact that the children know that they can rely on an elder friend is reassuring.

#### *5.5. Shifting from a household to a individual perspective*

From this study, we now know that children's wild food use is an activity independent of adult food provision and formal meals, and shows potential in securing nutrition on a regular basis. It relies solely on the individual child and reflects one of the few instances in which children contribute directly to their own sustenance hereby providing considerable empowerment for the individual child vis-à-vis the feelings of powerlessness felt by rural youth. This subtle and almost secret world of vulnerable rural children would have remained undiscovered if we continued to assess the impact of HIV/AIDS at the household level. Within chapter three the value of shifting the scale of research from the household to the individual was suggested. While the current literature clearly shows that households as units are certainly not coping with the variety of pressures placed on them in the context of HIV/AIDS (Rugalema, 2000; Baylies, 2002; de Waal and Tumishabe, 2003) the autonomous coping strategies adopted by individual children of the household, are certainly offering some support to children despite the collapse of households. Therefore, there is a need to investigate the complex strategies and activities adopted by individual household members during the collapse of a household due to the impacts of HIV/AIDS in addition to assessing the household itself. As SADC FANR VAC (2003) argues, we need to aim our investigations into the impacts of HIV/AIDS on rural livelihoods within the context specific to a unique social group or area. This is crucial as the impact of HIV/AIDS on rural livelihoods is highly complex, and the coping strategies adopted by different social or demographic groups are equally complex.

### 5.6. The value of biodiversity and indigenous knowledge systems

Indigenous knowledge systems are also vulnerable to the impact of HIV/AIDS; this is commonly cited in contemporary literature (Mutangadura *et al.*, 1999; IFAD, 2001; de Waal and Tumishabe, 2003; Harvey, 2003; Drimie, 2004). The current understanding is that the chain of knowledge transfer between generations is broken through the loss of skills and experience through the HIV/AIDS related death of adult family members (de Waal and Tumishabe, 2003). While this might be the case, there is little published evidence from the perspective of individual children. Section 3.5.5 reveals the incidence of skills transfer between teenage boys and community elders at Coffee Bay. The boys admitted to regularly consulting their grandparents or parents about best practice when it comes to ploughing, animal husbandry, hunting and fishing. This open dialogue nurtures relations between generations and allows trans-generational knowledge to flow freely. Setalaphruk and Leimar Price (2007) have revealed the extensive local ecological knowledge of rural children of Thailand, whereby knowledge was developed through personal experience, practice and consultation with older family members. The transmission of knowledge through grandparents was one of the most common forms of knowledge transfer in village assessed by Setalaphruk and Leimar Price (2007), as there was a definite absence of the parental generation due to urbanization. These rural Thai children's early development of local ecological knowledge relied heavily on adult guidance and influences, however later on their development the children were found to interact more with friends and their knowledge was expanded through group play and experimentation (Setalaphruk and Leimar Price, 2007). While HIV/AIDS undoubtedly jeopardises the flow of some forms of trans-generational knowledge, the rural children in these six sites were certainly encouraging the flow of local ecological and agricultural knowledge despite the impact of HIV/AIDS. This means that there is not necessarily a direct loss of skills and experience through this impact, and that certain knowledge and skill pathways may remain open in spite of the effect of HIV/AIDS.



*Figure 5.2: Teenage boys at Nqabara (near Ntubeni) during their initiation ceremony, during which the boys live in a thatched hut called a 'boma' for several weeks, away from their homestead, usually within a forest. Initiates are encouraged to hunt and collect wild foods*

### 5.7. *The commercialisation of natural resources by vulnerable rural children*

In section 2.4.6 the commercialisation of wild foods was addressed. Selling wild foods ranged between 28 % of schoolchildren and 47 % of non-school children. Within the inland sites, the majority of those children selling wild animals and plants to local traditional healers (80 %), while in the coastal areas wild foods were mainly sold to tourists (61 %). Among the inland non-school children, a significantly higher proportion of afflicted children were selling wild foods compared to the non-afflicted children (15 %,  $p < 0.001$ ). There was no data collected on how often children were selling, and what species in particular. However, with the data collected it could be argued that the commercialisation of wild foods by rural children is testament to their resourcefulness and resilience, and that they are active members of the rural economy. Commercialisation of wild foods brings in potentially valuable cash injections into the household, adding to their wellbeing. Shackleton (2005) found that 20 % of those involved in the trade of marula beer (made from the wild fruit of *Sclerocarya birrea*) in the Limpopo province of South Africa were children. While trade can bring in financial income, three young girls in Coffee Bay admitted to trading shellfish and fish for maize meal. Trade of wild foods for other foods, clothes and informal loans have been documented by (Foster, 2005; Ngwenya and Mosepele, 2007). While these small income generating activities are valuable for highly vulnerable children, we need to ensure that the harvesting and marketing of these resources is sustainably managed to ensure future use. We also need to rethink the legislation that governs commercialization of natural resources, and prioritise the rural youth and children when it comes to accessing commercial hunting and fishing permits. In light of the reality that, amidst the slow erosion of rural households from the impact of HIV/AIDS, rural children continue to cope independently even after the household has collapsed, supporting children's independent activities must be a priority of Natural Resource Management (NRM).

### 5.8. *The impact on local biodiversity*

While there are many benefits attained from the use of biodiversity by rural children made vulnerable by HIV/AIDS, we need to consider some of the costs. Is the children's harvesting sustainable? So far there is not enough data to adequately answer this question; however what I have shown is that the majority of the animals and birds harvested by the children were common species and were not threatened according to the IUCN Redlist of Threatened Species (IUCN, 2007). However, there are two species consumed by the children at Coffee Bay and Mabehana that were of IUCN concern: the southern giant petrel (*Macronectes giganteus*) and giant golden mole (*Chrysofalax trevelyani*). We need to clarify our understanding of the impact children are having on these endangered species for

appropriate interventions to be exercised. The children did not select specific terrestrial species but instead randomly harvest any animal that came their way, while they were not selecting specific species and therefore displacing their impact, there is no data on how much children are actually harvesting. Shellfish harvesting however does not occur randomly and specific species are selected. There is very little literature that investigates the impact of HIV/AIDS on biodiversity (Allison and Seeley, 2004; Torell *et al.*, 2006). In Zimbabwe Drimie and Grandure (2005) claim that traditional norms such as preservation of biodiversity, have eroded from the impact of HIV/AIDS, however other political factors could be influencing this 'erosion'. While it is clear that HIV/AIDS is affecting the efficacy of conservation initiatives (Mauambeta, 2003), there is still a need to understand the impact of HIV/AIDS is placing on biodiversity through the use of natural resources by vulnerable rural people. Torell *et al.* (2006), through a investigation into the gray literature surrounding this issue, found that HIV/AIDS directly impacts the harvesting rates of natural resources, as a result of increased dependence on wild foods, wildlife, medicinal plants, timber and fuel wood. They found that there is a trend towards more destructive harvesting practices by AIDS-affected households, particularly in wood cutting and charcoal making (Torell *et al.*, 2006). In section 3.5.2 the personal story of a highly vulnerable teenage boy from Coffee Bay, clearly illustrates Torell *et al.* (2006) argument that AIDS-affected people will increase their dependence on natural resources. While his mother was sick, his father worked in Johannesburg, until he fell sick. His mother passed away, and his father returned home. Having no money the boy and his father began selling fish, mussels and crayfish as well as hunting and collecting wild fruits. The proxy indicators highlighted this household with a high probability of an HIV/AIDS effect, the death and sickness of his parents had directly increased their reliance on natural resources for food and money. In this case (and several others documented in chapter three) the children moved from a subsistence use of wild foods to extraction for commercial gain, which will inevitably increase the amounts of these resources extracted. Another indirect impact on biodiversity is the probability that AIDS-affected communities show less respect to conservation rules and regulations, as they will not be able to receive the long term benefits of these regulations (Torell *et al.*, 2006).

Therefore, any mitigation around wild food harvesting by rural children, would need to create very different management strategies for terrestrial vertebrates, shellfish and fish, and wild plant foods, with specific strategies dealing with the sensitivities around commercialization of these different groups. For NRM to mobilise actions inspired by these findings it will need to investigate the level of the impacts children are having on these resources and surrounding ecology. Secondly, we need to

develop educational programmes for children around specific endangered species, and possibly link NRM initiatives with current environmental education projects such as the Eco-School Program of the Wildlife and Environment Society of South Africa (WESSA). Understandably this will not affect all children, as rural schools are usually difficult to access and high proportions of children do not attend school, particularly those children requiring intervention, i.e. those experiencing an HIV/AIDS impact to their households. A possible way around this problem is to involve rural children in community based NRM initiatives, allowing for youth to participate and contribute to the NRM activities. Children would have much to offer these initiatives as they are actively collecting and using natural resources, and could be contributing more to natural resource use than their adult counterparts (Cloete, 2007). While children are certainly having an effect on local biodiversity, and that this effect may increase as children become more vulnerable to HIV/AIDS, it is essential that children's natural resource extraction is compared to that of adults and to develop interventions or mitigations from these findings. Development practitioners and researchers alike need to reshape children's role in these communities entirely, as this thesis has supported Bourdillon's (2006) argument that children are indeed active agents in their own development.

#### *5.9. Child work in rural areas*

It is a common statement within the western, albeit urban, context that "*children are the future*". Although this may be true, through this research it is clear that rural children in South Africa are not only the future, but are very much the present. It was highlighted in chapter four that rural children played a noticeable role in the local and household economy. Children were observed to market and sell their wild food acquisitions locally, providing direct cash inputs into the household. Their support was not felt directly in financial inputs, but children were observed to regularly bring other resources into the home, such as food, fuel wood, water and medicinal plants (Chapter four). Boys herded cattle; girls managed homesteads, while both girls and boys ploughed fields, planted and watered seeds, harvested vegetables and built fences and homes. The importance and priority placed on their work by the children themselves was surprising, for example the majority of girls went so far as to rank cleaning the household as a more fun activity than play, many girls considered play as a "waste of time".



While child labour is a contentious issue (Bourdillon, 2006) the information gathered in chapter four regarding the services children contribute to the management and maintenance of livelihoods and household economies, seems far more valuable than previously estimated. While child labour laws are enforced to protect children, in some circumstances these laws create further barriers for rural children to engage in their coping strategies. One example comes in the form of a clause found in the recent draft policies for the allocation and management of medium-term subsistence and small-scale commercial fishing rights of the South African Marine Living Resources Act (MLRM), Act 18 of 1998. This clause clearly excludes people under the age of 18 the opportunity to legally acquire a permit to fish and collect coastal resources for subsistence (Raemakers *et al.*, 2007). Supposedly this regulation was created to protect children from labour exploitation. However, considering that children engaging in work are a necessary part of contemporary life in the rural Eastern Cape, a regulation such as this essentially categorises children's coping strategies in the form of shellfish collection and fishing as an illegal activity. Therefore, it is essential to ensure that “safe” and necessary forms of child work, such as natural resource use should not be removed from children's livelihood options, on the suspicion that these activities are exploitative. Bourdillon (2006) takes a critical stance against the discourse on 'abolishing child labour' and questions whether abolishment works in the children's best interests. Bourdillon (2006) argues that we must understand the continuities between the many different stages of childhood and becoming an adult, and we must see children as “*active agents*” in their own development before we create polarised legal frameworks that do not consider children as agents of their own development. There are of course forms of child labour that are more exploitative and dangerous than others, such as sex work, which increases children's vulnerability to abuse and sexually transmitted diseases. Sex work then further weakens a child's ability to cope and therefore is not contributing to the child's overall wellbeing. However, activities such as natural resource collection, are not in the same calibre as sex work, and thus need to be assessed and considered differently, instead of being pooled under the same legal umbrella. The reality is that HIV/AIDS and its adverse impacts on the poor is an exploitative condition. Further reducing children's ability to cope



*Figure 5.3: A young girl at Mabehana carrying thatch grass to her home, with her older sister*



with this condition by creating legal obstacles to their coping strategies, is a futile exercise as it further endangers the wellbeing of the child. We must also consider the reality that children's engagement in natural resource collection and agricultural work within traditional Xhosa society is an accepted cultural norm (Mostert, 1993).

#### *5.10. Possible interventions*

Generally there has been little attention or research into the wild food use by rural people in agricultural and environmental programs (Gari, 2003; Jansen van Rensburg *et al.*, 2004; Keller *et al.*, 2006). This is surprising as Keller *et al.* (2006) discovered that in Tanzania wild traditional vegetables played a more important role in farmer's livelihoods than cultivated vegetables. Indigenous leafy vegetables have been found to play an important part in alleviating hunger and malnutrition in sub-Saharan Africa (Mehendale *et al.*, 2001; Melikian *et al.*, 2001; Beisel, 2002; Jansen van Rensburg *et al.*, 2004). By not prioritizing wild food use in these programs we undermine affordable and practical means for rural people to enhance their food security and therefore nutrition (Gari, 2003). Gari's (2003) suggestion that even children can harvest wild foods if indigenous knowledge is transferred is affirmed by the findings of this thesis. From the data presented in this thesis, the argument can be made that children are harvesting wild foods and relying on indigenous knowledge in this way. Realising this, what interventions are needed now that we know that children rely on these foods during times of crisis?

There is a general urgency in the literature that motivates the need for researchers and development programs to incorporate wild plant foods in responses to nutrition, healthcare and sustainable livelihoods in poor rural areas (Gari, 2003; Frison *et al.*, 2005; Keller *et al.*, 2006). Gari (2003) suggests that the promotion of wild plant foods require parallel support to nutrition education, sustainable natural resource management and food processing and preservation practices, and argues that biodiversity and indigenous knowledge are a valuable agricultural resource available to the rural poor of Africa. These assets are available locally, affordable and versatile, making them an invaluable resource in potentially combating current needs surrounding food production, AIDS mitigation and sustainable agriculture. Similarly Frison *et al.* (2005) suggests that interventions focused on improving the current food, nutrition and health crisis occurring in sub-Saharan Africa, must rely heavily on the revitalization of indigenous and traditional food systems, while simultaneously promoting the sustainable use of biodiversity to increase the availability of food and dietary diversity. Keller *et al.* (2006) argues that we should also incorporate farmer's rationale in deciding to cultivate wild plants,

and choosing the specific species. Thus in the context of rural children's use of wild foods, there is a definite need to incorporate their use of wild plants and animals into intervention programs as well as investigating the processes that govern children's engagement in wild food use.

When considering the range of nutritional and overall health benefits accessed from natural resources by vulnerable rural children in the Eastern Cape; both Frison *et al.*'s (2005) and Gari's (2003) arguments are appropriate. Currently for many rural children in the Eastern Cape, natural resources are some of the only alternatives available to them to improve their diets as their household's ability to secure food for them is weakened by HIV/AIDS. If I found these activities occurring in six separate and very different sites across the Eastern Cape, it is possible that vulnerable rural children in other parts of the country are also relying on wild foods to improve their diets and general wellbeing. Unless the Eastern Cape is atypical, personal observations in other provinces suggest it is not. For example, in Limpopo, van der Waal (2004) recorded children collecting and eating locusts and both Cavendish (2000) and Shackleton (2005) have found children actively engaged in the collection and commercialization of the wild marula fruit.

There is a growing need to broaden our value definitions for natural resources to include natural areas as a valuable storehouse of nutritious food for highly vulnerable children coping with many of the impacts of HIV/AIDS. Rural reconstruction in South Africa and sub-Saharan Africa as a whole will require the support of programs that devote their efforts to mobilize and develop agrobiodiversity and indigenous knowledge (Gari, 2003). Gari (2003) argues that rural youth and children will benefit from such efforts as it will ensure steady access to resources and knowledge needed for them to become good farmers in the future.

Judging from the children's dietary quality, we can assume that the national school feeding schemes are currently not providing enough added food to these children. This needs to be addressed. Children unable to attend school do not have access to these schemes. Therefore, we need to allow children unable to attend school, to still have the option of registering themselves at their closest school for a daily meal, cost free. While the current feeding schemes are not providing what they should be, there is a need for an innovative transformation of these schemes. For example, the development of a community based feeding program that all children have access to.

For those children living in a home that has an AIDS sufferer, working through the home based care

initiative could be a valuable intervention, as has been shown in Botswana (Ngwenya and Kgathi, 2006). Home based care givers could support not only patients, but children within the household as well, with particular emphasis on enriching the children's nutritional intake.

Out of all the children interviewed who did not attend school, 51 % of them claimed they did not attend school because their families could not afford the school fees and 12 % could not afford the uniforms. Considering that many children face a variety of obstacles to attend school in rural areas (such as the need to work at home, herd cattle, plough fields, etc., or perhaps nurse sick family members) obstacles such as uniform and school fees seem completely unnecessary. While children may be made vulnerable from HIV/AIDS, being denied an education in addition to this is unnecessary. Therefore, in light of this we need to lobby for free schooling for all rural schools and the abolishment of financial obstacles to education such as uniforms (or at least make uniforms freely available).

A less formal intervention could be the development of local language educational sheets, regarding key species of nutritional value, their preparation, preservation and storage. These could be distributed on a large scale within rural communities of the Eastern Cape. Within this study it was found that children's diets were severely lacking in animal based protein and green vegetables (see chapter two and four). While we need to develop innovative ways of providing more freely available animal based protein. The distribution of wild plant seeds that are high in protein such as *Amaranthus*, Cowpea, *Cleome*, *Corchorus* and *Solanum* species which contain four times the amount of protein than domestic cabbage (AVRDC, 2007; Jansen van Rensburg *et al.*, 2004). These seeds would be distributed along with the above mentioned educational sheets and could be grown in schools, by home-based carers or the children themselves and could supplement their diets.

These interventions are needed for change within the formal arena as well as within the grass roots programs. A recent study by the National Agricultural Marketing Council (NAMC, 2007) found that in January 2007 people in rural areas had to pay on average R4.01 more for a 5 kg bag of maize meal than people in urban areas. A 7 kg bag of potatoes cost 65% more in October than it did at the same time the previous year. Along with potatoes daily staple food such as cabbage, tomatoes and onions have increased by 10 %. The NAMC (2007) has predicted that this inflation will most certainly increase. With the staple foods becoming even more difficult to obtain by the rural poor due to price hikes, there is a definite need to address food security within these regions. While government is

moving away from subsidizing agriculture they will certainly need to adjust social security to accommodate the inflation of staple foods. Considering there is already a food crisis (described in chapter two and three) among rural children in the Eastern Cape, we need to focus our efforts on developing strategies that ensure children and adults alike have access to a nutritious food in rural areas.

#### *5.11. Opening up participatory research to rural children*

The knowledge regarding the role of natural resources in children's lives made vulnerable by HIV/AIDS was almost non-existent at the beginning of this research project. There were very few case studies that looked at children's independent use of natural resources (van der Waal, 2004; Shackleton, 2005) and almost no literature regarding rural children's independent coping strategies to combat the effects of HIV/AIDS (Foster, 2004). In essence, children had been underestimated as major users of natural resources; their abilities to cope with shock events like HIV/AIDS had previously described children as helpless victims of larger more hopeless situations. The observed reality is considerably different; children are not passive onlookers but adaptive participants. Consequently, we need to allow rural children the opportunity to guide and lead researchers in their research and practices, this can be invaluable in developing locally appropriate research questions that strategically investigate the hidden complexities of rural livelihoods and the impacts of equally cryptic drivers such as HIV/AIDS.

#### *5.12. Conclusions*

While the impact of HIV/AIDS on rural households' ability to access nutritious food resembles a new form of famine in Africa that is endangering the lives of rural children, the situation, while tragic, does not necessarily spell the end for these communities. I have shown that when we move our focus from the household level, and investigate the individual activities of children within their environments, we witness the active transformation of children's lives through their own agency. Through the process of supplementing their diets with wild foods, their nutrition and food security is not only improved, but their emotional wellbeing is also supported. The use of wild foods also preserves vulnerable local ecological/agricultural knowledge through the stimulation of transgenerational communication. Children also increase household economy through the commercialisation of wild foods, as well as supplying households with other valuable natural resources. In essence, natural ecosystems have an even more valuable function in contemporary rural communities, as they are the last form of support for rural children made vulnerable by HIV/AIDS. While this thesis has focused on the resilience of children affected by HIV/AIDS, we should also

remember that many of these strategies apply to all rural children coping with a shock to their household and to their family's livelihood. While HIV/AIDS poses significant threat to rural children, there are many other equally threatening shocks affecting children. The children's lives documented in this thesis within the context of HIV/AIDS induced adversity, reflect the struggle of all rural children dealing with poverty and weakened social capital. As such we need to understand the impact these activities are having on the functioning of these ecosystems, as well as enlightening current development of the value of these ecosystems for vulnerable rural children. Therefore, ensuring that tourism or other forms of development entering these regions consider the value of these ecological systems to vulnerable rural children is essential for sustainable development in the era of HIV/AIDS. I have also argued with support from current literature that we must incorporate the use of wild foods into food and agricultural intervention programmes. We must also redefine how we involve rural children in these programs and how we incorporate these children in our research; as this thesis clearly illustrates that we must not underestimate children's ability to transcend adversity, perhaps more so than adults?

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## *Appendix A*

## Ukutya kwendalo nemibuzo

### School Food & Nature Worksheets

<b>Icandelo loku-1: Inkcukacha ngam</b> <b>Section 1: About me</b>		
Ungubani igama lakho? <i>What is your Name?</i>	Igama: <i>Name:</i>	Ifani: <i>Surname:</i>
Uyafunda? <i>Do you go to school?</i>		
Ufunda phi? <i>Where do you go to school?</i>		
Ufunda Kubani? <i>What grade are you in?</i>		
Uhlala phi? <i>What is the name of the village that you live in?</i>		
Mingaphi iminyaka yakho? (bhala inamba) <i>How old are you? (write the number not the word)</i>		
Uyintombazana okanye inkwenkwe? <i>Are you a girl or boy?</i>		

<b>Icandelo lesi-2: Nditya ntoni</b> <b>Section 2: What I eat</b>				
Utya kangaphi ngemini? <i>How many meals do you have per day?</i>				
Utye ntoni izolo kusasa? <i>What did you eat for breakfast yesterday?</i>				
Utye ntoni izolo emini? <i>What did you eat for lunch yesterday?</i>				
Utye ntoni izolo ebusuku? <i>What did you eat for supper yesterday?</i>				
Ukhe watya enye into ngaphandle kwezi zingentla? <i>Did you eat any snacks yesterday between your meals, except those you listed above?</i>				
Ucinga ukuba kwanele ukutya okufumana kowenu? <i>Do you think you get enough to eat at home?</i>				
Uyitya kangaphi inyama? (yenza isangqa) <i>How often do you eat meat? (circle)</i>	yonk'imihla <i>Every day</i>	elekweveki <i>every week</i>	elekwenyanga <i>every month</i>	ezinye, cacisa <i>other, specify</i>
Uyifumana phi lo nyama? ( yenza isangqa) <i>Where does the meat come from? (circle)</i>	kwizilwanyana zasendle <i>wild animals</i>	uyithenga evenkileni <i>Shops</i>	evenkileni nasendle <i>both</i>	ezinye, cacisa <i>other, specify</i>
Ukutya kanjani ukutya kwasendle? ( yenza isangqa) <i>How do you eat the wild food? (circle)</i>	Ukutya kuluhlaza <i>eat it raw</i>	ukuphekela apho ukufumene khona <i>I cook it where I get them</i>	ukuphekela kowenu <i>I bring them home to cook</i>	ezinye, cacisa <i>other, specify</i>

**Icandelo lesi-2: Nditya ntoni**  
**Section 2: What I eat**

Ukuzingela/ukuloba/ukuqokelela kanjani ukutya kwasendle? ( yenza isangqa) <i>How do you collect/hunt/fish? (circle)</i>	Izinto zokubamba <i>Traps</i>	Ilobo <i>fishing lines</i>	Izandla <i>bare hands</i>
	Umnatha <i>nets</i>	Itolo <i>sling shots</i>	ezinye, cacisa <i>other, specify</i>

**Icandelo loku-3: Ukutya kwasendle**  
**Section 3: Wild foods**

Ukhe uzitye izilwanyana zasendle? <i>Do you ever eat wild animals?</i>	Y	N	ukuba uyavuma, uzityile izilwanyana izolo? <i>If yes did you eat any yesterday?</i> eziphi? <i>What species?</i>	Y	N
Ukhe uyitye inyoka nofudo noxam? <i>Do you ever eat snakes, tortoises or monitor lizards?</i>			iukuba uyavuma, uyityile inyoka nofudo izolo? <i>If yes did you eat any yesterday?</i> Eziphi? <i>What species?</i>		
Ukhe utyitye intlanzi, imbatyisa, imbaza, isagwegwe, iqongwe? <i>Do you ever eat fish or shellfish?</i>			ukuba uyavuma, uyityile intlanzi, imbatyisa, imbaza, isagwegwe, iqongwe izolo? <i>If yes did you eat any yesterday?</i> eziphi? <i>What species?</i>		
Ukhe uzitye iintaka? <i>Do you ever eat birds?</i>			ukuba uyavuma, uzityile iintaka izolo? <i>If yes did you eat any yesterday?</i> Eziphi? <i>What species?</i>		
Ukhe uyitye imifuno yasendle? <i>Do you ever eat wild leafy vegetables?</i>			ukuba uyavuma, uyityile izolo? <i>If yes did you eat any yesterday?</i> Eyiphi? <i>What species?</i>		
Ukhe uwatyie amakhowa? <i>Do you ever eat mushrooms?</i>			ukuba uyavuma, uwatyile izolo? <i>If yes did you eat any yesterday?</i> eziphi?: <i>What species?</i>		
Ukhe uzitye izinambuzane ezinje ngenywa namakulungwane? <i>Do you ever eat insects, like caterpillars or flying ants?</i>			ukuba uyavuma, uzityile izolo? <i>If yes did you eat any yesterday?</i> Eziphi? <i>What species?</i>		
Ukhe uzitye iziqhamo zasendle? <i>Do you ever eat wild fruits?</i>			ukuba uyavuma, uzityile izolo? <i>If yes did you eat any yesterday?</i> Eziphi? <i>What species?</i>		
Ucinga ukuba ukutya kwasendle kunesondlo? <i>Do you think wild fruits are healthy?</i>			ukuba uyavuma, kutheni usitsho? <i>Why do you think this?</i>		
Kutheni uzingela/uqokelela/uloba ukutya kwasendle enje? <i>Why do you hunt/ collect/fish wild foods?</i>			Kungokuba: <i>Is it because:</i>		
			Ulabile <i>Hunger</i>	urhalela ukutya kwasendle <i>I like wild foods</i>	
			ulandela abanye <i>I follow others</i>	ufuna ukukuthengisa <i>I want to sell it</i>	
		uthunywa ngabazali bakho <i>My parents send me</i>	ezinye (cacisa) <i>other (specify)</i>		
Ukhe ukuthengise ukutya kwesendle? <i>Do you sell wild foods?</i>			ukuba uyavuma, Ukuthengisela bani? <i>If yes, to whom do you sell?</i>		

**Icandelo loku- 4: Inkukacha ngempilo yasekhaya**  
**Section 4 : My family's health**

Bangaphi abantu bakowenu? <i>How many people do you live with?</i>	
Bangaphi abantwana abaphakathi kweminyaka eyi-0 uyokuma kweli-18 ? <i>How many children between 0- 18 years live with you?</i>	
Uhlala nabani, ngubani okunakekelayo? <i>Who takes care of you?</i>	
Kukho umntu ogulayo kowenu, uKuba ukhona ixesha lingakanani egula? <i>Is there anyone who is very sick in your home, if yes how long have they been sick?</i>	
Ukhona umntu oswelekileyo kowenu kuleminyaka mibini idlulileyo? <i>Has anyone died in your house in the last two years?</i>	
Ukuba uyavuma, babegula kakhulu phambi kokuba basweleke? <i>If yes, where they sick for a long time before they died?</i>	
Ukhona oswelekileyo kubazali bakho? <i>Have either of your parents died?</i>	ukuba ukhona (thikisha), ngumama wakho [ ] ngutata wakho [ my father ] okanye ngabo bobabini <i>or, both of my parents</i> [     ]

## *Appendix B*

## FOLLOW-UP INDIVIDUAL CHILD SURVEY

Child's reference Number:	Interviewer:		
Date: ___/___/___	Site:	Vulnerability category: (1) (2) (3) (4) (5)	

### Section A: Reference information

1.1. Name of child Respondent:	1.2. Gender:	Male	Female
	1.3. Age:		

2.1. Do you attend School? <i>(circle Yes or No)</i>	Yes	No
	If no, 2.4. Why do you not attend school?	
If yes, 2.2. What is the name of your school?		
	2.5. When did you last go to school?	
2.3. What grade are you in?		

3.1 What do you usually cook with at home? <i>(Circle all mentioned)</i>						
Firewood	Charcoal	Dung	Paraffin	Gas	Electricity	Other:

3.2. Do you have a garden, or access to a garden? <i>(Circle Yes or No)</i>	Yes	No
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3.3. Do you have any livestock at home? How many? <i>(Circle all mentioned)</i>					
Chickens [ ]	Cattle [ ]	Goats [ ]	Pigs [ ]	Sheep [ ]	Other:

3.4. Where do you get your water? <i>(Circle all mentioned)</i>			
tap within homestead	from a community tap	from the river	Other:

### Section B: 24 hour diet recall

4. What did you eat yesterday for breakfast, lunch and supper?

24 Hours	Food and Drink	Bought	Grown	Donated	Gathered	Where?
Breakfast						
Lunch						

Dinner						

**Asking whether they ate some of these foods yesterday**  
(DO NOT READ OFF EXAMPLES! USE TO HELP EXPLAIN!)

- GRAINS and CEREALS** (Examples: Bread, rice, maize products, ujeqe (flour product), corn flakes, cake, porridge, etc.)  
**ROOTS and TUBERS** (Examples: sweet potatoes, beetroots, carrots, onions, etc.)  
**VEGETABLES** (Examples: imifino, spinach, cabbage, broccoli, cauliflower, aubergine, peppers, tomatoes etc.)  
**FRUIT** (Examples: itolofiya, amaqunbe, apples, guavas, oranges, pears, peaches, bananas, paw-paws, avocados, wild fruit etc.)  
**MEAT** (Examples: inyamakazi, intaka, beef, chicken, goat, pork, bushmeat, etc.)  
**EGGS** (Examples: from chickens, from wild birds)  
**FISH and SEAFOOD**  
**GREEN BEANS AND DRIED BEANS AND PEANUTS** (Examples: peanuts, beans, etc.)  
**MILK and DAIRY** (Examples: Amaas, milk, powdered milk (NOT cremora), yoghurt, cheese, etc.)  
**OILS, FATS, and MARGERINE** (Examples: Holsum, sunflower oil, fishoil, Rama, etc.)  
**SUGAR and HONEY** (Examples: sugar, honey, sweets...)  
**DRINKS OTHER THAN WATER** (Examples: Coke, beer, coffee, tea, fruit drink, etc.)  
**UMUTHI** (Examples: traditional medicines)  
**ANYTHING ELSE?**

**Section C: Food Security**

5.1. When was the last time you REMEMBER that you did not have enough to eat? (Circle only one)			
a) Today or yesterday	b) A few days ago	c) More than 2 weeks ago	
d) More than a month ago	e) A few months ago	f) A year ago	g) Never

5.2. On occasions when you were hungry, what did you do? (Circle all mentioned)	
a) Go all day without eating	f) Gather and eat wild foods like imifino or fruits
b) Skip meals during the day	g) Hunt and eat wild animals
c) Serve smaller portions	h) Steal
d) Eat food you do not like	i) Other:
e) Borrow food or go to relatives or friends	

5.3. How often do you eat...			
a) imifino	per	d) birds	per
b) wild mammals	per	e) fish & seafood	per
c) snakes, lizards & tortoises	per	f) wild fruits	per

5.4 How often do you eat uphutu only without anything else? (Circle one only)				
Everyday	2 or 3 days a week	One day a week	One day a month	Never

5.5. How often do you eat meat, chicken or fish?				
Everyday	2 or 3 days a week	One day a week	One day a month	Never

5.6. How often do you eat eggs?				
Everyday	2 or 3 days a week	One day a week	One day a month	Never



5.7. How often do you eat milk amaas or any form of dairy?				
Everyday	2 or 3 days a week	One day a week	One day a month	Never

5.8. How often do you eat vegetables?				
Everyday	2 or 3 days a week	One day a week	One day a month	Never

5.9. How often do you eat fruit?				
Everyday	2 or 3 days a week	One day a week	One day a month	Never

5.10. Who eats first in the household? <i>(Circle one only)</i>						
Youngest Children	Girls	Boys	Grandfather	Grandmother	Father	Mother

5.11. Has your diet always been like this? <i>(If it has improved or got worse, get them to explain how it has changed)</i>

**Section E: Psycho-social information**

6.1. Where are your parents?		
both living in the village	mother alive but not staying in this place	father alive but not staying in this place
fathers deceased	mothers deceased	both parents deceased

*if living with parents, go to 6.3.  
if not living with parents, go to 6.2.*

6.2. Who looks after you?				
Myself	older brother or sister	parents family	unrelated family friend	other:

6.3. What is your favourite thing to do in your day?

6.3. What is the most difficult thing you have to cope with at the moment?

6.4. Further notes <i>(interesting things the child has mentioned)</i>

6.4. Further notes *(interesting things the child has mentioned)*

*After the interview, explain the use of the food diary and how it works, ask if the child would like to take part in the exercise, and give them a book. Make sure they understand how to use the book. Use yesterday's IDDS as an example and go through the book with the child, showing them how to use the stickers. (the food diary, does a 14 day detailed IDDS of domestic and wild food-down to species level, it also collects follow up information on the proxy indicators for HIV/AIDS and there is further space in the book for the children to write about hunting, their diet or home life situation)*

## *Appendix C*