THE RELATIVE CONTRIBUTION OF NON-TIMBER FOREST PRODUCTS, AGRICULTURE AND OFF-FARM SOURCES OF INCOME TO RURAL HOUSEHOLDS IN KOLONI AND GUQUKA, EASTERN CAPE

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A thesis submitted in fulfillment of the requirements for the degree

Master of Science

Rhodes University

November 2014
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ABSTRACT

This study was carried out to determine the contribution of non-timber forest products (NTFPs) to household total income, other livelihood sectors were also examined simultaneously. The contribution of agriculture involved livestock and crop production. Wages and government grants were other livelihood sectors that were looked into. This study was important in determining the change in livelihood strategies in the last decade and to quantify the NTFPs used at the two sites. It was carried out in Guquka and Koloni, both part of the central Eastern Cape. Information on direct use value of the NTFPs used, the quantities and local price; crop production outputs and inputs and the costs. Data were collected via a questionnaire. The sample intensity was 100 %, every household was interviewed. Data was analysed in excel and Statistica 10. All households used at least one NTFP, but their contribution to household total annual income was very low, lowest (4 %) in South Africa and other countries by far. No intense trading was reported at both sites, except for one household in Koloni. The mostly used resources were firewood, fencing poles and plants used for rituals. NTFPs only contributed 3.4% to total annual household income at both sites. There were a few households that used NTFPs extensively, for which they contributed greater than 20 % of the household income. The higher contributions were found amongst the poor household. The low use of wild fruits and vegetables by households at both villages suggested substitution of the wild collected with domesticated variations. Cultivation was practiced in home gardens and at a small scale, consequently crops had a minor (0.7 %) contribution to household total annual income at both sites. Only 59 % were cultivating, across both village and they produced for household consumption. When comparing with 2005 data, cultivation had decreased at both sites. Relatively few household owned cattle (35 %) and they were mainly kept for savings and traditional purposes and were rarely slaughtered or sold at both sites. Only one respondent used cattle for draught but generally they were not. Households also had small stock like goats, sheep, pigs and chickens. Livestock contributed 25 % across sites. Cash income from wages contributed the highest at both sites at 40 %, with government grants being the second contributor at 30 %. Poor households received more government grants. There was a weakly positive relationship between cash income and education. There was no relationship between cash income the use of NTFPs. In conclusion livelihood strategies at these sites were not locally based but were cash based. This is supported by the low use of NTFPs and the minor contribution of
crop production. Households that can afford to purchase do not see the need to collect NTFPs or practice crop production.
ACKNOWLEDGEMENTS

I wish to thank Professor Charlie Shackleton who took me under his wing throughout this degree. He has granted me opportunities that I have never imagined getting in my life, for that I am grateful.

I would also like to thank the department, I have learnt something from everyone. Thank you all for always checking up on my progress and being willing to assist when struggling. To my office mates Craig, Peter, Karabo, Steve and Kyra (YMH), thank you all for the good times and helping me settle in the environment that was new to me.

To my parents, siblings, cousins, my aunt and Elize Cloete, all of you have played a part in my life, without your assistance and love I would not be where I am today. You believed in me even when I did not. I cannot express my gratitude enough. Thank you.

To the families (Mcata and Tobi) that opened their homes to me when I was collecting data, I am thankful. I never felt as an outsider, you treated me like I was part of the family. You showed me that ubuntu still exists. To my field assistants (Lunga Funjwa and Dibanisile Kaka) and the community members of Guquka and Koloni for allowing to help me with my research. Thank you.

The field and bursary costs were provided by the South African Research Chairs Initiative of the Department of Science and Technology and the National Research Foundation of South Africa. Any opinion, finding, conclusion or recommendation expressed in this material is that of the authors and the NRF does not accept any liability in this regard.
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<th>Description</th>
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<tbody>
<tr>
<td>ARC</td>
<td>Agricultural research council</td>
</tr>
<tr>
<td>DEA</td>
<td>Department of environmental affairs</td>
</tr>
<tr>
<td>TEK</td>
<td>Traditional ecological knowledge</td>
</tr>
<tr>
<td>NTFPs</td>
<td>Non-timber forest products</td>
</tr>
<tr>
<td>PCA</td>
<td>Principal Component analyses</td>
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<td>SANAT</td>
<td>South African network for animal tradition</td>
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CHAPTER 1

Introduction

1.1 BACKGROUND

Millions of people throughout the world make extensive use of natural resources. These are commonly termed non-timber forest products (NTFPs) (Shackleton & Shackleton 2004, Schumam et al. 2012). A large body of literature has documented the importance of these NTFPs to the livelihoods of rural households and communities in developing regions, particularly in Africa and Asia (Heubach et al.2011, Albers & Robinson 2013, Angelsen et al. 2014). Babulo et al. (2009) and Tynsong & Tiwari (2012) stated that approximately 80% of rural households in the developing world depend on NTFPs like wild fruits, seeds, poles for construction and medicinal plants to meet subsistence and supplemental income needs, with direct use and consumption being higher than commercialisation (Singh et al. 2010). Subsistence NTFPs may include food (vegetables, seeds, honey, fruit, and meat), medicine, fodder, firewood and building materials for personal or household consumption. On the other hand commercial NTFPs include all the above mentioned for sale either in raw form or after some value addition process (Tragett 2012). Cash poor households use NTFPs to maintain their level of consumption and such use prevents the household from falling into deeper poverty (Shackleton et al. 2007a,Vedeld et al. 2007, Schumam et al. 2012). Bista and Webb (2006), for example, indicated that in India, it was estimated that over 50 million people depend on NTFPs for subsistence and cash income. Use of NTFPs can be on a frequent, often daily basis, or as a fall back during difficult periods (Albers & Robinson 2013, Timko et al. 2010, Awe et al. 2011). Many NTFPs can be harvested, used or traded with little or no investment, other than own labour (Barany et al. 2005). Many NTFPs also have some cultural significance (Shackleton & Shackleton 2003). For example, traditional grass or palm leaf brooms are used in the Eastern Cape, South Africa, as wedding gifts, as protective objects against lightning and as an implement for the application of traditional protective medicine (Cocks & Dold 2004). Collection depends on the family size, alternative income, season and the demand for the NTFP item (Tewari 2012). About 35% of people in South Africa live below the poverty line of R 174 per month, 19% of which live in rural areas (Tewari 2012).
1.2 USES OF NTFPS

Non-timber forest products include all biological materials, except commercial timber, that are found in forests, other vegetation types and even modified landscapes (Delang 2006, Shackleton et al. 2011). Forests, woodlands, grasslands, fields and wetlands provide a wide range of benefits to people, ranging from being a source of agricultural land, to NTFPs, timber and a range of on-site ecological services (Vedeld et al. 2007). Humans have always interacted with their immediate environment and as a result have developed a broad knowledge of useful plants (Scherrer et al. 2005, Dovie et al. 2008, Kar & Jacobson 2012). Rural dwellers can typically name between 150 to 300 plant species that are used regularly in households. Shackleton & Shackleton (2003), for example, reported that communities in the savannas of the Limpopo Province frequently use between 200-300 plant species but those in the Eastern Cape communities use less. Moreover, a single species can have several different uses, for example baobab (Adansonia digitata) is a multipurpose tree with 25 different uses. It is widely used in household construction use, 17 medicinal uses and seven nutritional food uses (Schumam et al. 2012).

The majority of people that use NTFPs live in rural areas, some of which are quite remote (Shackleton et al. 2007a). These rural areas are generally relatively underdeveloped in terms of infrastructure, government services, markets and jobs and hence many areas have disproportionately high levels of poverty (Shackleton et al. 2002). There are few local opportunities and therefore agriculture and natural resources play an important role in the livelihood of rural communities (Shackleton et al. 2002, Twine et al. 2003). Singh et al. (2010) stated that there are households that depend NTFPs as their only livelihood source. Dattagupta et al. (2010) mentioned that 18 % of households in a study carried out in India were totally dependent on NTFPs. In South Africa 85 % or more or households commonly used wild spinach, firewood, wooden utensils, grass-hand brushes, edible fruits and twig hand-brushes (Shackleton & Shackleton 2004) and that over 90 % of rural households in South Africa use at least one NTFP (Shackleton & Shackleton 2004). Use is typically highest amongst the most insecure and vulnerable households (Paumgarten & Shackleton 2011). The use of NTFPs can be categorised into different functions, namely, the daily net, safety-net, cultural use and trade (Shackleton & Shackleton 2004).
1.2.1 Daily net

Some households use NTFPs on a daily basis (daily net) unlike those that use them as a safety net (Cosyns et al. 2011, Ogundele 2012). It is estimated that about 85% of households in rural areas use NTFPs in their daily lives. Amongst the commonly used item are spinach and firewood (Shackleton & Shackleton 2004, Tewari 2012). NTFPs are used daily in all the tropical countries. They provide important resources which the government is not providing for the people (Shit & Patt 2012). This is called, the daily net (Cosyns et al. 2011). Primarily this is the case in households that are trying to save cash and those that have limited access to cash income (Dishan 2010). The ability to collect NTFPs for food, shelter and energy, helps the limited cash resources to be used to secure other livelihood needs that require cash, like education of children or investment in agricultural tools (Uma Shaanker et al. 2004). For example, wild foods are important components to the daily diet and nutritional intake (Setalaphruk & Price 2007, Maroyi 2013). Cash saving is greater in poor households than in wealthier households (Shackleton & Shackleton 2004). Cash saving is not only beneficial at the household level but also at a national level also. About 80% of people in South Africa use medicinal plants for their daily health care because both of cultural preferences and the fact that conventional medicines require money to purchase. In Kwazulu-Natal individuals spent between four to eight percent of their annual income on indigenous medicine (Tewari 2012). Also in many countries extraction and processing of NTFPs provides employment, therefore benefiting the national economy and government (Uma Shaanker et al. 2004).

The range and number of NTFPs used differs between households and communities in response to a number of local and external conditions, such as availability of substitutes, availability of labour to collect, education, income and traditional ecological knowledge (Shackleton & Shackleton 2003). The economic significance of NTFPs as a daily net differs between households with regard to household wealth. The lower the household cash income, usually the higher the dependency on NTFP income (Shackleton & Shackleton 2004, Heubach et al. 2011, Angelsen et al. 2014).
1.2.2 Safety net

NTFPs are often used in response to poverty and misfortune (Babulo 2009, Volker & Waibel 2010, Kar & Jacobson 2011). For example, if the breadwinner loses their job, members of the household may make greater use of wild resources for home consumption or for sale (Dovie et al. 2002). Tewari (2012) reported that in South Africa about 70% of rural households turn to NTFPs as a safety net in times of food shortages, whilst Paumgarten and Shackleton (2011) reported that the safety-net use of NTFPs differed between poor and wealthier households. Other events that may lead to NTFP use as a safety net are droughts, floods, frosts or disease that lead to crop failure or death of livestock, major economic structural adjustment, unanticipated and large increases in costs of staple foods and goods (Barany et al. 2005). For example, a respondent in Ntilini (Eastern Cape, South Africa) said she had to move from town to the village to try make a better living after losing her job (Shackleton & Shackleton 2003).

The use of NTFPs in times of misfortune can take three forms (Shackleton & Shackleton 2004). Firstly, a household may make use of NTFPs that they do not commonly use. For example, collection of poles from a nearby forest for building purposes instead of buying commercial poles or bricks. Secondly, in the face of misfortune a household may increase the consumption of NTFPs that they already use, typically by self collection NTFPs that they had formerly purchased. For example, use of wild fruits or wild spinach, or an increase in use of firewood instead of using paraffin use. The third form is to start trading in NTFPs in local and regional markets, even within communities, e.g. palm brush sellers in King Williams Town (Gyan & Shackleton 2005). This type of increased use of NTFPs is a coping strategy and can be termed an emergency net (Shackleton & Shackleton 2004). Paumgarten & Shackleton (2011) determined that 36% of respondents across two villages had increased their use of NTFPs as a safety-net in the last two years, while 10% were using different kinds of NTFPs and eight percent reported trading in NTFPs in response to a shock.

1.2.3 Cultural uses

NTFPs are used for cultural and recreational purposes, and they offer various opportunities, including cultural maintenance and revival (Cocks et al. 2011, Kar & Jacobson 2011). Some NTFPs are associated with spiritual values, such as communicating with ancestral spirits.
These NTFPs will be protected in a special way so that they can be used during ceremonies. Also some plants are only harvested in times of spiritual needs (Dovie 2003). Kim et al. (2012) stated that the Sts’ailes people, in Canada, made traditional clothing using cedar bark and roots. Branches are also hung on ceremonial houses and are also used as a means of blessing and purification for important ceremonies.

1.2.4 Trade in NTFPs

Non-timber forest product commercialisation is defined as a process of increasing the value of NTFPs so as to increase income and employment opportunities, especially for poor and otherwise disadvantaged people (Ahenkan & Boon 2011). Commercialisation of wild resources is a growing livelihood activity in South Africa (Shackleton & Shackleton 2004). For example, Shackleton (2004) found that no marula beer was sold in local markets in the Bushbuckridge lowveld (Limpopo Province) until 1998, and by 2002 there were over 200 individuals selling it. In Ghana employment generation from NTFP activities was estimated to be growing at 6.9 % per year (Ahenkan & Boon 2011). Ahenkan & Boon (2010) estimated that 20-25 % of the economically active community derive income from NTFPs and 38 % of the households in Ghana trade in NTFPs. Heubach et al. (2011) stated that in Malawi, wild and planted wild fruits trees make up to 15% of total household cash income, whilst Timko et al. (2010) mentioned that in Tanzania more than 50 % of households derive some cash income from NTFPs.

Trade may be small-scale and largely internal within local communities (e.g. Shackleton et al. 2008), or be focused on regional and national markets (Dovie et al. 2002). For example, NTFP markets in Ghana include the immediate village markets, markets within neighbouring villages and local towns, roadside, junction selling points and markets in the nearest large urban centres and cities (Ahenkan & Boon 2011). Similarly Shackleton et al. (2008) described the trade networks and incomes of four different NTFP products in the same region and found the some were sold only within villages or between neighbouring ones, others at local mobile markets in a broader area and more valuable ones were transported over long distances to large towns and cities. NTFP trade generates income and employment for many rural people. The increasing commercialisation is making NTFPs economically attractive (Tewari 2012).
Nonetheless, Shackleton et al. (2007b) in their noteworthy paper commented how much trade in NTFPs still remains invisible to policy- and decision-makers, especially local level trade.

Many households sell NTFPs within their communities, but for some it is a fall back strategy when they are facing financial problems. There is a large number of rural households that buy NTFPs either regularly or during times when they cannot collect for themselves (Shackleton & Shackleton 2004). Poor households engage in selling NTFPs as a means of cash generation (Angelsen & Wunder 2003); more so than wealthier households. The lack of alternative source of income is the main cause (Paumgarten & Shackleton 2009). They also sell different types of NTFPs and the income earned represents a greater contribution to the total household income (Heubach et al. 2011). For example, poor households benefit from NTFP trade than wealthier households, which can contribute, on average, up to 40 % household income (Thondhlana et al. 2012). The lack or limited flow of alternative sources of income for poor households suggests that they gain more than the wealthier households. Although money gained from the trade might be small, it is a source of self-esteem, pride and independence, especially for women (Shackleton & Shackleton 2004). Larger households may earn more income from NTFPs, because they have more labour available (Appiah et al. 2009, Miah et al. 2011).

Income earned from trade differs between NTFPs. For example, hardwood carvers and brush traders earn between R3 000 - R4 000 per year (Shackleton et al. 2007b) and those in the same region that sell softwood craft earned R9000 per annum (Shackleton et al. 2008). Hardwood carvers have difficulty in getting the wood and they have to pay for it, which softwood carvers do not (Shackleton et al. 2008). On the other hand, annual income from selling marula beer was only R500 per annum (Shackleton et al. 2008). This is because sales are limited to only a few months, but the timing of those sales come in a time when money is really needed, such as after Christmas and at the start of the new school year (Pereira et al. 2006, Shackleton et al. 2008).

Although many (but not all) households trading NTFPs remain poor, have limited assets and are unable to acquire certain things for their families (such as higher education for their children), it is important to note that they have managed to secure a living with little or no
external support and that they have pride in what they do (Paumgarten 2005, Shackleton et al. 2008). These represent people who would otherwise be unemployed; therefore it is important not to underestimate the role that NTFPs play in rural livelihoods. For example, Ogundele et al. (2012) found that there are households that are either wholly or partially dependent on the cash income made from the sales of firewood, fruits, vegetables, bushmeat marketing and other forest based activities. Even though they do not do away with poverty they help by providing additional ways of meeting cash needs, such as school fees. The individuals involved in the trade have an independent source of income and they have pride and dignity in being able to provide for their families (Shackleton et al. 2008). NTFP trading can be used to complement existing cash income (Charnley et al. 2008).

Trade may target local, domestic consumers (e.g. brush vendors), nearby urban areas and some tourist markets and retailers (e.g. woodcarvers). Mostly the market chain for rural traders is very simple, the same individual collects the resource, prepares it and sells it. For example, marula beer traders collect the raw material, process it and sell it to customers (Shackleton 2004). Family members may help in preparing the product for selling (Shackleton & Shackleton 2004). Markets are centred within the local village or close by villages and small urban centres (Ahenkan & Boon 2010; Shackleton et al. 2008). Better access to the markets allows increased income from NTFPs (Paumgarten 2005). Rural dwellers that have better access to urban markets trade their resources there and receive higher prices than those that do not have easy access (Paumgarten 2005, Ahenkan & Boon 2010). In Ghana most NTFP traders supply district and urban markets while others bypass markets and sell directly to the local restaurants and local consumers in district capitals (Ahenkan & Boon 2010).

1.2.4.1 Constraints to trade

There are many constraints that producers or traders can be faced with, some are universal to all NTFPs, and some are specific to the type of NTFP being sold. One major constraint is that small, informal sector rural producers do not have access to credit facilities, which is important if they want to grow their business (Pereira et al. 2006, Shackleton et al. 2007b, Shackleton et al. 2008). Wood carvers, for an example, find themselves in situations where they cannot accept bulk orders because of the lack of cash to pay for the products and people to assist in
collection and processing (Shackleton et al. 2008). Another challenge is the lack or insufficient raw material to meet the demand. For some traders seasonality is a challenge, marula beer for an example. Producers have little ability and time for seeking new markets, especially on a larger scale as would be required for national and international markets. Therefore, their market can never grow without external help, like investors (Shackleton & Shackleton 2004).

There is a growing concern regarding overharvesting of some NTFPs, especially those with high or increasing commercial demand (Kar & Jacobson 2012). Unsustainable harvesting of NTFPs can result in stock depletion; this is due to increasing populations and market demand (Arnold & Perez 2001, Kar & Jacobson 2011). On the other hand, Belcher & Scheckenberg (2007) mentioned that commercialisation of NTFPs can create an incentive for the conservation of individually valuable species and its environment. In the case of forest dependent people, it has been argued that NTFP extraction can contribute positively to the sustainability of forests because it provides economic benefits to poor rural communities while conserving biodiversity (Tynsong & Tiwari 2012).

1.3 FACTORS AFFECTING USE OF NTFPS

Use of NTFPs is not uniform and varies within and between households, communities and regions (Angelsen et al. 2014). Understanding the causes of such variation is important in designing appropriate policies or programs. Various factors affect the use of natural resources include, distance from the village to where natural resources are collected, availability of the resource, accessibility, institutional controls, human population densities, employment levels, income levels, availability of alternatives, TEK (traditional ecological knowledge) and personal and cultural preferences (Shackleton et al. 2001, Saha & Sundriyal 2012).

1.3.1 Ethnicity

The usage and importance of NTFPs at household level can be affected by the ethnic group (Uma Shaanker et al. 2004). Ethnic groups differ in their social and cultural backgrounds, regional provenance, history and traditional source of livelihood (agricultural or rural societies)
(Heubach et al. 2011, Thondhlana et al. 2012). Consequently, their knowledge of NTFPs is likely to vary.

1.3.2 Wealth

Wealth is another criterion that influences the use of NTFPs. Poor people are more dependent on NTFPs than wealthier households (Bista & Webb 2006, Thondhlana et al. 2012, Angelsen et al. 2014). However, wealthier sections of the population continue to use natural resources (Cocks et al. 2008, Paumgarten & Shackleton 2009), but may use less, may procure them more through purchase than self-collection, and overall the use of NTFPs represents a smaller proportion of the total household income. However, Shackleton & Shackleton (2006) found that that there was no difference in the total number of NTFPs used for subsistence per household in relation to wealth status. But there was a difference in that households with sufficient income bought NTFPs from their poorer neighbours and vendors instead of collecting from the wild. However, some researchers have found that wealthier households may extract more NTFPs because of better access to the equipment needed for harvesting (particularly transport), storage opportunities, markets and governance institutions who approve harvesting or trade (Heubach et al. 2011, Thondhlana et al. 2012). This is especially so when considering trade in NTFPs.

Typically, wealthier households usually have more power which allows them to influence local restrictions to resource use. If permits are needed it is easier for them to get them. Poor households suffer in cases like these. Wealthier households may exploit the resources for their personal use and may prevent the poor from accessing them and they may change the rules to suit themselves, especially if the tenure is not formal (Paumgarten 2005).

1.3.3 Gender

Gender is a key determinant in shaping the knowledge about plant selection and use in livelihoods (Dovie et al. 2008). Tragett (2012) defines gender as a social construct which results in women occupying positions in society distinct from male counterparts. Women are normally in charge of child care, housework and sometimes animal husbandry. This often means that
their knowledge will only be known to them. As a result of this in many communities and households within a region the knowledge may differ between the genders. For example, Schumann et al. (2012) demonstrated that men knew more about the uses of bark while women knew more about the uses of seeds. There are NTFPs that are labelled as women’s domain when others are known to be controlled by men. Women usually collect NTFPs for the household consumption and trade in products such as reed mats (Timko et al. 2010). Men, on the other hand, usually collect wood for livestock enclosures and poles for fencing and may trade in crafts (Paumgarten 2005, Schumann et al. 2012). Shackleton & Shackleton (2004), for example, mentioned that only men were found harvesting and trading, even though women in the family helped in the processing and preparation for selling of woodcrafts such as furniture and utilitarian items such as bowls, spoons, trays and walking sticks. Ogundele et al. (2012) revealed that women collect vegetables and fruits for household consumption, while males usually hunt or fish. However, the gender patterns reported in such studies may not be the same in a neighbouring or more distant region or country (Sunderland et al. 2014).

In many situations, women are known to be more reliant on NTFPs resources than men (Timko et al. 2010), especially in female-headed homes where women cannot leave the children to look for a job elsewhere (Houehanou et al. 2011). On the contrary, Gyan & Shackleton (2005) found that some female traders leave their families to go and sell their product in bigger towns, e.g. in women selling palm brushes left their families for several days to sell their product in larger urban centres. Men are aware of the use of medicinal plants but women prepare and minister them to the sick and therefore the knowledge remains between them. This knowledge is easily transferred to young girls as they accompany their mothers to collect (Tragett 2012). Men generally collect the economically valuable NTFPs while women are involved only at the local level of use (Tragett 2012).

Women will sell some resources they collect for quick cash for specific reasons, like school fees, but there are others that have created a small business (Shackleton et al. 2001). For example, women dominated in the trade of marula beer in Bushbuckridge, in Limpopo Province (Shackleton et al. 2002). These differences are as a result of the physical nature of the work but also because that is how it has been done in the past (Paumgarten 2005). Dovie et al. (2008) reported that at village level man listed a high number of plants collected for medicine,
fruits, craft wood, housing and fencing poles, whilst woman collected more of firewood and fruits for beverages Gender plays an important role in the trade of NTFPs in rural Ghana. The NTFPs trade is dominated by women. However, the sale of some wild food products such as grasscutters and other products including rattans, bamboo, hides and skins and other wild animal products is dominated by men (Ahenkan & Boon 2011).

1.3.4 Age

Age also affects the type and amount of resources used. There are foods that are normally considered to be children’s food by adults. Young children will collect wild fruits, insects and small mammals while walking to school, herding livestock, or playing outdoors etc. (McGarry & Shackleton 2009). The commercialisation of wild foods by vulnerable children can contribute to their livelihoods. For example, 47 % of children in several Eastern Cape sites were trading in wild foods to supplement their diets (McGarry & Shackleton 2009). In Tanzania, Challe & Price (2009) reported how children in HIV/AIDS affected households were harvesting tubers of wild orchids for both food and for sale. More generally, even though males and older people are generally considered to have more knowledge about the useful NTFPs, variably high levels of knowledge exist within various age and gender categories with regard to the number of plant species (Dovie et al. 2008). Eysaartier et al. (2008) found that mothers are the important transmitters standing at 22 % compared to grandmothers 11 %, eight percent from fathers and grandfathers at three percent.

1.3.5 Location

Villages closer to the resources have easier access. Additionally, better access to the markets allows for greater sales and cash income from NTFPs (Paumgarten 2005). Proximity to forests and to markets has received a lot of attention. Singh et al. (2010) found that households closer to the forest reported higher income from NTFPs. Thus, considering the above mentioned factors the idea that NTFPs are used as largely as a safety net mainly because they are easily available maybe wrong (Paumgarten 2005).
1.4 NTFPS AND OTHER LIVELIHOOD STRATEGIES

The different contributions and importance of NTFPs have been summarised in the sections above. These, however, should be placed in the context of the full range of livelihood options and strategies available to rural people. Most important is that rural people do not earn incomes from just a single source (Cousins 1999, Hebinck & Lent 2007). They usually participate in a lot of different activities which helps optimise income as well as spread risk. In South Africa, most rural communities and households earn incomes from NTFPs alongside income from other sources such as migrant wages, state social grants, petty trading and arable and livestock agriculture (Shackleton et al. 2001, Hebinck & Lent 2009). The proportional contributions of these different income sources has not been well studied in South Africa. Most social science income surveys ignore the contributions from NTFPs, and therefore have (i) underestimated total household income and (ii) overestimated the relative proportions from other sources (Shackleton et al. 2001). The few studies that have calculated incomes from all sources have shown that NTFPs make large contributions, approximately 15 – 25 % of total household income (Shackleton et al. 2001, Dovie 2002, Crookes 2003).

The three studies in South Africa that have determined the income from NTFPs relative to other sources are all over a decade old. But rural livelihoods are dynamic in response to drivers at local and national sales. These drivers can be short-term, requiring livelihoods to rapidly adapt or cope (e.g. in times of drought or prices increases in basic foods) or longer term spanning decades or more (such as the long-term decline in agriculture (Bryceson 2004) or increased state social grants (Hebinck & Lent 2007)). Therefore, more recent studies are needed. Additionally, the political and socio-economic context of South Africa is very different now compared to the time when the data for those studies were collected in the late 1990s. Therefore, a lot can be learnt from repeat studies at the same sites. This was the basis for this research, by examining rural livelihoods and incomes in two villages in 2013, for which data and information also existed from before 2005.
1.5 RATIONALE FOR THIS STUDY

Previous studies have been done at of the two villages on the settlement history, livestock and crop production, land use and so on, but there has not be a study of the value contributed by NTFPs to these household livelihoods and how it compares to other livelihood sources. Therefore, it was important to undertake this study to add to existing information and insights at these long-term research sites. It looked at the contribution of different sectors that contribute to livelihoods to better understand diversification options of income. It was also examined the relative importance of NTFPs to households.

1.6 RESEARCH OBJECTIVE AND KEY QUESTIONS

1.6.1 Objectives

This study had three objectives, i.e.

1. To determine the use of and income from NTFPs at household level in Guquka and Koloni communities and how it is influenced by household and respondent attributes.
2. To examine the contribution of NTFP relative to other income sources.
3. To compare data from work previously done 2005 with the current project in 2013

1.6.2 Key questions

1. To what extent do Guquka and Koloni villagers use and trade NTFPs?
2. What is the contribution of NTFPs to the annual cash and non-cash household income?
3. How do use and trade contribution differ according to households and individual profiles, especially age, gender and wealth?
4. To what extent and how has NTFP use changed through time or in the last 10 years?
1.7 STUDY AREA

1.7.1 Location of the two study villages

This study was conducted two villages, Guquka and Koloni, in Nkonkobe local municipality in the Eastern Cape Province, South Africa. These two villages were used because they have been part of an ongoing research programme spanning almost two decades and summarised by the various authors in the book by Hebinck and Lent (2007). These two villages are part of the small rural areas of the former Ciskei “homeland” now in the Amatole district municipality. The population of the Amatole district municipality is 1.7 million. Alice is one of the main towns of this local municipality, which are Fort Beaufort, Hogsback, Middledrift and Seymour.

The Nkonkobe local municipality has a population of 130 100 people, and 34 890 households. Of these, 26829 are unemployed and 11816 did not go to school. Black people are the majority in this local municipality, at about 94.5 %, with the rest being 4.5 %coloureds, 0.2 % Indian/Asian and 1.0 % whites. These two villages also experienced the population increase due to forced resettlement during apartheid (Nkonkobe Municipality 2010).

Guquka (32º38’54” S, 26º56’29” E) is a small village just outside of Alice and it lies beneath the Hogsback mountains, at an altitude of approximately 720 m above sea level (Figure 1.1). Guquka falls under Ward 10 which has 3461 households (Nkonkobe Municipality 2010). Guquka is located in the upper part of Tyume river valley which forms the western boundary of the village (Figure 1.2). It experiences an average rainfall ranging between 650 mm and 800 mm (Monde 2003, Hlanganise 2010). It has a sub-humid climate although frost is common in winter. It is part of the villages that were formerly occupied by the Makuze tribe which was established in the mid- to late-nineteenth century. Guquka was forced to partake in betterment planning in during the 1960’s. This was a policy to reduce the increasing population in the homelands and associated land degradation. The apartheid government saw this as a threat and used betterment to control the growth of the black population (Bennett & Barrett 2007). The village has about 125 homesteads, with many families being related to one another.
Figure 1.1: Location of Koloni and Guquka (from Hebinck & Lent 2007).

Figure 1.2: Aerial photograph showing the demarcation of Guquka.
Koloni (32º53’30” S, 27º04’38” E) is one of the small villages close to Middledrift town (Fig. 1.3). It is situated in the dry southern part of the Middledrift at about 590 m above sea level. It is close to Pewuleni mission. This village is under Ward 14 which has approximately 1893 households (Nkonkobe Municipality 2010). It has an annual rainfall of 450 mm, and with high evaporation rates it is in a semi-arid climate zone. The household arrangement resembles that of Guquka, with 133 households (Hebinck & Lent 2007). Koloni is one of the several villages that are part of the Magqunukhwebe tribe (Bennett & Barrett 2007). Koloni accepted the betterment plan voluntarily which was implemented in 1955 in this village (Monde 2003). It was used as a pioneer site for the betterment policy which was planned in the late 1930’s and was enforced in the early 1960s by the apartheid government (Bennett & Barrett 2007).

![Figure 1.3: Aerial photograph showing demacation of Koloni.](image)

**1.7.2 Geology and soils**

The greater part of the Tyume catchment in which Guquka is situated is underlain by sandstone and mudstone of the lower Beaufort series. The higher lying grounds are dolerites. Soils derived from dolerites are nutrient rich whereas those derived from Beaufort series are poor. Being in
the upper catchment, slopes are steep and soil erosion is a constant threat. Guquka is dominated by three different types of soils (Hebinck & Lent 2007), namely:

- Rietvlei series soils which are from alluvial and colluvial material, and form level terraces and slopes with uneven micro-relief. The resulting soil is dark brown fine sandy clay loam.
- Soils derived from Beaufort sediments, consisting of dark greyish brown, apedal, fine sandy loam layers that overlie loamy gravel at a depth of 60 cm and 90 cm. The deeper subsoil is mostly a yellowish brown clay or sandy clay with slow permeability. These soils have a wetter moisture regime because of high rainfall efficiency and the nature of the subsoil.
- Soils that are brown fine sandy clay loam overlying gravel, which overlies weathering rock within 60 cm of the surface. Depth is quite shallow making these soils droughty in times of low rainfall.

In contrast the soils at Koloni are underlain by weathered sedimentary rocks, resulting in shallow Glenrosa soils, which merge with deeper Oakleaf soils on the middle slopes. Oakleaf has two types of soils: the first is characterised by a brown B horizon with weak to moderate structure and abundant penetration of roots. The second type has a grey and denser B horizon with limited root penetration. Crop production of these two soils is significantly different. Other soils in the area include (Hebinck & Lent 2007):

- Estcourt type soils occur on steep slope. They are characterised by a sudden transition between sandy topsoil and a clay-like, impervious B horizon. A thin E horizon occurs at the contact between topsoil and B horizon; this is formed by leaching of water flowing over the contact zone.
- Valsrivier soils are mostly common at the foot of the slope where there is deposition of a thick soil mantle.
- Katspruit type soils are found where accumulation of subsurface water and overland flow and poor drainage caused waterlogged conditions.
1.7.3 Vegetation

The central part of the Eastern Cape is biodiverse because four different biomes (forest, savanna, thicket and grassland biomes) intersect in this region. At the village scale, the vegetation of Guquka is varied because of the mountainous terrain results in differences related to altitude and to aspect. The cool, moist areas are dominated by species rich afromontane forests (mixed in with pine plantations for timber) dominated by yellowwoods (*Podocarpus* spp.). The rest of the slopes are grasslands. Because of the high rainfall, the soils are leached and so the grassland is seen as of low nutritional status for grazing animals for most of the year. According to Lent (2007) the dominant species include *Themeda triandra* (which is a palatable species) and *Aristida junciformis* (highly unpalatable). The valley bottoms have more nutritious grasslands. Heavily grazed patches are dominated by low stoloniferous species such as star grass (*Cynodon dactylon)*.

The vegetation around Koloni is very different, appearing as a grassland with scattered thorn trees (mostly *Acacia karroo*). There is strong evidence that the density of *Acacia karroo* is increasing in many of the semi-arid areas of the Eastern Cape. The grassy areas are a lot more nutritious that around Guquka and so better for cattle, especially during the winter. The most common grass species include *Themeda triandra*, *Digitaria eriantha* and several *Eragrostis* species (Lent 2007).

1.7.4 Land use

In the former homeland areas of the Eastern Cape, land is held under communal tenure and a number of different lands uses occur in close together. At each village land is zoned into residential stands and arable fields. The remaining land is managed as communal rangelands for grazing of livestock and collection of NTFPs. Guquka covers an area of 772 ha, of which in 1997 21 % was arable and 75 % was communal rangeland (Hebinck & Lent 2007). The area of Koloni is much larger (1 114 ha), but despite the much lower rainfall, the proportion under arable fields (36 %) in 1997 was a lot great than at Guquka, and that under communal rangelands was lower (59 %). Field size range from one to three ha in size, with the primary cops being maize, intermixed with beans and pumpkins. Many households also maintain a small garden at the residential plot, in which they grow a variety of vegetables (Hebinck & Lent...
2007). Residential land is prioritised over other land uses, usually at the expense of communal rangeland.

1.7.5 Socio-economic profiles

The majority of households in these two villages have several income sources. According to Hebinck and Lent (2007) external sources of income are the main contribution to livelihoods. In Guquka only 10% of the income was derived from the local activities, whereas 90% was from external income. In Koloni about 71% of households derived income from external sources and the remaining 29% was from the local economic activities. State social grants, old age pensions in particular, are the main constituent of income (50% in Guquka) (Monde 2003). These finding made it clear that Guquka is poorer than Koloni. The mean monthly income was R745 in Guquka and R1 021 in Koloni (Monde 2003).

Guquka is highly populated by youth and Koloni by young adults. On average, Koloni residents have a higher level of education than those at Guquka. In Koloni the majority of the population has reached between grades 8 and 10, whereas in Guquka hardly 50% have passed above grade 7. In both villages less than 5% of adults had a higher degree qualification (Monde 2003).

Both villages have a mean number of 6 people per household. In Guquka the size ranged from 1-14 and in Koloni from 1-13. Guquka demographics showed a higher number of females at 51.5% than males at 48.5%, but it was the opposite for Koloni with females stating at 48.2% and males at 51.8%. In Guquka youth (0-19 years old) was the largest group (38%) while in Koloni the largest number (39%) was young adults (Monde 2003). Majority of households were male headed, most (57% in Guquka and 55% in Koloni) of which were pension dependents. Unemployment rate was very high in the study area, with Koloni with the highest at 56% and Guquka at 39%. The youth (20-39 years) were the majority of the unemployed group, with women suffering more than men. There is also a variety of other resources that Guquka and Koloni villagers build their lives upon, kraal manure, veld and forest products and a wide variety of small stock. Like any other village unemployment is a serious issue in these two villages, especially amongst the young people (Hebinck & Lent 2007). Majority of households in Koloni
(53 %) male headed, whereas in Guquka they were female headed (57 %). Household heads had very low levels of education, especially in Guquka. 60 % obtained between standard 6 and 10 in Koloni and in Guquka 69 % only had between standard 1 and 5. Less than 5 % of household heads were employed in Koloni and 6 % in Guquka. Majority were pensioners (55 % in Koloni and 57 % in Guquka).

Surveys were taken in Guquka and Koloni households in 1997 and 2005. The dominant use of rangeland was collection of firewood. The majority of households also collected plants and plant material for rituals and medicinal purposes and for consumption. Firewood consumption in Guquka in 2005 averaged 3,495 kg per household. The reported quantities ranged from 280 kg to 21,840 kg. In Koloni estimates ranged from 625 to 16,200 kg. In Koloni 15 respondents reported purchasing firewood, but there was no report of this in Guquka (Hebinck & Lent 2007).

Collection of thatch grass continue being important in both villages, especially in Guquka where 40 % of homesteads reported such collection in recent years. Thatch grass is often used underneath metal roofs as insulation, because the metals roofs do not have insulation. In Koloni collection of thatch grass is less important. Collection of medicinal plants was most frequent in Koloni than Guquka (Hebinck & Lent 2007).
CHAPTER 2

The role of Non-Timber Forest Products in livelihoods at Guquka and Koloni

2.1 INTRODUCTION

Non-Timber Forest Products (NTFPs) are an important source of livelihoods for millions of people across the world, mostly in rural areas of developing countries (Mulenga et al. 2011, Abdul 2013, Kimaro & Lulandala 2013, Njana et al. 2013, Angelsen et al. 2014). For this reason they have been studied for well over a decade (Thondhlana & Muchapondwa 2013). They include both unprocessed raw materials and consumer products (Melaku et al. 2014). They are defined as all biological materials, excluding commercial timber, that are extracted from natural and modified ecosystems for direct consumptive use by households, marketed or have socio-cultural or religious significance (Mulenga et al. 2011, Cocks et al. 2011, Shackleton et al. 2011). As such, they have a lot of functions, including for food, health, energy, construction materials, tools and weaving fibres (Dattagupta et al. 2010, Timko et al. 2010, Kar & Jacobson 2012, Melaku et al. 2014). Using NTFPs requires knowledge of the resource in terms of its functional use, location, means of harvesting, and the tools and time to access (Abdul 2013).

Benefits from use of NTFPs differ between and with households. Between household differences are a function of socio-economic characteristics like wealth, family size and composition of female and male members in a household, education level, gender and age of the household head (Awe et al. 2011, Asfaw et al. 2013). For example, a household can harvest more resources when having a large number of people living in it due to a greater supply of labour. Collection for a household can also decrease with age, as children grow they move away to start their own households therefore the number of mouths to feed decrease (Thondhlana & Muchapondwa 2013). Poor households are generally presumed to depend more on NTFPs than more affluent ones (Shackleton & Shackleton 2006, Hogarth et al. 2013, Thondhlana et al. 2012, Angelsen et al. 2014), although there are exceptions (Ambrose-Oji 2003). Typically use of NTFPs contributes between 15 – 30 % of household income (cash and non-cash combined), but some studies have shown even higher contributions, such as 46 % in central Zambia (Mutamba 2013) and 64 % in northeast Peru (L’Roe & Naughton-Treves 2014).
Wealthier households have the ability to harvest more resources than the poor ones and they can derive more income when trading (Thondhlana et al. 2012, Thondhlana & Muchapondwa 2013). It is not only household attributes that influence use, but also contextual factors such as access, availability of supply, tenure arrangements and rules, institutional controls and proximity of markets as (Uma Shaanker et al. 2004, Saha & Sundriyal 2012, Thondhlana et al. 2012). Safety concerns are also another factor that hinders collection, especially by females (De Neergaard et al. 2005).

Collection can either be for commercial purposes (income generation) or subsistence use. These resources support human wellbeing in multiple ways and in that way they help reduce poverty as they contribute significantly to household income and food security (Thondhlana et al. 2012). The household income can be in the form of supplements to other livelihood activities or as primary means of cash generation (Abdul 2013). NTFPs can also be used as a safety net or insurance in times of misfortune, such as the death of a bread winner in the household, loss of crop or livestock, unexpected commitments, retrenchment, etc. (Shackleton & Shackleton 2004; Paumgarten & Shackleton 2011, Abdul 2013, Shackleton & Pandey 2014). Households can save cash by using NTFPs as substitutes and in that way the money can be used on other important household needs requiring cash, such as school fees (Asfaw et al. 2013). Consequently, the state would have an increased burden to help the poor if NTFPs were not available.

Commercialisation of natural resources has been reported to a growing phenomenon in South Africa (Campbell et al. 2002, Shackleton & Shackleton 2004, Shackleton et al. 2008). Trade may be small-scale and largely within the local communities (Dovie et al. 2003, Shackleton et al. 2007b), or more regional or international (Shackleton et al. 2008, Cunningham 2011). Some households use trade as a fall back plan, for easy cash or as safety nets (Shackleton & Shackleton 2004). Although for most households the returns from the trade of NTFPs may be small they still provide an important contribution that complements the different livelihood strategies of households (Mulenga et al. 2011). Additionally, for some households income from trade maybe their primary source of cash income (Shackleton et al. 2007a). The local level trade is a means of financial transfers from wealthier households, who buy NTFPs either regularly or
during times they cannot collect to poor ones within the same community (Shackleton & Shackleton 2006).

Although NTFPs contribute to household income in many countries, the contribution differs geographically and socially (Angelsen et al. 2014). For example, the contribution in India was over 50%, whilst in neighbouring in Sri Lanka the contribution was 16% (Melaku et al. 2014). Contribution may also be different in the same country, depending on the regional and local contexts. For example, in South Africa results from a study in Kat River there was a 20% contribution from NTFPs (Shackleton & Shackleton 2006), whereas in Kalahari the contribution was between nine percent and 32% (Thondhlana et al. 2012). However, what is less examined in current NTFP research is (i) why there are such spatial differences within the same country or region (i.e. what are the key contextual attributes that drive such differences)? and (ii) how the contribution of NTFPs changes through time, especially in a country with experiencing rapid socio-economic changes? This chapter therefore reports on objective 1 and 3 of the broader study by examining the nature, volumes and values of NTFPs harvested by households in Koloni and Guquka, and subsequently comparing those data to similar data collected by in 2005, just less than a decade ago, by Paul Hebinck (unpublished data). The objective was to determine the use of and income from NTFPs at household level in Guquka and Koloni communities and how it is influenced by household and respondent attributes.

2.2 METHODS

2.2.1 Data collection

Assessment of direct use value includes an inventory of the NTFPs used, their quantities and their local price. Data were collected via structured and semi-structured interviews using a questionnaire conducted in the local language. The sample intensity was 100 %, i.e. every household was interviewed. The primary respondent was the household head, but in many instances their spouse also participated. The interviews were conducted in a uniform way to give all respondents the same exposure to the questions. The questions gathered information on the NTFPs that were used by the household. This involved the amount used, frequency of use, and longevity of building or construction material (such as fencing poles). Local units of the resources were recorded and later converted to scientific units by weighing 3 - 5 samples
of each. Resources were measured by volume or by absolute numbers (count) where necessary (hand brushes, wooden utensils, poles, sticks). Firewood was measured using headloads and trailer loads. Sticks in the headloads were counted then the number of headloads in a tractor load was counted; giving a figure of 42 headloads per tractor load. Bundles were used as the standard unit for thatch grass. The bundles that were recorded were all estimates of the respondents. For kraal branches a trailer load was used as the standard unit. The different kinds of bushmeat were substituted with the value of domestic cuts from livestock such as beef, chicken and goats because there was no local price on bushmeat because it was not traded. The weight of the carcass was used to estimate that of livestock to help get the price for bushmeat. Few wild edible fruits were available during the time of data collection and were only used by a few households. The unit of use was recorded in “handfuls” because those people that did consume them ate as they collected them in the wild and did not bring them home. These could not be measured because of the time of data collection they were out of season, resulting in being excluded from the calculation. For wild herbs/vegetables, the recording unit was per plastic bag. There was no trade in wild edible herbs and so the price of domestic spinach was taken as a substitute to calculate the value.

2.2.2 Data analysis

Frequencies of households that participated and used each NTFP were calculated. Respondent prices per unit used for those households that could provide a local price and for those who did not know the local price the mean price was applied. In the case of one or two NTFPs where nobody in the village could provide a price, a price from another close by village or town was used, or a replacement value used for the next most similar substitute for which price was known. For long-lived NTFPs (such as construction poles and thatch grass), the calculated value (quantity multiplied by local price) was divided by the number of years the resource lasted before being replaced to provide an annual value. It was difficult to quantify use of medicinal plants and wild fruits. Medicinal plants were used in small amounts, at irregular intervals and across multiple different species, many of which had no local price. Consequently there were not included in the determination of direct-use value per household. Wild fruits were not collected with containers but were eaten from the tree, and so there were too few reliable estimates of quantities used.
No costs were attributed to own labour within the household because of the excess of labour in most households. Costs of implements associated with NTFP harvesting (such as an axe) were negligible when their long longevity was taken into account and the costs distributed across multiple NTFPs.

Data were analysed using descriptive statistics and were presented as means and standard deviations. Since most of the data were not normally distributed a non-parametric test (Mann-Whitney test) was used to determine the differences between means between Guquka and Koloni. Additionally, Chi-Square 2x2 contingency tables were used for comparison of percentage values between the two villages.

2.3 RESULTS

Table 1 presents a summary of the NTFPs used per household in Guquka and Koloni. Firewood contributed the highest direct-use value of all the resources at R1 734 ± 1 892 per user household per annum across both villages. Although bushmeat was not the most used resource, it was the next highest contributor to direct-use value per household per annum standing at R1 550 ± 2 272. The value of kraal branches value was recorded to be R394 ± 478 per user household per annum. In terms of the extent of resource use when looking at both villages, two resources were used by more than 80 % of households, namely fencing poles at 91 % and firewood at 84 % percent. The least used resources, at less than 10 % of households were palm hand brushes at 5 % and bushmeat at 9 %.
2.3.1 Amount and extent of use of specific NTFPs

2.3.1.1 Firewood

Firewood was the second most used NTFP, by 84% of households averaged across both villages. Guquka had slightly more households that used firewood (88%) than Koloni did (81%), although not significantly so ($\chi^2 = 1.87; p = 0.17$). The process of acquiring firewood varied with some households collecting while others purchased either locally or from the neighbouring village. In Guquka, most purchase was from the nearby village, while in Koloni they bought from local vendors, tractor owners or the donkey owner. Households that purchased firewood in Guquka were more (43%) that those in Koloni (29%), meaning the majority in both villages collected their own firewood needs, Koloni at 71% and at Guquka it was 57%. The mean local price at Guquka was R11.3±3.9 per headload compared to R17.9±6.1 per headload in Koloni. The preferred species in Koloni was Mnga (*Acacia karroo*). It was the only species in close proximity to the village as it grew in abandoned fields. In Guquka the preferred species was black wattle (*Acacia mearnsii*), which is an alien invasive species common in the area. The mean number of headloads used per year was 151.1±146.7 per user household in Guquka and 120.0±147.0 per user household in Koloni. The mean annual direct-use value of firewood was R1 643±1 932 and R1 841±1 862 per user household in Guquka and Koloni, respectively.

2.3.1.2 Hand brushes

There was no manufacturing of hand brushes of any kind of in either village. Vendors from other villages came into the village to sell. A variety of hand brushes were used in Koloni, some of which were not used in Guquka, twig ($\chi^2 = 39.52; p<0.0001$) and palm hand ($\chi^2 = 11.64; p<0.001$) brushes. The same applied when it came to grass hand brushes, just over half of Guquka households (59%) used them, while Koloni was at 33% ($\chi^2 = 13.61; p<0.0005$). Grass and twig brushes were the most used by households, at 33% each, with palm hand brushes only at 11%. The mean numbers of palm, grass and twig hand brushes in Koloni were 1.3±0.5, 0.4±0.2 and 1.2±0.5 per user household per year, respectively. The mean number of grass hand brushes in Guquka was 0.4±0.2 per user household. There were different characteristics between the brushes, the ones used to clean indoors were short and small (grass and palm) and the outdoor ones were tall and strong (twig). The mean price of
Table 2.1: The mean amount and direct-use values of NTFPs per household per year (there may be small discrepancies in the values based on method of calculation; unlike superscripts show significant difference between proportions of households using)

<table>
<thead>
<tr>
<th>NTFP</th>
<th>Units</th>
<th>GUQUKA</th>
<th>KOLONI</th>
<th>COMBINED</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>HH use (%)</td>
<td>Mean amount used per yr/ hh</td>
<td>Mean amount used per yr/ hh</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mean price per unit (R)</td>
<td>Annual value per hh (R)</td>
<td>Annual value per hh (R)</td>
</tr>
<tr>
<td>Firewood</td>
<td>Headloads</td>
<td>88&lt;sup&gt;a&lt;/sup&gt; 151.1±146.7 11.3±3.9 1642.9±1932.1</td>
<td>81&lt;sup&gt;a&lt;/sup&gt; 120±147 17.9±6.1 1841.0±1862.6</td>
<td>84 1734.2±1892.2</td>
</tr>
<tr>
<td>Palm brush</td>
<td>Count</td>
<td>0&lt;sup&gt;a&lt;/sup&gt; 0 0 0</td>
<td>11&lt;sup&gt;b&lt;/sup&gt; 1.3±0.5 29.0±24.8 38.2±24.8</td>
<td>5 29.0±24.8</td>
</tr>
<tr>
<td>Grass brush</td>
<td>Count</td>
<td>59&lt;sup&gt;a&lt;/sup&gt; 0.4±11.8 6.6±4.2</td>
<td>33&lt;sup&gt;b&lt;/sup&gt; 0.4±9.4 10.3±11.4</td>
<td>47 8.0±7.8</td>
</tr>
<tr>
<td>Twig brush</td>
<td>Count</td>
<td>0&lt;sup&gt;a&lt;/sup&gt; 0 0 0</td>
<td>33&lt;sup&gt;b&lt;/sup&gt; 1.2±24.3 41.7±34.7</td>
<td>16 34.9±24.3</td>
</tr>
<tr>
<td>Thatch grass</td>
<td>Bundles</td>
<td>49&lt;sup&gt;a&lt;/sup&gt; 43.7±26.9 6.1±6.7 268.4±179.2</td>
<td>16&lt;sup&gt;b&lt;/sup&gt; 18.5±11.0 4.7±98.8</td>
<td>33 41.3±26.6</td>
</tr>
<tr>
<td>Kraal poles</td>
<td>Count</td>
<td>34&lt;sup&gt;a&lt;/sup&gt; 9±14 33±225</td>
<td>75&lt;sup&gt;b&lt;/sup&gt; 3.5±9.2 29.9±3.7 104±286</td>
<td>54 142.7±272.0</td>
</tr>
<tr>
<td>Kraal branches</td>
<td>Trailer loads</td>
<td>39&lt;sup&gt;a&lt;/sup&gt; 6.0±210±775.0</td>
<td>75&lt;sup&gt;b&lt;/sup&gt; 3.0±3.0 203±39</td>
<td>57 735.5±300.6</td>
</tr>
<tr>
<td>Fencing poles</td>
<td>Count</td>
<td>90&lt;sup&gt;a&lt;/sup&gt; 5.0±30±234±821</td>
<td>93&lt;sup&gt;a&lt;/sup&gt; 2.1±2.1 27.2±104.0</td>
<td>91 166.5±630.8</td>
</tr>
<tr>
<td>Bush meat</td>
<td>kg</td>
<td>7&lt;sup&gt;a&lt;/sup&gt; 16.0±126.0±2155±2138.12</td>
<td>12&lt;sup&gt;a&lt;/sup&gt; 6.9±5.0 58.0±34.1 389.8±268.7</td>
<td>9 1095.9±1547.5</td>
</tr>
</tbody>
</table>
palm hand brushes in Koloni was R29.0±24.8 per brush. The mean price per grass brush in Koloni was R26.7±9.4 and R17.6±11.8 in Guquka. For the twig hand brushes the mean price was R34.9±24.3 per brush. The longevity of twig hand brushes per household was estimated to be one year in Koloni. The mean annual direct-use value was R38±25, R10.3±11 and R35±24 per user household for palm, grass and twig hand brushes, respectively. The mean annual value for grass hand brushes was R7.0±4.0 in Guquka.

2.3.1.3 Thatch grass

Approximately 33% of households had thatched structures. There were some households who covered the grass with zinc sheets, making it last longer. The mean number of bundles used was 43.0±26.9 in Guquka and 18.5±0.0 in Koloni per user household per year. Buildings were different shapes but mostly rondavels, a few were square with walls made of either mud bricks, or mud or cement blocks. The mean price per bundle in Guquka was R6.1±6.7 and in Koloni it was R4.7±11.0. Forty-nine percent of households used thatch grass in Guquka of which most (79%) collected their own grass, 16% bought and five percent did both. Koloni had a few households (16%) who used thatch grass. The majority (89%) did their own collection and none of the respondents reported to both collect and purchase. The collection was either by family members or locals that were paid in kind. The difference of proportion using between the two villages (χ²=24.82; p<0.0001) resulted in a far higher mean annual direct-use value in Guquka (R268±179) compared to Koloni (R87±99).

The reported longevity of a thatch roof was estimated to be nine years in both villages. It lasted longer on houses that had the grass covered with zinc sheets. One household reported that their thatched house was more than 10 years old and another said it had lasted three only years, before they recovered it. In Koloni the grass was used under the zinc roof as thermal insulation for the new houses built.

2.3.1.4 Kraal poles

A kraal is a livestock enclosure traditionally made with poles and branches. The stout upright poles at regular intervals provide the rigidity to the structure, between which are stacked thinner branches, usually harvested from thorny species. The mean number of poles used was 9±10.0 at Guquka and 3.0±10.0 in Koloni per user household per year. About 54% of households in both villages used kraal poles. Koloni had the majority of households (75%) that were using
the poles, compared to only 34% of households in Guquka ($\chi^2= 33.89; p <0.0001$). The poles were estimated to have a life span that ranged from one year to more than 10 years. This depended on the species of tree from which the pole was harvested. In Guquka 47% of the households that used kraal poles collected their poles from the forest or an old plantation and 42% purchased from the nearest commercial town, i.e. Alice. A small number of households (11%) did both (bought and collected). The mean price per pole was R33±14 in Guquka and R30±4 in Koloni. On the contrary, the majority of households in Koloni (74%) reported collection of their own kraal poles and only 26% purchased from the nearest town, King Williams Town. The mean annual value was R225±223 per user household in Guquka and R105±283 per user household in Koloni.

2.3.1.5 Kraal branches

Averaged across both villages 57% of households used branches in kraal construction and maintenance. Kraal branches are the thinner packing branches put around the poles when building a kraal for a livestock enclosure. More households in Koloni (75%) used kraal poles than at Guquka (39%) ($\chi^2=26.44; p<0.0001$). In Koloni several households only used branches to build their kraals, although others used both poles and branches. In Guquka some households used zinc sheets, planks or bricks to build their kraal as they were perceived to last longer than the branches. The mean number of trailer loads of branches used per year in Guquka was 6.0±5.0 per user household and 3.0±3.0 per user household in Koloni.

The local way of buying branches was via a tractor owner or donkey owner who charged per load. The majority of households in Guquka collected (96%), while only four percent purchased. The same was reported at Koloni, the majority (69%) collected, 25% bought and only six percent did both. The mean price was R210±155 per trailer load in Guquka and R203±39 per trailer load in Koloni. The mean annual direct-use value of branches for kraals in Guquka was R1 260±775 and in Koloni it was R609±117 per user household.

The longevity of kraal branches ranged from half a year to three years, depending on the type of tree species used. Kolon households used *Acacia karroo* as kraal branches but reported that it decays quickly. For those households that did not own livestock and used the kraal for only rituals and celebrations the longevity ranged from two months to five years.
2.3.1.6 Fencing poles

Fencing poles are those used around fields, the homestead plot or a small cultivated area within the homestead plot. They were the highest used resource in both villages, approximately 91% of households used fencing poles overall, with 93% in Koloni and 90% in Guquka ($\chi^2 = 0.59; p > 0.05$). The mean number of poles used per year was 5.0±10.0 per user household in Guquka and 1.9±2.3 per user household in Koloni. Most poles were purchased rather than collected in both villages. In Guquka only six percent reported collection and 33% bought them, 56% both bought and collected while six percent did not know. In Koloni, 77% of the households had bought their fencing poles, eight percent collected, and 15% did both. The place of purchase was the nearest town which was Alice for Guquka and King William’s Town for Koloni residents. Sometimes poles were bought from nearby villages which had better tree species. The collection site was either a forest or plantation. In Koloni the life span ranged from a year to more than 10 years, although one household had had the same fence poles since 1979. Respondents reported that the fencing poles produced by hardware stores nowadays were not strong enough to last, blaming the poor way they are dipped (creosoted). The mean annual price in Guquka was R30±17 per pole and R27.2±104.0 per pole in Koloni. The mean annual value was R234±821 per user household in Guquka and R64±104 per user household in Koloni.

2.3.1.7 Bushmeat

Across both villages, only nine percent of households used bushmeat. Wild meat was the second least used resource. Respondents preferred chickens or meat from domestic animals, and therefore hunting was not a common practice. However, hunting for large species is illegal and so there may have been some reluctance to admit to hunting. Slightly more Koloni households reported use of bushmeat (12%) than at Guquka (7%) ($\chi^2 = 1.45; p > 0.053$). The frequency of use ranged from once a month to once a year. The most commonly used animal was ‘mvundla’ (hare or rabbit). The mean amount used per year was 16.0±13.9 per user household in Guquka and 6.9±5.0 per household in Koloni. No trade was reported, and therefore there was no local price. Therefore, substitute prices for beef were used and estimated price to be R58±34 per kg in Koloni (R126±51 in Guquka). The mean annual value was R1 408±756 and R616±270 per user household in Guquka and Koloni, respectively.
2.3.1.8 Other resources

Other resources used in the study sites include wild fruits used by 17% of households in Koloni (and none in Guquka), wild vegetables (3%, only in Guquka), wooden utensils, medicinal plants, traditional sticks and ritual plants. A few households used wooden utensils and traditional sticks. The value of plants used for rituals could not be calculated because they were only collected and never sold in the village or nearby villages and towns. There was a high proportion of households using medicinal plants, 53% across both villages, but the value could not be calculated because most could not account for the small amounts used and prices because they collected themselves or someone was asked to collect.

2.3.2 Total NTFP value per household

Figure 2.1 summarises the annual direct-use value of NTFPs per household in Guquka and Koloni. The majority of households in Guquka used less than R 500 worth of NTFPs per year. In contrast, in Koloni most households accrued more than R 2 501 per year. This could be as a result of the kind of NTFPs that are used at Koloni, but also because the amounts used per household were generally higher in Koloni, especially for those the NTFPs that are most commonly used (fencing poles, firewood, kraal branches). Firewood was the highest contributor to the total value, being the highest in Koloni and second highest in Guquka. When a particular resource is extensively used there is often concern about possible over use, but for these two villages it was the case and most NTFPs were deemed to be available in abundance.
The total mean gross annual direct-use value from NTFPs averaged across both villages was R1 891±2 000. This represented approximately three percent of the total household income per year. At Guquka it was R1 851±2 095 and at Koloni it was a bit more at R1 934±1 913 per year, representing 5 % and 3 % of total household income at each site, respectively. The top three resources that had a high contribution to the total gross income were firewood, bushmeat and kraal branches.

### 2.3.3. Changes in prevalence of NTFP use over the last decade

In comparing the proportion of households using various NTFPs in the two villages from this study with that of the unpublished 2005 data of Hebinck, there are some marked differences (Table 2.2). At Guquka the prevalence of use of nine of the 12 NTFPs listed decreased significantly. In comparison, at Koloni, use of only four decreased, four increased and four changed by only a few percent. Considering the two villages together, the proportion of households using specific NTFPs declined for nine of the 12 NTFPs considered. The exceptions were fencing poles, traditional sticks and wooden utensils. Even though there was a net decline for most of the NTFPs, there was still widespread use of most of them, other than wild fruits and vegetables.
2.4 DISCUSSION

Households benefited from a range of NTFPs from the local ecosystems. Every household used at least one or two NTFPs, whether they bought or collected. The mostly widely used NTFPs were firewood, medicinal plants, fencing poles, kraal poles and branches. The high proportion of use indicates that NTFPs are integral in local livelihoods, mirroring the many other studies in South Africa and other developing countries (for example, Shackleton & Shackleton 2004, Twine et al. 2003, Thondhlana et al. 2012, Angelsen et al. 2014). Trading of NTFPs in these two villages was not common, and hence there was relatively limited income from NTFPs trade. Rather, cash incomes were generated usually through wages, salaries and government grants. There was one respondent in Koloni who had donkeys and a cart and therefore used them to collected bulky resources (firewood, poles, kraal material) and sell them to people who could, or preferred, not to collect for themselves.

Many studies that have been carried over the last decade or so show the significant use of NTFPs and their contribution to household income, cash and non-cash (Shackleton & Shackleton 2006, Angelsen et al. 2014). Table 2.3 lists a few examples of studies done in South Africa on the relative contribution of NTFPs to total annual household income, which provide a comparative basis for the results from Koloni and Guquka. These comparative numbers indicate that the proportional contribution to total household incomes at Koloni and Guquka were a lot lower than reported in previous South African studies, which ranged from 9 % to 28 %. It is not clears why this is so. Possible explanations include that (i) there is some difference in the environmental context which influences the abundance of NTFPs, (ii) perhaps it reflects that these two villages are more integrated into the regional economy and so obtain most of their income from cash sources, as salaries or state grants and (iii) this study is more than a decade later than the early studies in South Africa, during which time the national macro
socio-economic situation has changed, especially in terms of growth of the market economy and the pervasiveness of government social grants in rural areas. Hebinck and Lent (2007) describe a long-term trend in both the villages of increasing reliance on cash incomes, from both wages and from government grants, and a decline in remittances and agriculture. It appears that elements of all three of the above explanations may occur and so it is impossible to separate them. In terms of ecological context, these two villages have far less woody resources available than villages in the northern parts of South Africa which are situated in the savanna biome, which is where the early studies were done. Both Koloni and Guquka are closer to small towns than the villages studied by previous researchers. For the last one, despite continuing poverty there has been considerable growth in real household incomes in rural areas of South Africa over the last 10 – 15 years, mainly as a consequence of targeted social grant programmes by the national government (Bhorat et al. 2014). Use of NTFPs could be important...
economically for rural areas but the lack of formal markets and limited value addition to these resources limits their role in the cash economy sector. Firewood was one resource that was collected all year round by most households, other resources like medicinal plants or those used for rituals were only used when needed by the household.

Table 2.3: Contribution proportions of NTFPs to household income from studies around South Africa

<table>
<thead>
<tr>
<th>Rel. contribution to hh income (%)</th>
<th>Study site</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.0</td>
<td>Koloni</td>
<td>This study</td>
</tr>
<tr>
<td>5.0</td>
<td>Guquka</td>
<td>This study</td>
</tr>
<tr>
<td>9.0</td>
<td>Kalahari-Mier</td>
<td>Thondhlana et al. (2012)</td>
</tr>
<tr>
<td>32.0</td>
<td>Kalahari-San</td>
<td>Thondhlana et al. (2012)</td>
</tr>
<tr>
<td>19.3</td>
<td>Thorndale</td>
<td>Dovie (2001)</td>
</tr>
<tr>
<td>22.0</td>
<td>Manganeng</td>
<td>Crookes (2003)</td>
</tr>
</tbody>
</table>

Not only was the percentage contribution low, but so was the mean total annual value per household (R1 891±2 000), which was lower than most other studies from South Africa. Dovie et al. (2005), for example, reported the total value at R4 278 in Thorndale village in Limpopo Province almost a decade ago. Shackleton & Shackleton (2004) provide a summary table of 14 sites around South Africa where the annual direct use value of NTFPs were determined. The mean from those 14 sites was R3 854 per year (a decade ago), just about double what was recorded here. Relative to the values in that table, the annual direct use value from this study was the third lowest. Interestingly, the two lowest were also from the Eastern Cape Province, not all that far from Guquka. This suggests that the Eastern Cape context may have a significant role in the observed patterns and values of NTFPs, with a marked difference in the low contribution of wild foods relative to studies in other provinces. If the values summarised by Shackleton & Shackleton (2004) were adjusted for inflation to current day, then the numbers calculated for Koloni and Guquka would be the lowest recorded so far in South Africa. This could be because people have greater cash incomes from jobs and government grants and can now buy resources from the nearby town and that there is no household trading in any
of the NTFPs. Harvesting of NTFPs was perceived as something practiced by poor households but even households that are not poor used same of the resources. For them they hired someone to collect or purchased, except for collecting plants for rituals.

The four resources that showed the highest proportion of use, more that 60%, were fencing poles (91 %), firewood (84 %), hand brushes (68 %) and medicinal plants (65 %). Although fencing poles had the highest proportion of households firewood was the one that contributed more to household income at R1 734±1 892 per year per household. This study’s proportion is similar to that of Asfwa et al.(2013) from Ethiopia, where 89 % of households used firewood, with a mean value of 2304 Birr (approx. R1 243). Another study in Tanzania also showed that firewood was used by 80% of households (Kimaro & Lulandala 2013) and was a major component of value used (Schaafsma et al. 2014). In my study firewood was also part of the mostly used, similar to Dovie et al. (2001), along with fencing poles and kraal branches. When looking at village level at Guquka the top three used were fencing poles, firewood (88 %) and grass hand brushes (59 %), while at Koloni fencing poles were still the most used (93 %), followed by firewood (81 %) and then kraal poles and branches at 75 %. Firewood was used by most households for cooking even though these two villages have electricity. This is the same as other studies which show it takes a long time for rural households to move from firewood to electricity, mostly because the costs of the appliances are too high, but also from tradition or preference (e.g. Madubansi & Shackleton 2006, Shackleton 2009)). Also during rituals and celebrations firewood was used to cook.

The extremely low reported use of wild vegetables was different to other studies in South Africa. Many previous studies, as reviewed by Shackleton (2003) have shown widespread use of wild vegetables in various parts of South Africa and neighbouring countries (e.g. Ogle & Grivetti 1985, Maroyi 2011, 2013). For example, (Dovie (2001) and Paumgarten & Shackleton (2009) showed that the proportion of households using wild herbs in their two study sites was between 92 % and 100%. Even previous studies in the Eastern Cape have shown high usage. For example, for three villages in the Kat River valley, the proportion of households using wild vegetables ranged between 87 % and 95 %. On the Wild Coast area, Shackleton et al. (2007c) reported a high proportion of households, 92 and 97 % at Ntubeni and Cwebe, respectively. Mulenga et al. (2011) also mentioned that most households in rural areas of developing
countries used wild fruits, wild herbs and insects for direct consumption and sometimes for commercial purposes. In this study only a handful of households mentioned consuming them. This could be because households could purchase resources and they substitute wild herbs with vegetables like spinach and cabbage. Also could be that there factors that differ from place to place and under different ecological conditions.

Although hand brushes were one of the most used resources, they were not collected but purchased at both villages and the people trading with them came from the other villages. Trade in hand brushes made from various materials is common throughout South Africa, including the Eastern Cape (e.g. Cocks & Dold 2004, Gyan & Shackleton 2005, Shackleton et al.2009). In both these villages there was not much trading in any NTFPs; at Koloni only one man with a donkey cart was collecting firewood and kraal materials for other households. There were also two traditional healers (nyanga), but they only provided medicinal herbs upon consultation, i.e. they were not trading the raw resource. There was some trading of firewood in the village neighbouring Guquka, but not within Guquka itself. Thatch grass was mostly used in Guquka (39%), unlike in Koloni (7%). A study by Shackleton et al. (2007c) showed that the respondents in the study site did trade with thatch grass with the neighbouring villages at a price of R0.60 per bundle. In a study carried out at Kat River, which is relatively close to Guquka, Shackleton & Shackleton (2006) reported that 18% of households sold at least one NTFP, and that there was clear difference between richer households (8%) and poorer ones (36%). Wealthy households purchased more NTFPs, both in terms of types and quantities than did poor households (Shackleton & Shackleton 2006). Mulenga et al. (2011) also reported that households purchased more NTFPs as wealth increased. This could explain why households now purchase instead of collecting at these two sites as households are increasingly supported by governmental grants.

Many studies have argued that NTFP harvesting is most prevalent amongst poor households (Angelsen et al.2014). However, the amounts consumed are often greater amongst wealthy households (Ambrose-Oji 2003, Shackleton & Shackleton 2006), although some studies have found no correlation between NTFP income and household wealth status (Asfaw et al.2013). In Tanzania Schaafsma et al. (2014) found that more than 90% of rich and wealthy households
still harvested firewood. The rich households even had higher mean consumption rates of firewood.

Factors that may affect harvesting of NTFPs at these two villages could be distance to resources, safety, time and species availability. There are forests at Guquka but it is not easy to get to them, which could have hindered some people from going to collect. A trip to the forest at the top of the village takes an hour one way. To the forest below the village takes about 30 minutes to walk there, but almost double that on the return trip because of the steep gradient. The third forest was far away, and was not visited by most respondents. At Koloni there are no distinct forest patches but rather subtropical thicket in the valleys and scattered Acacia trees in the numerous abandoned fields. The thicket areas were easily accessible as they were close to the homesteads. Thus, they were frequently used to collect firewood and kraal materials. Other resources, like medicinal and ritual plants or long-lasting fencing and kraal poles, were collected from more distant forests which was not an option for every household, and therefore they were more likely to purchase such requirements. This was not possible for females as crime had increased in the village. Walking alone away from homesteads was discouraged at any time of the day. Shackleton et al. (2002) suggested that the availability of species could be one of the factors that could contribute to the difference of contribution of NTFPs towards household income between the Eastern Cape and Limpopo Province.

It appeared that collection of some NTFPs was not as gender oriented as it used to be. Traditionally it used to be a woman’s job to collect firewood for household use, but in this study young males or household heads also collected as a way to help around the house as most were unemployed. Sunderland et al. (2014) reported that the stereotypes of gender roles in NTFP collection and trade are highly variable between sites and also through time. If the firewood was not collected it was purchased. There are still NTFPs that are solely collected by males, such as kraal material, fencing poles and bushmeat. Ritual plants can only be collected by males, never by a woman. That is part of the belief system of Xhosa people.

Kraal enclosures are not only used to overnight livestock. In the Eastern Cape many households that do not own livestock have them, because a kraal is regarded as a place where
men gathered to talk as required by the Xhosa culture. Cocks & Dold (2006) determined that 84% of households had kraals and only 19% owned livestock. A kraal is an important place to host rituals that are performed by most households. It is also a place where the family can communicate with their ancestors. To perform these rituals each household has their own special plant that they use; plants that the family identifies with. These may be collected by men of the family or a traditional healer, but never by a female. During these rituals every family uses firewood to cook the food and prepared traditional beer.

2.5 CONCLUSION

Harvesting of NTFPs was widespread by households in the two villages. However, the value was low as result of low quantities extracted, low local prices and very limited income from trade in NTFPs. Because of the low direct-use value, the contribution of NTFPs to total household income was small. Additionally, a comparison of prevalence of use to a decade ago, showed that the prevalence of use seems to be declining, quiet rapidly in Guquka and less rapidly in Koloni. Firewood was still widely used, even though the two villages now have electricity. Plants for ritual purposes were also widely used, reflecting the strong cultural links of the Xhosa people to their local environment. Because of widespread poverty and the strong cultural ties, it is probable that use of some NTFPs will persist even if use of others wanes.
CHAPTER 3

The contribution of small-scale farming to household income and livelihoods

3.1 INTRODUCTION

In southern Africa most rural households and communities engage in a wide range of livelihood activities to support their individual and community needs (Dovie et al. 2005, Mutenje et al. 2010). This typically includes a mix of cash and land-based activities. The former includes salaries from part-time or full-time formal employment, casual wage labour, state grants, self-employment, petty trade and perhaps remittances. The latter includes cropping of fields, maintenance of food gardens, collection of NTFPs and husbandry of livestock and poultry. The mix of activities and their relative contribution to household income (cash and non-cash) varies between sites and through time. For example, some rural households and communities earn a significant proportion of income from agriculture, whereas others do not. Additionally, the relative contribution of agriculture is regarded to be in decline in many areas of South Africa, driven by urbanisation, increasing and ubiquitous participation in the formal economy and widespread social support via government grants (Hebinck & Lent 2007, Shackleton et al. 2013), and in many areas is now considered as only a minor contributor to rural livelihoods (Lahiff 2005). The picture regarding diversification from goods and services provided by owning livestock is less clear, although in most settings only a minority of households own large livestock, i.e. cattle (Dovie et al. 2005). In comparison, in less economically developed countries, such as Malawi, subsistence farming is still important in the livelihoods even though most people also earn incomes from non-agricultural activities (Ellis & Freeman 2004, Kamanga et al. 2009). In rural Botswana 50% of households practiced livestock farming and 70% engaged in crop production (Dovie et al. 2005).

Just less than two million households live in the former homeland areas of South Africa, characterised by high human population densities, pervasive underdevelopment and poverty (Shackleton et al. 2001, Baiphethi & Jacobs 2009, Aliber 2011). Because of these the high
human population densities the deep poverty, the role of land and natural resources in livelihoods has been debated. From one perspective, the severe underdevelopment, lack of employment and poverty pushed people to adopt multiple livelihood strategies (Cousins 1999, Mutenje et al. 2010, Motsholapheko et al. 2012). On the other hand, the high population densities and often marginal agricultural conditions over much of South Africa led some researchers to argue that land-based activities did not contribute much to total household income, with the dominant income options being state grants, remittances from urban kin and petty trade (May 2001). With the growing reliance on state grants for cash incomes, Beinart (2001) has described these areas as being dominated by the “pensionariat”. Both perspectives must also be viewed against a backdrop of a long-term trend of diminishing engagement in agriculture in the former homelands (Hebinck & Lent 2007; Shackleton et al. 2013), which has really accelerated since the democratic transition, presumably as a consequence of increased migration to urban areas and increased prevalence of state grants.

Whilst the decline in agriculture as a primary livelihood strategy has been noted by multiple authors, some have argued that it is not a total disengagement with agriculture because in many places livestock are maintained and there has been increased investment in food gardens adjacent to the homestead (McAllister 2000, Fay 2014), i.e. a process of intensification. Crop production in home gardens is considered critical support in times when other livelihood sectors are constrained or fail. Home gardens are much smaller than arable fields and many households have them as they are easier to access and look after (Shackleton et al. 2001, Fay 2014). The main reason for cultivating a home garden is consumption rather than sale (Aliber 2009, Baiphethi & Jacobs 2009). Many households practice intercropping, especially with maize because it is easy to intercrop other crops like legumes, pumpkin and butternuts (Shackleton et al. 2001). This helps provide a variety of produce and also represents a means of reducing risk against failure of a particular crop even if total yield may be affected by competition between different crops (High & Shackleton 2000). A small proportion of crops grown in home gardens may be donated to family, friends or neighbours as some form of kinship and community ties. This may be important in times of need for the other household as the community can help if there was relationship built.
The proportion of households cultivating fields or gardens differs between regions. Baiphethi & Jacobs (2009) showed that there is evidence of under-utilisation of agricultural resources in the former homelands, probably due to urban migration. However, in some areas households that want to increase the land they have access to lease or borrow land from neighbours and often makes payment as a share of produce (Shackleton et al. 2001, Hebinck & Lent 2007). Additionally, the productivity of both homestead gardens and arable land is generally regarded as or presumed to be lower than that of commercial farms. Different reasons may attribute to this: “small cultivated areas, cultural resistance to modern technologies and practices, low input, inefficient practices and use inputs, intercropping, and inadequate capital or access to capita” (Fenwick & Lyne 1999). However, low production is not always the case as McAllister (2000) showed the contribution of crop farming may contribute approximately 16-20% to household total income and Baiphethi & Jacobs (2009) reported that agriculture contributed 15.5% to household income. Thus, although agriculture is not the principal source of livelihood for the majority of households in the former homelands it does play an important role in the sustainability of some households (Lahiff 2005).

In comparison to the variation in arable agriculture, livestock farming was reported to be widespread in the Eastern Cape, albeit with a variation between households and villages (Lahiff 2005). Livestock husbandry yields a range of benefits including milk, meat and draught power and other non-market benefits that cattle provide (Shackleton et al. 2001, 2005). Smaller livestock are kept for meat (consumption or rituals) and cash from selling (Dovie et al. 2005). Overall, livestock play an important role in rural livelihoods, providing a variety of goods and benefits. These include: bridewealth payments, loaning of animals, cooperative ploughing, meat, milk, ding, skins, and hiring out and selling of goods and services (Shackleton et al. 2005, Kunene & Fossey 2006). Poor households gain more benefits from smaller herds than do well-off households, who tend to focus on savings and commercial benefits. Increasing the herd increases the size of the household’s investment portfolio for savings and security(Shackleton et al. 2001, Sikhweni & Hassan 2013). Milk production, mainly for home consumption, is an important function in most areas, as is ‘savings’ in the form of animals that can be sold for emergency cash (Shackleton et al. 2005, Kunene & Fossey 2006). Culturally related functions such as lobola payments and ritual slaughtering vary between regions (Shackleton et al. 2001). Also cattle use for draught and transport may contribute more to the total value but this may
not apply in places where cultivation plays a less important role in livelihoods (Shackleton et al. 2001).

The relative contribution of any strategy to livelihoods and to household income requires knowledge of all the livelihood strategies that a household uses and incomes that a household earns. Consequently, this chapter reports on the extent of engagement of households at Guquka and Koloni in farming and gardening activities so to be able to contextualise the contributions from NTFPs presented in the previous chapter. By doing it addresses objective 2 outlined in chapter 1.

3.2 METHODS

3.2.1 Data collection

Information on crop and livestock production outputs and inputs and the costs allocated to each product was collected through a structured questionnaire during 2013. This was done on a per household basis. Household heads were the main source of information but in cases where they felt they could not do so they delegated someone in the household to be the respondent. A total of 116 households participated, with 59 in Guquka and 57 in Koloni. The minimum time spent at a household was one hour and the maximum was two hours.

Information was captured on the amounts of each crop harvested, and if some was sold, the quality and the local price. In cases where there was no local price for a particular crop, a price from the nearest commercial centre was used as a substitute. The size of home gardens and fields that were cultivated were measured. Data about inputs including seeds, manure, hired labour, pesticides, animal manure and fertiliser were collected. These were totalled to provide production costs per growing season. No costs were attributed to own labour within the household but labour supplied by others was incorporated (Shackleton et al. 2005).

The questionnaire also gathered information on the type of animals owned, number, and benefits the household got from owning livestock and the costs incurred in looking after them.
Information on slaughtering and selling and frequency was gathered to calculate the value per year. Livestock that they owned was considered as savings. Production costs were calculated from money spent on veterinary medicines and paying of a herder, when there was one.

3.2.2 Data analysis

The quantities and direct-use values of crops produced per household were calculated on a household basis. Monetary value was calculated as the product of quantity and local price, with prices obtained from local respondents. Where there was no local price because a product was not sold locally, the price in the nearest village or commercial centre was taken as a substitute. Savings were calculated using the number of livestock, multiplied by mean price, a household owned during the time of the study. To calculate the annual mean value slaughtering and selling, the frequency of doing these was used, also multiplied by mean price. Annual offspring were considered as growth and were added to the stock value. That was totalled up to give the gross income, and then costs of owning livestock were deducted to get net income. This was done for each type of livestock and poultry.

Data were analysed with descriptive statics in Excel and were presented as means and standard deviations. Statistica was used to test the data for normality. Since most of the data were not normally distributed, a non-parametric test was used (2*2 tables) to test the difference between proportions between the two villages.

3.3 RESULTS

3.3.1 Crop production

The mean size of gardens in Guquka was 957 m² per household compared to 615 m² in Koloni, providing a mean across the two villages of 770 m². No fields were cultivated at Koloni and therefore the sizes were not measured. Mean field size in Guquka was 1.75 ha.

Several different types of crops were cultivated and harvested by villagers during the 2013 cropping season mostly in the homestead gardens, and a few fields (Table 3.1). The mean number of types of crops cultivated per household was 4±2 in both villages and it was the same
at Guquka and at Koloni it was slightly different at 3±2 per user household. Potatoes and maize were mainly planted in fields at Guquka. The other crops were found in home gardens only. Fifty-nine percent of households cultivated at least one type of crop, with 67 % in Koloni and 53 % in Guquka. Across the two villages, 41 % of households did not cultivate anything during 2013.

3.3.1.1 Cabbage (Brassica oleracea Capitata group)

Forty-nine percent of households grew cabbage in their last growing season. The mean number of households growing were more or less the same, ($X^2=2.00; p>0.05$), with Koloni having a slightly higher (54 %) proportion of households as compared to Guquka at 44 %. The local mean price per unit was R9.9±0.4 at Guquka and R10.0±0.0 in Koloni. Koloni residents received a higher annual mean value (R218±142.7), than at Guquka (R180.2±97.8). The mean number was 18.3±10.3 per user household in Guquka and 21.8±14.3 in Koloni. This was interesting because Koloni households have smaller gardens than Guquka but they had a higher yield.

3.3.1.2 Spinach (Spinacia oleracea)

Spinach was used instead of wild vegetables (imifino), mixed with cabbage in some instances. Spinach was the third-most cultivated crop by households in both villages with Koloni having slightly more households (54 %) than Guquka (42 %) ($X^2=2.88; p>0.05$). The mean amounts produced were 13.8±5.6 bunches per user household at Guquka, compared to 18.9±11.1 bunches per user household per year at Koloni. The local mean price per bunch at Guquka was R4.9±0.5 and R5.9±0.3 at Koloni. The annual gross direct-use value was R67.6±26.9 in Guquka, R95.8±55.6 in Koloni, and averaged a cross both villages it was R83.6±47.2.
Table 3.1: Proportions and mean value of cultivated crops.

<table>
<thead>
<tr>
<th>Crop</th>
<th>Units</th>
<th>Guquka</th>
<th>Koloni</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HH use (%)</td>
<td>Mean amount produced / season</td>
<td>Mean price (R)</td>
<td>Annual value (R)</td>
</tr>
<tr>
<td>Cabbage</td>
<td>Count</td>
<td>44&lt;sup&gt;a&lt;/sup&gt;</td>
<td>18±10</td>
<td>10±0.4</td>
</tr>
<tr>
<td>Spinach</td>
<td>Bunches</td>
<td>42&lt;sup&gt;a&lt;/sup&gt;</td>
<td>14±6</td>
<td>5±1</td>
</tr>
<tr>
<td>Carrots</td>
<td>Bunches</td>
<td>27&lt;sup&gt;a&lt;/sup&gt;</td>
<td>13±13</td>
<td>6±0</td>
</tr>
<tr>
<td>Beetroot</td>
<td>Bunches</td>
<td>36&lt;sup&gt;a&lt;/sup&gt;</td>
<td>8±4</td>
<td>7±1</td>
</tr>
<tr>
<td>Tomato</td>
<td>Bunches</td>
<td>19&lt;sup&gt;a&lt;/sup&gt;</td>
<td>15±23</td>
<td>6±0</td>
</tr>
<tr>
<td>Onion</td>
<td>Bunches</td>
<td>29&lt;sup&gt;a&lt;/sup&gt;</td>
<td>19±10</td>
<td>8±1</td>
</tr>
<tr>
<td>Potatoes</td>
<td>Bags</td>
<td>47&lt;sup&gt;a&lt;/sup&gt;</td>
<td>10±15</td>
<td>30±2</td>
</tr>
<tr>
<td>Green pepper</td>
<td>Bunches</td>
<td>7&lt;sup&gt;a&lt;/sup&gt;</td>
<td>9±4</td>
<td>6±0</td>
</tr>
<tr>
<td>Pumpkin</td>
<td>Count</td>
<td>17&lt;sup&gt;a&lt;/sup&gt;</td>
<td>27±30</td>
<td>15±0</td>
</tr>
<tr>
<td>Butternut</td>
<td>Number</td>
<td>19&lt;sup&gt;a&lt;/sup&gt;</td>
<td>37±31</td>
<td>8±0</td>
</tr>
<tr>
<td>Maize</td>
<td>Bags</td>
<td>42&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2±1</td>
<td>200±0</td>
</tr>
</tbody>
</table>
3.3.1.3 Carrots (*Daucus carota* Sativus)

About 31% of households grew carrots in their last growing season. Fewer households grew carrots in Guquka (27%) compared to Koloni (35%), although not significantly so ($X^2=1.50; p>0.05$). What was interesting was that Guquka households produced more (13.3±13) bunches per user household than Koloni. Consequently, carrots had a higher mean annual value in Guquka at R79.6±80 than Koloni (R44.5±21.8). The mean local price was R6±0 at Guquka and R5.9±0.3.

3.3.1.4 Beetroot (*Beta vulgaris crassa group*)

Thirty-one percent of households grew beetroot in their gardens; 36% of households in Guquka and 35% in Koloni ($X^2=0.02; p>0.05$). The mean number of bunches per household was higher in Koloni (10.1±6.7) than in Guquka 7.9±4.4 bunches. With Koloni having produced more bunches the value was also higher at R68.8±44.1 and Guquka at R54.4±26.6. The mean prices were not that different, at Koloni it was R6.9±0.3 and at Guquka it was R7±0.9. This crop was the least contributor to household total value at only R60±34 per year per growing household.

3.3.1.5 Onions (*Allium cepa*)

About 37% of households produced onions in their last growing season, with Koloni having significantly more households that grew (46%) than at Guquka (29%) ($X^2=6.17; p=0.01$). The mean number of bunches provided was higher at Koloni at 22.8±32.9 per user household compared to 18.9±9.9 at Guquka. The mean price at Guquka was R8.1±0.9 and Koloni was at R7.9±0.7. The mean value at Koloni was R181±264 and R157±90 per year per growing household in Guquka. Combined, the mean value was R170±201 per year per growing household.

3.3.1.6 Potatoes (*Solanum tuberosum*)

Potatoes were the most widely cultivated crop in both villages at 53%, with Koloni having slightly more (60%) households than Guquka at (47 %) ($X^2=3.40; p>0.05$). Even though this was the case, Guquka had a higher mean number of bags (9.8±14.9) produced per user household and Koloni had a mean number of bags 7.9±0.7 per user household. The mean annual value at Guquka (R296±448) was higher than Koloni which was at R230±206 per year per growing household. The mean price was R30±2 in Guquka and R30±1 in Koloni. Koloni had more households that produced potatoes but Guquka households got more value. Most
households had grown potatoes but the contribution was not as high when looking at both villages R262±345 per year per growing household.

### 3.3.1.7 Butternut (Cucurbita moschata)

Looking at both villages 22 % of households that grew crops reported having butternut in their last harvest, with Koloni having more households (28 %) than Guquka (19 %) (X²=2.25; p>0.05). The mean number of butternuts harvested per user household was 36.7±31.2 at Guquka and 35.4±20.0 at Koloni. The mean price was the same in both villages at R8±0 per unit. These were not traded locally so a commercial price was used to substitute. The mean annual value per growing household was R293±250 at Guquka and R283±160 at Koloni and, R288±197 combined.

### 3.3.1.8 Maize (Zea mays)

Only 32 % of households reported cultivating maize. The majority of households cultivated it in home gardens which were smaller than fields as most did not have fields that were actively used. Guquka had double the proportion (42 %) of households than Koloni (21 %) (X²=10.22; p<0.005). The mean number of bags produced per user household at Guquka was 1.85±1.2 and 0.45±0.1 in Koloni. Maize was not traded locally so a market price was used as R200±0. The mean value per year growing household at Guquka was R370±232 and R90±20. When the two villages were combined it was R301±235 per year per growing household.

### 3.3.1.9 Other

A few other crops were cultivated by a few households. Across the two villages 12 % of households cultivated green pepper, 16 % pumpkin and 17 % tomatoes (Lycopersicon lycopersicum). Peas (Pisum sativum) were cultivated by 3 % of households, cauliflower (Brassica oleracea botrytus group), broccoli (Brassica oleracea italica group) and turnip (Brassica rapus rapifera group) each by 2 % of households. Broccoli, turnip, cauliflower were only grown by one household in Guquka. Lettuce was grown by two households in Guquka and one in Koloni.
3.3.2 Production inputs

Intercropping was a common practice and hence the same plot of crops benefited at the same time from farming practices such as weeding or watering. Planting material was either from last growing season’s harvest, bought or a gift from a local project that motivates households to grow their own crops. Land preparation was carried out using a tractor (for fields), by hand (hoe/spade), cattle for draught (only one household). There were a few (3 %) households that reported use of chemical fertilisers. Pesticides were also used (27 %), the most common one in both villages being Blue Death (a narrow spectrum carbamate). Animal manure for crops was widely used by households across the two sites, 49 % of households in Guquka and 61 % in Koloni. Some also used compost that they prepared; one household had a compost plot in the garden. Overall, the mean total annual costs of inputs in Guquka were R369±362 compared to R132±250 in Koloni and R236±326 across the two villages (Table 3.2).

Table 3.2: Direct-use values associated with crop farming.

<table>
<thead>
<tr>
<th>Village</th>
<th>Gross income/HH (R)</th>
<th>Production cost/HH (R)</th>
<th>Net income/HH(R)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guquka</td>
<td>984±800</td>
<td>369±362</td>
<td>615±745</td>
</tr>
<tr>
<td>Koloni</td>
<td>679±535</td>
<td>132±250</td>
<td>548±595</td>
</tr>
<tr>
<td>Mean</td>
<td>814±677</td>
<td>236±326</td>
<td>577±661</td>
</tr>
</tbody>
</table>

Mean gross income per household from crops was R984±800 at Guquka and R679±535 at Koloni. Guquka households reported higher costs and therefore the net income was not significantly different from that of Koloni, R615±745 and R548±959, respectively. This might be because Guquka had double the number of households that had a negative net income, six households, whereas only three households had a negative net income at Koloni. The benefit to cost ratio was almost double at Koloni (5.1:1) than at Guquka (2.7:1). However, the mean net income from cropping was quite modest, reflecting either lack of interest in cultivating larger areas or significant constraints against doing so.
3.3.3 Changes in the last decade

In comparing the 2013 survey data with the unpublished 2005 data from Paul Hebinck shows some clear shifts in engagement in arable cropping (Table 3.3). Across both villages the proportion of households cultivating both fields and gardens was 3 %, which was the same as
Table 3.3: The proportion of households cultivating each crop and the mean amount of produce in 2005 and 2013.

<table>
<thead>
<tr>
<th>Crop</th>
<th>Units</th>
<th>Guquka HH use (%)</th>
<th>Mean number produced</th>
<th>Koloni HH use (%)</th>
<th>Mean number produced</th>
<th>Combined HH use (%)</th>
<th>Mean number produced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cabbage</td>
<td>Count</td>
<td>54a</td>
<td>44a</td>
<td>16.7±</td>
<td>18.3±</td>
<td>36a</td>
<td>54a</td>
</tr>
<tr>
<td>Spinach</td>
<td>Bunches</td>
<td>52a</td>
<td>42a</td>
<td>13.1±</td>
<td>13.9±</td>
<td>49a</td>
<td>54a</td>
</tr>
<tr>
<td>Carrots</td>
<td>Bunches</td>
<td>46a</td>
<td>27</td>
<td>8.6±</td>
<td>13.3±</td>
<td>15a</td>
<td>35a</td>
</tr>
<tr>
<td>Beetroot</td>
<td>Bunches</td>
<td>35a</td>
<td>36a</td>
<td>8.8±</td>
<td>7.9±</td>
<td>21a</td>
<td>35a</td>
</tr>
<tr>
<td>Tomatoes</td>
<td>Bunches</td>
<td>39a</td>
<td>19</td>
<td>50.0±</td>
<td>15±</td>
<td>33a</td>
<td>16a</td>
</tr>
<tr>
<td>Onion</td>
<td>Bunches</td>
<td>43a</td>
<td>29</td>
<td>15.4±</td>
<td>18.9±</td>
<td>44a</td>
<td>46a</td>
</tr>
<tr>
<td>Potatoes</td>
<td>Bags</td>
<td>61a</td>
<td>47</td>
<td>10.0±</td>
<td>9.8±</td>
<td>49a</td>
<td>60a</td>
</tr>
<tr>
<td>Pumpkin</td>
<td>Count</td>
<td>26a</td>
<td>17a</td>
<td>12.1±</td>
<td>26.7±</td>
<td>28a</td>
<td>16a</td>
</tr>
<tr>
<td>Maize</td>
<td>Bags</td>
<td>56a</td>
<td>42</td>
<td>153.8±</td>
<td>1.85±</td>
<td>21a</td>
<td>21a</td>
</tr>
</tbody>
</table>

51
in 2005 with 6 % in Guquka and zero in Koloni. The proportion of households cultivating gardens in 2013 had increased substantially relative to 2005; in Guquka up from 53 % of households to 94 % and in Koloni up from 51 % in 2005 to 100 % in 2013. Averaged across the two villages the shift was almost double, from 52 % to 94 % of households.

Although there was an increasing cultivation of gardens, when comparing the results from a study done in 2005 with this one, the proportion of households growing several types of crops decreased in Guquka. These were cabbage, spinach, carrots, tomatoes, onion, potatoes, pumpkin and maize (Table 3.3). For five of the nine crops, the decrease was significant. It was interesting to note that amount produced of some of the previously mentioned crops had increased even though there were less households growing. These crops were cabbage, spinach, carrots, onion and pumpkin. The decrease of maize between the two studies was significant; in 2005 the mean number of bags produced per household was 153.8±142.6 and in 2013 it was only 1.85±1.2. The yield for other crops was similar between years except for tomatoes and maize. There may be a lot of reasons for this tremendous change but the ones observed was that households did not use fields like before, most fields were abandoned. Also the elders stated that there was no one to do the work as the youth does not consider cropping as important. Money to buy seedlings was another stumbling block or not having livestock for draught power.

The trend at Koloni was the opposite, with a greater proportion of households now growing most of the listed crops (Table 3.3). These included cabbage, spinach, carrots, beetroot, onion and potatoes. For three of the crops that had increased, the difference was significant. The proportion of households cultivating maize remained the same. The two crops that decreased (tomatoes and pumpkin), also did so significantly. When it came to the yields per household, most households reported higher yields for cabbage, spinach, carrots, beetroot, onion, potatoes, pumpkin. In contrast, the yield for maize had decreased from 146.9±80.7 in 2005 to 0.45±0.1 bags per household. All cultivation in Koloni was in homestead gardens; not one field was cultivated. Some households reported that they did not grow maize at all because of the dry weather and that livestock destroyed produce. According to data received from South African weather services the rainfall was similar between the two years surveyed and therefore it could not be a factor that influenced the decrease in crop production. The total rainfall Guquka
and Koloni in 2005 was 1 265 mm and 508 mm, respectively; while in 2013 it was 1 316 mm and 480 mm for Guquka and Koloni, respectively.

### 3.3.4 Livestock production

About 76 % of households in Guquka owned at least one type of livestock or poultry and in Koloni it was 74 %. Households derived various benefits from owning livestock. These benefits included slaughtering for different reasons (rituals, meat), selling for cash, bridal price, eggs and milk.

#### 3.3.4.1 Poultry

Most households (55 %) had poultry, with a higher proportion at Guquka (63 %) than at Koloni (47 %) ($X^2=10.28; p<0.001$) (Table 3.4). Koloni may have had fewer households owning poultry but they had double the mean number per household at 24±21, with a mean number of offspring 10.8±9.1 during the year of 2013 and a mean price per unit of R59±15. Guquka, on the other hand, had a mean number of 12±13 with 7.3±6 of offspring with a mean price of R49±14. There was no selling of poultry reported in either village. The mean value from slaughtering chickens per year was R483±540 at Guquka, R663±483 at Koloni and R561±520 when combined. Koloni had a higher mean number of chickens per owning household, explaining the high mean value gathered from slaughtering per year. Guquka had a growth value of R244±322 per year, Koloni reasonably having more at R432±534, and R329±438 when combined. Other benefits, in this case being eggs, had a mean value of R603±87 at Guquka, R1 72±1 550 at Koloni. Theft was reported as the primary reason why some households that did not keep poultry.

Net income at Guquka it was R819±824. At Koloni only one household reported production costs at the value of R30 per year, therefore the net income as R1536±1328. The combined mean net annual value was R1 135±1 124.
Table 3.4: Value of existing livestock to owning households (value was livestock number multiplied by price).

<table>
<thead>
<tr>
<th>Livestock</th>
<th>Guquka</th>
<th></th>
<th></th>
<th>Koloni</th>
<th></th>
<th></th>
<th>Combined</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HH</td>
<td>Mean</td>
<td>Mean no. of births</td>
<td>Mean</td>
<td>Mean</td>
<td>Mean</td>
<td>Mean</td>
<td>HH</td>
</tr>
<tr>
<td></td>
<td>owning</td>
<td>no. per hh</td>
<td>in 2013</td>
<td>price per unit (R)</td>
<td>value per hh (R)</td>
<td>owning</td>
<td>no. per hh</td>
<td>in 2013</td>
</tr>
<tr>
<td>Cattle</td>
<td>20&lt;sup&gt;a&lt;/sup&gt;</td>
<td>9.3±7.6</td>
<td>3.6±4.0</td>
<td>7367±</td>
<td>71408±</td>
<td>46&lt;sup&gt;b&lt;/sup&gt;</td>
<td>9.4±</td>
<td>3.3±2.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1105</td>
<td>67222</td>
<td></td>
<td>8.3</td>
<td></td>
</tr>
<tr>
<td>Goats</td>
<td>14&lt;sup&gt;a&lt;/sup&gt;</td>
<td>8.5±5.3</td>
<td>2.3±1.1</td>
<td>1222+</td>
<td>9822+</td>
<td>21&lt;sup&gt;a&lt;/sup&gt;</td>
<td>12+</td>
<td>5.3±3.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>273</td>
<td>4889</td>
<td></td>
<td>6.1</td>
<td></td>
</tr>
<tr>
<td>Sheep</td>
<td>8&lt;sup&gt;a&lt;/sup&gt;</td>
<td>8.6±6.6</td>
<td>4.3±0.6</td>
<td>940±</td>
<td>7460±</td>
<td>11&lt;sup&gt;a&lt;/sup&gt;</td>
<td>25.3+</td>
<td>4.0±3.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>134</td>
<td>4545</td>
<td></td>
<td>28.7</td>
<td></td>
</tr>
<tr>
<td>Pigs</td>
<td>27&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.8±3.7</td>
<td>7.6±4.0</td>
<td>1156+</td>
<td>4438+</td>
<td>25&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2.3+</td>
<td>5.0±0</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>294</td>
<td>4360</td>
<td></td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td>Poultry</td>
<td>63&lt;sup&gt;a&lt;/sup&gt;</td>
<td>7.8±7.6</td>
<td>7.3±6.0</td>
<td>49±</td>
<td>224±</td>
<td>47&lt;sup&gt;b&lt;/sup&gt;</td>
<td>16.5±</td>
<td>10.8±9.1</td>
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<td></td>
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<td></td>
<td>14</td>
<td>316</td>
<td></td>
<td>13.0</td>
<td></td>
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</tbody>
</table>
Table 3.5: The mean values of costs from annual goods and services that livestock provide per household.

<table>
<thead>
<tr>
<th>Live-stock</th>
<th>Guquka</th>
<th>Koloni</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Slaughter</td>
<td>Sale</td>
<td>Growth</td>
</tr>
<tr>
<td>Cattle</td>
<td>3683± 552</td>
<td>3171± 2383</td>
<td>28656± 37470</td>
</tr>
<tr>
<td>Goats</td>
<td>916± 205</td>
<td>627± 376</td>
<td>2434± 1552</td>
</tr>
<tr>
<td>Sheep</td>
<td>940± 134</td>
<td>1000± 0</td>
<td>2300± 2110</td>
</tr>
<tr>
<td>Pigs</td>
<td>4236± 5834</td>
<td>1992± 1257</td>
<td>2916± 5338</td>
</tr>
<tr>
<td>Poultry</td>
<td>483± 540</td>
<td>244± 322</td>
<td>603± 87</td>
</tr>
</tbody>
</table>
Table 3.6: Annual direct-use values associated with livestock per household.

<table>
<thead>
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<th>Livestock</th>
<th>Guquka</th>
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<td>28208±</td>
<td>704±</td>
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<tr>
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3.3.4.2 Cattle

In terms of large stock, cattle were the most common, with 35 % of households across both villages owning some cattle (20 % in Guquka and 46 % in Koloni). The mean number of cattle was 9.3±7.6 per owner household in Guquka which produced a mean of 3.6±4 offspring during the year. The number at Koloni was 9.4±8.3 with a mean of 3.3±2.7 offspring. The mean price at Guquka was a bit higher (R7 367±1 105) than Koloni, which was R6 998±1 066. Given that the price was higher at Guquka and the mean number per household was not significantly different the mean value per year was R71 408±6 722 whilst at Koloni it was R67 072±65780. The mean value from slaughtering per year was R3 683±552 at Guquka and R3 793±1 210 at Koloni, and R3 758±1 041 combined. There were a few households selling cattle which provided R3 171±2 383 and R3 593±2 033 cash income at Guquka and Koloni, respectively. The combined mean value for selling was R3 468±2 105. The offspring were considered growth in this study and they also had value, at Guquka was to R28 656±37 470 and Koloni it was R19 891±20 680 per owning household. The combined mean growth value was R22 023±25 441 per owning household per year. Owning livestock potentially had a lot of other benefits, but in these two villages the only benefits were milk and animal manure, for those that collected their livestock from the fields.

The gross mean value, excluding productions costs, was R27 431±35 354 at Guquka and R28 208±25 758 at Koloni, with the combined value being R27 975±29 040. Owning cattle also had production costs for medicines and other things. The mean annual production costs at Guquka were R555±322 and R704±682 at Koloni. The mean net value for both villages was R27 333±29 044, with Koloni having a slightly higher mean value at R27 530±25 735 and Guquka at R26 876±36 943 per year per owning household.

3.3.4.3 Pigs

Pigs were the second most common with about 26 % of households owning across both villages. At Guquka 27 % of households kept pigs, with the mean number being 3.8±3.7 for pigs and 7.6±4.0 for piglets per year per owning household. At Koloni 25 % of households had pigs with a mean number of adults (2.3±1.3) and 5±0 piglets per year ($\chi^2=0.11; p>0.05$). The mean price per adult pig was R1 156±294 at Guquka and R932±256 at Koloni. The mean value per year per owning household was R4 438±4 360 and R21 93±1 418 for Guquka and Koloni,
respectively. Pigs had the highest mean value from slaughtering per year at R4 014±5 194, with Guquka having a mean value of R4 236±5 834 and Koloni R3 791±4 744. The mean value from selling was R1 874±1 210 when combined, and at Guquka R1 992±1 257 and Koloni at R1 050±0. In Koloni only one household reported selling pigs. In Guquka the value of growth (R2 916±5 338) was a lot higher than at Koloni (R375±1 403) per year per owning household, with the combined value being R1 730±4 157. There were no other benefits that owning households received from pigs.

The net income value was significantly more (R5 129±10 500) in Guquka, with Koloni only at R1 274±4 656 per year per owning household. This is because the gross income value of Guquka was double (R7 657±10 235) that of Koloni (R3 429±4 457) and the production costs were higher at Guquka at R2 522±2 117 and R2 095±1 013 in Koloni.

3.3.4.4 Goats and sheep

Studies have reported that households usually have more small livestock than cattle because they are cheaper to buy. Across the two villages, being only 17 % of households owned goats, 21 % at Koloni and 14 % at Guquka (X^2=1.70;p>0.05). Koloni also had a high mean number per owning household at 12±6.2 with a mean number of offspring produced during the year being 5.3±3.3. On the other hand, Guquka had a mean number of 8.5±5.3 per owning household with the mean number of offspring being 2.3±1.1. The mean price at Koloni was R1 227±137 and R1 222±134 at Guquka. The mean value was significantly different with Koloni having a mean value of R1 3642±8 704 per year per owning household, Guquka only at R7 460±4 545 and the combined mean value at R1 2301±7 402. Once again Koloni had a higher value from slaughtering at R2 574±4 887 per year per owning household, and Guquka only had a mean value of R916±205, combined being R1 794±3 563. The income from sales was not as high as others, R728±432 for Koloni and R627±376 per year per owning household at Guquka. The growth annual value at Koloni was R3 973±4 750, R2 434±1 552 at Guquka. Goats are used for rituals mostly. No value was associated as far as other benefits are concerned.

Households at Koloni had a mean gross income from goats of R5 807±7 332, production costs of R842±818 and a net value of R5 634±7 601. Guquka had a mean net income value at R3 394±1 547, production costs R255±381 and mean gross income R3 586±1 501 per year per owning household.
Sheep were domestic animal least prevalent within the two villages, at only 8% of households in Guquka and 11% in Koloni ($X^2$=0.52; $p$>0.05). Koloni had triple the mean number per owning household at 25.3±28.7, with a mean number of 4±3.7 offspring per year. Guquka had a mean number of 8.6±6.6 per household, and which produced 4.3±0.6 offspring per year. The mean price per sheep was similar between the villages, R940±134 and R992±163 for Guquka and Koloni, respectively. The overall value to Koloni households was R26 150±29 175 per year per user household and in Guquka it was only R7 460±4 545. The mean annual value that came from slaughtering of sheep was R965±152 per year per owning household. Guquka and Koloni mean values were similar, R940±134 and R990±182, respectively. Selling did not happen much in Guquka, as a result only one household reported selling and therefore there was no standard deviation, R1 000±0. On the other hand in Koloni several households sold sheep during the year, with a mean value per year of R362±150. The annual growth value in Koloni was almost twice (R5 083±4 232) that of Guquka which was only R2 300±2 110.

The total mean net annual income was R3 781±3 849, the mean gross income being R4 134±3 880 and the mean production costs were R382±282. The mean net income per year at Koloni was R4 836±4 793, mean gross income R5 219±4 821 and the mean production costs were R393±325. Guquka had a lower mean gross income, R2 867±2 160, with a high mean production cost (R381±246), which resulted into a much lower mean net income when compared to that of Koloni at only R2 549±2 149.

### 3.3.5 Changes between 2005 and 2013

When comparing the data from 2005 to this from this study, the proportion of households with livestock had increased in Koloni (Table 3.7). Cattle, sheep, goats, pigs, donkeys and poultry had significantly increased. On the other hand, in Guquka ownership of the important livestock had decreased, these being cattle, goats and sheep. The others had increased, with two significantly so.
Table 3.7: Comparison of proportions and mean number owned per household between 2005 and 2013.

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<th>Livestock</th>
<th>Guquka</th>
<th>Koloni</th>
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<tr>
<td></td>
<td>HH owning (%)</td>
<td>HH owning (%)</td>
<td>Mean number per hh</td>
</tr>
<tr>
<td>Cattle</td>
<td>51 20</td>
<td>9.6±7.1 9.3±7.6</td>
<td>26 46</td>
</tr>
<tr>
<td>Goats</td>
<td>18 14</td>
<td>12.3±12.2 8.5±5.3</td>
<td>20 21</td>
</tr>
<tr>
<td>Sheep</td>
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<td>8.0±1.7 8.6±6.6</td>
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</tr>
<tr>
<td>Pigs</td>
<td>10 27</td>
<td>3.6±1.9 3.8±3.7</td>
<td>17 25</td>
</tr>
<tr>
<td>Horses</td>
<td>0 2</td>
<td>0 1±0</td>
<td>4 0</td>
</tr>
<tr>
<td>Donkeys</td>
<td>0 0</td>
<td>0 0</td>
<td>0 2</td>
</tr>
<tr>
<td>Geese</td>
<td>0 3</td>
<td>9.3±9.5 5.0±0</td>
<td>7 0</td>
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<tr>
<td>Poultry</td>
<td>41 63</td>
<td>12.5±8.7 7.8±6.0</td>
<td>46 47</td>
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</table>
3.4 DISCUSSION

This study showed that small farming (crop and animal husbandry) values contributed to household income and livelihoods. The mean net annual values of crops and livestock at both study sites (combined) were R577±661 and R17 183±28 351 per household per year, respectively. Thus, the value of benefits from livestock was much higher than those from cropping, due to their higher unit value as well as high numbers per household when all livestock are considered together.

The study demonstrated the diverse crops grown by rural households with potatoes as the one most wildly cultivated. Dovie (2001) mentioned that most studies often omit the consumption of staple crops (in his case, maize) during its green season, which might contribute as much as 50 % of the final value of maize, and this study it may have been omitted because the data was collected during the dry season and respondents only estimated the amounts harvested. Nonetheless, it would have very little influence on the final value, because the yield of maize was less than two bags per household. Another issue was that most returns from livestock were not used, these included manure from cow dung and ploughing of fields using oxen. These were not commonly practiced in this study. The value was combined under other benefits and between the two villages it was R7 743±11 140 per year per user household, Koloni households gained more as they had R13 125±12 572 from these combined benefits and Guquka only had R567±58 per year per household. Poultry also had other benefits other than slaughtering or selling with eggs, which had a total mean value of R603±87, with Koloni having more again at R1 172±1 550 and Guquka with R663±483 per year per owning household.

Shackleton et al. (2001) concluded mentioned that benefits from crop farming and animal husbandry in rural areas usually contribute far less to livelihoods than wages. This study found the same, as crop farming contributed 1 % to household income at both villages. There are other crops whose value could not be calculated because not many households cultivated them and therefore there were no estimates of the mean amount produced or the price. Although even if all the value was included crops would still have a low contribution as not many households cultivated. Only 59 % of households cultivated in the survey season and of those, 97 % cultivated
only their home garden. Only 3 % cultivated a field. Livestock on the other had had a high contribution in 31 % at both villages, which came as a second contributor to total household income after cash. Every possible income coming from livestock was included. In some households production costs were higher than gross income, especially for crops.

3.4.1 Value from crop production

Only about 59 % of households at both villages had cultivated and collected crops during the 2013 season. Crops were harvested at different stages this was dependent on the situation at that point in time. For this reason maize is commonly underestimated. Crops were harvested for household consumption, giving to neighbours or family members, or ceremonies. The amounts harvested helped estimate production for the next season. The combined mean net annual value of crops was R577±661 across the sites, being, R615±745 at Guquka and R548±595 at Koloni per year per growing household. These values were in line with the study that was carried in KwaZulu Natal 1995/96 where the mean value per year was R323 and R971 in two villages (Fenwick & Lyne 1999). Dovie et al. (2005) reported a mean value of R1088 per household, and High & Shackleton (2000) calculated a mean value of R1068 in the same Bushbuckridge region. From the Bushbuckridge region again Shackleton et al. (2001) reported that crops and fruit trees had a value of R6 202 with the relative contribution to total income being 15 %. In this study, the contribution of crops to household income was very low at two percent in Guquka and only one percent in Koloni. It is likely to decline further as the real income from off-farm cash sources increases through time.

The villages could be described as homogenous for consumption of produce as there were no markets at which the crops were sold. Those households that sold on an adhoc basis sold to households who came to them and asked to buy. This agrees with Baiphethi & Jacobs (2009) where it was shown that households cultivating gardens usually did so for consumption and not for sale. Lahiff’s (2005) study in Shixini (Willowvale) also revealed that most produced crops were consumed by the households.
Cultivating of fields had decreased at both sites between 2005 and 2013; only a few households mentioned cultivating their fields. Reasons included lack of draught power, money to start up, not interested, climate change, poor soil types, no fencing to prevent livestock eating crops, fields being too far away and safety (especially for women). Purchasing food from town seemed like a common practice as households receive cash income from government grants. In Koloni one household had been cultivating a field but someone in the village destroyed his crops so he stopped because he lost money. The community did not like him farming because he was working and had a large herd already.

According to Hebinck & Lent (2007), working in the same two villages, the following reasons were reported regarding the decline in cropping: (i) water problems - limited rain caused crop failure and households were averse to invest in fields in fear of the crops failing, especially in Koloni which had low rainfall and poor ground water quality. (ii) poor soil quality - in Guquka soil used to be fertile and suitable for cropping, high in water and nutrient retention. But the loss of top soil due to erosion was a limiting factor which resulted in lowered crop yields. (iii) a lack of knowledge of how to replenish nutrients to keep the soil fertile was another limiting factor. In 2005 the soil was tested and the results showed that almost half of arable land was not suitable for crop production at both sites. (iv) disinterest – many households did not see agriculture as an activity to invest in, and they would rather purchase foods in neighbouring towns. In this case state transfers and remittances were important sources of income. Older respondents mentioned that the decrease in crop production was related to education received by the youth and migration to find work after finishing school. On their return to the village they were disinterested in agriculture because they lacked the knowledge of how to crop. Elderly respondents in Shackleton et al. (2013) stated similar sentiments. So the youth that were unemployed depended on old people’s pension money, which made it difficult for pensioners to continue cropping as the money was needed by the household for support. Fay (2014) offers a slightly different perspective, although he too found that cropping of fields had declined. He argued, however, that this had been mitigated a bit by intensification of production in the homestead gardens. My results support that to some degree, but the amount produced in home gardens does not equal what is not longer produced in fields. Shackleton et al. (2013) also reported some respondents indicating that diets were changing and the preferred foods, such as rice and wheat bread, could not be grown locally.
3.5.3 Value from livestock production

Several types of livestock were owned by Guquka and Koloni households, including cattle, goats, sheep, pigs and poultry. The mean net value from consumptive goods and services (i.e. excluding savings represented by capital value of stock and heard growth) was substantial, i.e. R11 165±25 985 at Guquka and R23 501±29 659 at Koloni per year per household. Cattle had the highest contribution to livestock income, followed by goats. Pigs and sheep were important to a minority of households. Poultry were common and offered significant cash saving to household through the provision of eggs and meat.

Across both sites approximately one-third of households (35 %) owned cattle. This is similar to findings elsewhere in South Africa (Cousins 1999, Shackleton et al. 2001, Dovie et al. 2005, Shackleton et al. 2005, Dovie et al. 2006). However, the comparison between 2005 and 2013 show that the proportion of household with cattle is not static. There was a large increase in Koloni, from 26 % to 46 %, and an even larger decrease in Guquka, from 51 % to 20 %. There was not much change in the mean number of animals owned. Cattle were not used for draught as the majority of households did not cultivate fields. Also tractors were used because it was easier. Only one or two households reported using cattle to collect kraal material. Most households did not herd their cattle on a daily basis from the grazing fields unless there was an animal needed for slaughtering or selling. They were also collected during dipping day. Only a few were keeping livestock at home and received other benefits like cow dung, manure and milk. Amongst the reasons for keeping livestock, use for lobola was not as important as Shackleton et al. (2005) had reported in a study carried out in Sand River. According to Shackleton et al. (2001) the most important reasons for keeping livestock were for ploughing, followed by milk, savings and live sales. Looking at the reasons provided by studies in different regions it was clear that reasons for keeping livestock differed from region to region.

Goats, sheep and pigs were mainly kept for meat consumption and traditional ceremonies, and not for sale. But occasionally they were sold either slaughtered or alive. Different results were reported by Shackleton et al. (2005) at Sand River whereas about 67 % households sold goats to earn cash. Goats and sheep were sold live but pigs were sold after slaughtering because they
generated more value. Contrary to the results from Thorndale (Dowie et al. 2005) where getting meat from goats was the most important reason for keeping livestock, ceremonies followed. Another study at Sand River showed meat was the first important (97 %) followed by ceremonies (85 %) and celebrations (83 %). In this study cattle were rarely slaughtered, when done it was for traditional ceremonies and celebrations. No cattle meat was shared with other households or given as a gift, this was only done with pigs. It has been mentioned that cattle provide many goods and services (Shackleton et al. 2001, 2005), but in this site the only other benefits received from owning livestock were milk and animal manure and the milk was only in Koloni. This was different to the findings from Thorndale where milk had a high contribution to households at R4 170 for 67 % of households owning, as it had been reported as making a significant contribution to livestock total value (Dowie et al. 2005). Also Shackleton et al. (2001) reported milk was the second highest value at R2 105 per year. After savings, live animal sales amounted to R5 250. In Sand River the most important reason (using scoring) for keeping cattle was cash sales (76 %), savings (93 %), ploughing, ritual, meat, milk, manure, celebrations and lobola (45 %). It would seem cattle were more important to Sand River households than they were in this study. Livestock used to be very important for lobola but not anymore, with a gradual change to cash.

In 2005, 76 % of agricultural income came from livestock. The shift of livelihoods away from agricultural production signified the transformation of households from being locally based socio-economic units to multi-local units of production and consumption. The change had not affected the traditional cultural role of cattle and land in rural life styles as the village area was the source of social cultural identity (a place to retire or hold cultural activities) (Hebinck & Lent 2007). Savings were the highest component of livestock. However, this is not without risk, because of the possibility of theft, disease or death if a drought. Theft of livestock is common in many parts of South Africa as commented by Shackleton et al. (2005), Kunene & Fossey (2006) and Sikhweni & Hassan (2013). It was suggested by Shackleton et al. (2013) that deagrianisation of rural communities in South Africa is most advanced in the Eastern Cape. As a result, the contribution of land-based activities, including the use of wild resources, has diminished, a trend also commented on by Hebinck & Lent (2007). However, a recent study in the Eastern Cape, found that households that do not practice farming still used NTFPs. They collected them from used and abandoned fields, the forest, and surrounding grasslands (Shackleton et al. 2013).
Although the cost:benefit ratio was negative for a few households it was generally positive for both crops and livestock. However, it was significantly higher for livestock (24.5:1) than for crops (3.4:1), representing a better return on investment. Indeed, if own labour was included, then crops would generally be negative.

3.5 CONCLUSION

This study has shown that savings and direct-uses values of livestock are of significant importance. Livestock had a significant contribution to total household income 31 % while crops were the least contributors at one percent in both villages. The most important benefit from was savings resulting from herd growth followed by cash uses, rituals and the celebrations. Although many households do not use some of the several potential goods and services that livestock provide, they appreciated having that option. An example would be that most households do not slaughter or sell but they would if the need arose. Reason could be that there are always rituals during holidays at different households so meat is freely available to the community.

Goats were kept for rituals and cash sales when needed. On the other hand, households only kept sheep for consumption at celebrations because they are not used for rituals and were rarely sold. Furthermore, households that cultivated were more interested in consuming their produce than selling. There were challenges to households cultivating, including expenses for seeds and livestock destroying crops. Cultivating crops was done for extra food for the household. Cabbage and spinach were substitutes of wild vegetables as households did not collect from the wild as they used to. Purchasing of food from shops or towns was common. Some blamed the climate for not cultivating, saying that it was hot all the time so their crops dried up. This was a common in Koloni. A few households cultivated crops as a hobby, this is so because they could afford to purchase but preferred fresh vegetables and had the money to pay for assistants. Normally these households also had a large herd so they had cattle for draught power when needed. There was a diversity of crops cultivated but the yields and number of households growing showed that this sector was not performing well. It is evident that cultivating fields is a declining practice at Guquka and Koloni, being replaced by small homestead gardens to provide for household consumption.
CHAPTER 4

The contribution of different sectors to rural household income and livelihoods: general synthesis and thesis conclusions

4.1 INTRODUCTION

Rural households adopt strategies to meet the livelihood challenges that they face in a changing society. Livelihoods strategies meet individual and household needs and also provide safety nets. It is how different people in different places live (Scoones 2009). Diversification of livelihoods is important to allow adaptability as opportunities and constraints change, to optimise the mix and income and to spread risk (Melaku et al. 2014). Livelihoods are supported not only with cash income but also natural resources (NTFPs) and small scale-farming (animal husbandry and crop production) play an important part in diversification. Diversification strategies are often a way to respond to food insecurity and therefore serve as a safety net (Dovie et al. 2005, Baiphethi & Jacobs 2009).

In Southern Africa diversification of rural households is common (King 2011, Paumgarten & Shackleton 2011, Berman et al. 2014). Diversification has been defined as a process of broadening income and livelihood strategies away from purely crop and livestock production towards both farm and non-farm activities that are undertaken to generate additional income, the sale of waged labour or self-employment in small enterprises (Hussein & Nelson 1999). It is determined by preconditions including history, social context, agro-ecology and the influence of ongoing social change linked with external interventions like infrastructure and service provision (Smith et al. 2001). Diversification is a common practice in households and only a few derive all their income from a single source (Barrett et al. 2001, Nielsen et al. 2013). The extent and nature of diversification differs from place to place as it depends on the locally available income opportunities (Nielsen et al. 2013). The contribution from wages, remittances, government grants, pensions and part-time work has also been documented and in most cases cash income contributes more to livelihood than the subsistence sectors. There are households that derive their livelihoods solely from formal cash income, and most especially non-agricultural sources or
in a combination with other livelihoods sources. Dovie (2005) found that in 30-50% of households depended on non-farm income.

Although diversification has been long recognised as an important strategy of rural households in Southern Africa, most socially-orientated surveys have omitted the contribution of NTFPs (Chapter 2). Consequently, they have underestimated the extent of diversification, as well as the value of total household income. In contrast, there has been many studies on NTFPs in rural livelihoods and the direct-use and trade income they contribute. This is likely to be in the order of billions of Rands annually, that is not accounted for in traditional surveys or local economic statistics (Shackleton et al. 2001, 2007a) Overuse or neglect of such resources could result in deepening poverty in rural areas (Shackleton et al. 2007a, 2008, Davenport 2012). However, most of these studies have been done specific NTFPs (such as wood carving, firewood sales), and there are very few that compare the income from NTFPs to other livelihood incomes (Table 2.3), which provides some indication of their overall contribution to livelihoods. Secondly, the socioeconomic factors that underlay greater or lesser reliance on NTFPs within a range of livelihood options is weakly investigated in South Africa. The objective of this chapter, therefore, is to (1) bring together the results from chapters 2 and 3, along with data on cash income from off-farm sources, (2) determine the contribution of NTFPs to rural livelihoods in Koloni and Guquka and to explore some of the household attributes that influence this, (3) investigate the relationships and dependencies between different livelihood sectors and (4) consider synthesise the main conclusions of this study?

4.2 METHODS

4.2.1 Data collection

As described in chapters 2 and 3, information on the types, quantities and the extent of use of NTFPs and agricultural products used and traded by the villagers was collected by means of a household questionnaire. Within the same questionnaire questions were asked about cash incomes from off-farm activities such as employment, government grants and remittances. Interviews were conducted with every household and were carried out uniformly to give every respondent similar exposure to the questions. Household heads were the preferred source of
information but often other members of the family were respondents. In most cases the males passed the responsibility to females in the household. The duration of an interview was between one hour to two hours depending on the number of livelihood activities a household had.

4.2.2 Data analysis

Descriptive statistics were used and data were generally presented as means and standard deviations. The quantities and values of goods and services from livestock and crops produced were calculated on a per household basis for user households. The value of resources or products per household was calculated with the quantity used and local price given (see chap 2 and chap 3). The relative proportional contribution of each livelihood sector to each household was estimated using the total values of each livelihood sector (crops, animal husbandry, cash and NTFPs) per annum and the total value of the entire livelihood sectors per annum. Statistica 10 was used to examine for significant differences or relationships between variables of interest. A principal component analyses (PCA) were used to display relationships between livelihood sectors, after which a direct regression was done to test the significance of some of the indicated possible relationships.

4.3 RESULTS

4.3.1 Characteristics of households

The mean number of people per household was at 3.4±2.3 across both villages and 3.6±2.2 and 3.2±2.3 for Guquka and Koloni, respectively. The number of people per households ranged between 1 and 12. Mean age of household heads was 60±14 years generally and 60±15 and 58±14 years at Guquka and Koloni, respectively (Fig. 4.1). Out of the 116 households that were interviewed 70 % were female-headed and 30 % were male-headed; at Guquka 78 % of households were female-headed whilst in Koloni 61 % were female-headed. Some of the female-headed households had male figures but were not staying at home and therefore the female made day to day decision around the household.
As Figure 4.2 shows, over 40% of household heads had studied till high school or some getting a matriculation certificate. Koloni had more household heads that studied till high school at 68% than Guquka at only 25%. About 3% of households in both villages had someone who went to college. A few households also had members that went to university, but these were only in Koloni (11%). This shows that Koloni household heads were more educated ($\chi^2=12.8; \ p<0.001$).
People in both villages were involved in various forms of employment, both informal and formal sectors (Table 4.1). Informal employment was defined as all other income generation activities other than those from the government and private sectors where there is an employer and people are employed with a reasonably regular income. The income from the formal sector included wages, government grants and pensions. The combined mean wage was R40 479±64 098 per household per year and remittances were R5 340±4 446 per household per year. Koloni had less households receiving wages but they had a higher value (R66 726±87 216) as compared to Guquka households that received a mean of R19 004±19 968 per household per year. With that being so, Guquka households had a higher mean value received from remittances. Government grants and pensions had a mean value of R18 917±15 461 per household per year, more households received this type of income. There was a small proportion (4 %) of households that did not receive any kind of cash income, 2 % in Guquka, and 7 % in Koloni.

Table 4.1: Proportions and mean amounts of different sources of cash income.

<table>
<thead>
<tr>
<th>Type of income</th>
<th>Guquka</th>
<th>Koloni</th>
<th>Combined</th>
<th>X²</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remittances</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HH (%)</td>
<td>HH (%)</td>
<td>HH (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean amt/yr (R)</td>
<td>Mean amt/yr (R)</td>
<td>Mean amt/yr (R)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31 5759±4966</td>
<td>33 4837±3839</td>
<td>32 5340±4446</td>
<td>0.09</td>
<td>0.76</td>
<td></td>
</tr>
<tr>
<td>Grant and pension</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>85 18458±12301</td>
<td>70 19504±18916</td>
<td>78 18917±15461</td>
<td>6.45</td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>Part-time jobs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 5400±4543</td>
<td>14 55380±87798</td>
<td>10 37206±72575</td>
<td>2.61</td>
<td>0.11</td>
<td></td>
</tr>
<tr>
<td>Wages</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>39 19004±19968</td>
<td>30 66726±87216</td>
<td>34 40479±64098</td>
<td>1.79</td>
<td>0.18</td>
<td></td>
</tr>
<tr>
<td>Proportion of hh</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>receiving from at least one source</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>98 25280±15889</td>
<td>93 46965±85701</td>
<td>96 35634±61002</td>
<td>2.91</td>
<td>0.09</td>
<td></td>
</tr>
</tbody>
</table>
4.3.2 The relationship between different livelihood sectors

A principal component analyses (PCA) did not indicate many clear associations but prompted analysis of possible associations between (i) education level and income from wages/employment, which was weakly positive ($r^2=0.076; p<0.05$); (ii) between education level and income from grants, which were significantly but weakly negatively related ($r^2=-0.05; p<0.05$), (iii) from grants and wage income, which were not significantly related ($r^2=0.028; p>0.05$) and (iv) gender of household head and income from NTFPs. For the last, female-headed households earned a higher income from NTFPs ($R_2 121\pm2 110$ per year) compared to male-headed households ($1 342\pm1 607$) and the difference was almost significant ($t=1.93; p=0.056$). When looking at village level, at Koloni there was a positive significance between cash and livestock income ($r^2= 0.16; p= 0.012$).

4.3.3 Valuation from livelihood sectors

The mean total value contribution of all livelihood sectors was $R55 \, 285\pm92 \, 014$ per household per year across both villages (Table 4.2). In Guquka it was $R34 \, 963\pm25 \, 913$ and for Koloni it was $R62 \, 462\pm96 \, 898$ per household per year. The value of cash income was estimated to contribute most (40 %) to household incomes and livelihoods at $R32 \, 925\pm77 \, 061$ per household per year. This was so at Koloni with the mean value of $R50 \, 838\pm106 \, 122$ (49 %), whilst it was not so at Guquka, the mean value was $R15 \, 524\pm17 \, 709$ (26 %) per household per year. The highest contributor to this was wages that were $R40 \, 479\pm64 \, 098$ per household per year, Guquka the mean value of wages was $R19 \, 004\pm19 \, 968$ and $R66 \, 726\pm87 \, 216$ per household per year for Koloni. The contributions from NTFPs, crops and livestock were 4 %, 1 % and 25 % per household per year, respectively.
Table 4.2: Absolute and proportional contribution of different livelihood income sources.

<table>
<thead>
<tr>
<th>Income source</th>
<th>Guquka</th>
<th>Koloni</th>
<th>Combined</th>
<th>(X^2)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean value (R)</td>
<td>Mean value (R)</td>
<td>Mean value (R)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NTFPs</td>
<td>1851±2095</td>
<td>1934±1913</td>
<td>1891±2000</td>
<td>0.5</td>
<td>0.47</td>
</tr>
<tr>
<td></td>
<td>5.3</td>
<td>3.0</td>
<td>3.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crops</td>
<td>615±745</td>
<td>548±595</td>
<td>577±661</td>
<td>0.00</td>
<td>0.99</td>
</tr>
<tr>
<td></td>
<td>0.9</td>
<td>0.6</td>
<td>0.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Livestock</td>
<td>11165±25985</td>
<td>23501±29659</td>
<td>17183±28351</td>
<td>0.24</td>
<td>0.62</td>
</tr>
<tr>
<td></td>
<td>22.7</td>
<td>26.4</td>
<td>25.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grants</td>
<td>18458±12301</td>
<td>19504±18916</td>
<td>18917±15461</td>
<td>0.30</td>
<td>0.59</td>
</tr>
<tr>
<td></td>
<td>44.7</td>
<td>21.4</td>
<td>30.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wages</td>
<td>15524±17709</td>
<td>50838±106122</td>
<td>32925±77061</td>
<td>11.3</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>26.3</td>
<td>48.6</td>
<td>40.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>34963±25913</td>
<td>62426±96898</td>
<td>48458±71421</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The NTFPs only contributed 4% to household annual income with the combined mean value per year at R1891±2000. The contribution was higher at Guquka, 5%, than Koloni (3%). The mean value per year at Guquka was R1 851±2 095 and R1 934±1 913 at Koloni. This could be attributed to several reasons like households relying in buying than using resources freely available. Cropping came at the bottom; one percent at both villages.

### 4.3.4 Change in the contribution of different sectors in the last decade

Table 4.3 compares the mean values of different sources of income between 2005 and 2013. Cash contribution of crops had decreased by more than half at Guquka. Fields had been abandoned and there was little grown in home gardens. Different reasons were given, including lack of time, insufficient money to invest of agricultural activities, no draught power to prepare land, livestock destroying crops, old age and lack of energy to do so anymore, or just not interested in crop production. In Koloni there was no change in the value, but considering the level of inflation in the intervening period, then the real returns from cropping in Koloni had decreased significantly.
Table 4.3: Comparison of income contribution between 2005 and 2013.

<table>
<thead>
<tr>
<th>Type</th>
<th>Guquka Mean value (R)</th>
<th>Koloni Mean value (R)</th>
<th>Combined Mean value (R)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crops</td>
<td>1602±</td>
<td>615±</td>
<td>514±</td>
</tr>
<tr>
<td></td>
<td>1524</td>
<td>745</td>
<td>346</td>
</tr>
<tr>
<td>Livestock</td>
<td>12854±</td>
<td>11165±</td>
<td>44556±</td>
</tr>
<tr>
<td></td>
<td>34281</td>
<td>25985</td>
<td>61014</td>
</tr>
<tr>
<td>Cash</td>
<td>42772±</td>
<td>25280±</td>
<td>78565±</td>
</tr>
<tr>
<td></td>
<td>35398</td>
<td>15889</td>
<td>91447</td>
</tr>
</tbody>
</table>

Livestock cash income contribution at Guquka was similar between the two surveys, whereas in Koloni the difference was clearly visible as the 2005 mean value (R44 556±61 014) was twice that of 2013 (R23 501±29 659). Reasons included that livestock were dying because they did not have money to treat the diseases. Dipping was not consistent as it used to be because households had to buy their own supplies most of the time because the one the government provided was not strong enough.

There was a large difference between the two data sets when it came to cash income. Data from 2005 almost doubles that of 2013. This indicates that either households have become substantially poorer or the methodological differences between the two surveys have masked any meaningful comparison.

There was no change when looking at the proportion of households utilising NTFPs between 2005 and 2013. Households practicing crop farming had decreased in Guquka and increased in Koloni. Livestock ownership had increased at both sites.
Figure 4.5 shows the relationship between total household income and the different sources. Figure 4.5a shows that the majority of households received little income from NTFPs, it did not matter whether wealthy or poor but also as the wealth increase the use decreased or was not there at all. Government grants and livestock also contributed to poor household income more.
Figure 4.3: Scatter plots of total household income against (a) NTFPs, (b) crops, (c) livestock, (d) cash and (e) government grants.
4.4 DISCUSSION

The main livelihood sectors at these two villages were wages, social grants, remittances, and livestock. Non-timber forest products were used but had little contribution to livelihoods. The general high dependence on social grants in these villages showed that many people are poor, lack of job opportunities also contributed.

4.4.1 Values from all livelihood sectors

The role of crop production to rural livelihoods and national accounting is now known to contribute towards households. Even though this is so, crop production did not contribute much to these two villages, it was the lowest contributor to household income. Maize used to be the main contributor but these communities did not grow it in large quantities. Livestock on the other hand was the second highest contributor to livelihoods, 31 %, the value also included the non-marketed product output received by certain households. The contribution from livestock alone was 31 % which was half of the total cash income. The overall value from the agricultural sectors was 32 % but it was still less than the cash income sector. Non-timber forest products have been shown to contribute to rural livelihoods by a lot of studies; in this study they had little contribution towards household income. Wages was the highest contributor to cash income sector.

Governmental and private grants contributed a mean value of R18 917±15 461 per household per year across all households in both villages. At Guquka and Koloni the mean value were R18 458±12 301 and R19 504±18 916 per household per year. Thondhlanal et al. (2012) reported that in both communities that were studied social grants had a contribution of up to 27% to the total household income, 14 % came from livestock and only five percent from remittance less than. Crop production was the least contributor to household income. Similarly to Lahiff (2005) who found that crop production contribution was minor when compared to that of wages and pensions (which came second after wages) contributing about 10 and 20 % of average household’s income. Households can use money received from pension to supplement cropping, while for other households it can remove the incentive to engage in crop production. Hebinck & Lent (2007) there was a male that was poor before reaching the suitable age for pension and used to have ambition to increase production area but changed his mind.
upon receiving it and the need to expand decreased and the production was also less. The unemployed youth depended on the pension received by an elder available in the household.

Bank & Minkley (2005) recognised that government grants alone are unable to change rural people’s lives. Arguing that grants are not secure and are lost when the receiver passes away or the child grows up. In a study done in the Eastern Cape showed that households depended on grants as their main source of income Shackleton et al. (2014).

4.4.2 Interrelationships between land-based livelihoods and cash stream sectors

Values from NTFPs and crops were not significantly correlated, this may be an indication that households did not depend much on both of these, as the PCA has shown they were relatively close to each as compared to other attributes. Also according to cash contribution towards household income was low from both these sectors there was no significant correlation between any of the sectors (crops, NTFPs and livestock) the only significant correlation was between education and cash income. This may mean that households now depend a lot on cash more than they are to collection of resources or practicing crop farming. A point of interest was that Koloni household heads were more educated, yet cropped more even though they received more cash income. This means that the still recognise crop production as strategy to enhance their livelihoods by supporting the other sectors.

There was a relationship between livestock and cash income at Koloni. The proportion of livestock contribution to household income was higher at Koloni than Guquka. Koloni area was formed by Europeans for the loyal natives, the two settled close to each other. This way they were thought ways of crop and livestock farming. Sheep were introduced to the community and the villagers were shown how to shear the fur and trade with it. Livestock and education were closely related but there was no significant correlation between the two. When a household has money it easy to purchase and look after livestock so that it grows and become savings for the household. An example is that of a family guy that never used to crop farm while earning a good salary because he felt he could afford to purchase. None of these livelihood sectors independent of each other.
Government grants play an important role in poverty alleviation of rural households. The grants have a low contribution but they help with the gap. The majority of the grants come from child support grants. A study done reported that 13.4 million people received social grants; 2.3 million were old age pensions, 1.4 million disability grants and 9.1 million child support grants (Leibbrandt et al. 2010).

4.4.3 Village attributes and livelihoods

Characteristics of households could play a major role in shaping the participation of households in different livelihood sectors. In this study the role and influence of education was examined with a PCA but this did not generate any significant impact on the overall pattern observed between livelihood sectors.

The clear missing of formal markets in these villages could explain the fact that the money was not channelled into trade. The features of building structures in the villages may offer an explanation that households spent money on building material as the houses were modern. Most houses were built with cement blocks and the roof was most of iron but there were other households that had thatched houses, especially old houses.

Hebinck & Lent (2007) in a book about Guquka and Koloni reported that Guquka’s relocation of some households could have been a constraint to secure tenure, on farm investment, and that could have had a negative effect on agricultural productivity and sustainability if considerations not given to individual needs. The low direct use value of crops per household was not surprising as most household did not see cropping as a livelihood source and would not like to invest their efforts. This was not related to the type of source of income as those households that only dependent on grants did not produce crop. The size of allocated land for household farming could be an obstacle to crop production but that was not so as Koloni had smaller gardens but cropped more than Guquka which had large gardens. A few reasons are mentioned in chapter 4. These include soil fertility, money to invest on farming, soil erosion etc.
Baipethi & Jacobs (2009) reported that there was a substantial increase in dependence on market purchase by households, rural and urban. This could explain the decrease in the crop production activities and the low use of NTFPs. Crop production as it has been mentioned was the least contributor to household income but was still part of the diverse opportunities used by households to increase and stabilise income. In earlier studies livestock and crops contribute half to household income, like Baipethi & Jacobs (2009) mentioned but that was no so in this study. Therefore meaning wage employment, self-employment grants contributed more.

A scatter plot done between the proportions of income from NTFPs (Figure 4.5a) that there is no difference in the contribution of NTFPs to poor and wealthy households which is similar to what Paumgarten & Shackleton (2009) reported; McElwee (2008) reported the same in a study done in Vietnam. In Kat River the difference in consumption between poor and wealthy households was in the amount (Shackleton & Shackleton 2006).

4.5 SUMMARY FINDINGS AND STUDY CONCLUSIONS

4.5.1 Role played by NTFPs

All households used at least one NTFP, but their contribution to total annual household income was low for most households when compared to previous research, in both South Africa and other countries (Crookes 2003, Angelsen et al. 2014). Most commonly used NTFPs are firewood (84 %), fencing poles (91 %) and plants used for rituals (84 %). They only contributed 3.4 % to household annual income across both sites. A few households still used NTFPs quite extensively, for which they contributed greater than 20 % of total household income. However, this was less than one-quarter of the sample households. Typically, higher contributions were found amongst the poorest household, which is similar to much other work internationally (Shackleton & Shackleton 2006, Mutenje et al. 2010, Angelsen et al. 2006). Noteworthy was the low use of some NTFP resources, such as wild fruits and vegetables, by residents in these two villages in contrast to their high use in other South African villages, even in the Eastern Cape (Shackleton & Shackleton 2006, Shackleton et al. 2007c). There appeared to be almost complete substitution by domesticated varieties, either grown at home or purchased.
The low contribution of NTFPs to income for most households in these two villages is not easy to explain and is likely to be due to a combination of factors rather than a single one. The most significant is probably the relatively high off-farm incomes, especially from government grants and employment. Others that were mentioned during this study include concerns by women for their safety when walking out in the communal lands, a lack of time, the aging profile of the village residents and the increasing distance (over time) involved to gather NTFPs. At Guquka the forests that were not very close and were on steep slopes making collection especially arduous. Koloni, on the other hand, was very far from a forest; the village was surrounded by thicket in the valleys and up *Acacia karroo* as a pioneer species that grew after the fields were abandoned.

### 4.5.2 Cultivation

Most households were still cultivating to some degree, but for most it was quite minor, and thus there was more gardening than farming. Nobody cultivated fields at Koloni, and only a few households did so at Guquka. Consequently, cropping contributed only a negligible proportion of total household income, less than one percent across both sites. Only 59% of households across villages were cultivating, and they did so to provide supplementary food for the household and not to sell. The number of households cultivating had decreased when comparing with data from 2005 collected at the same sites. As with reasons for the low use of NTFPs, there are likely to several reasons for the low contributions from cropping, the magnitude of which will differ between individual households. These include: a reported lack of money to support cropping, no draught power to prepare the land, climate change affecting the timing of the rainy season and too many hot days, declining soil fertility, disinterest and a lack of incentives as the amount of off-farm incomes increase and livestock raiding crops because no one was looking after them. A few commented that diets were changing and maize was less preferred in favour of rice and wheat bread.
4.5.3 Livestock

Relatively few households owned cattle (35 %), and of those who did, they kept them mainly for savings and traditional purposes and rarely slaughtered or sold any. They did not use them for draught power either (only one household reported using them to collect kraal material from the forest). Because most households did not keep their livestock at home, only a few received goods like milk, cow dung and animal manure. This only happened in Koloni. Keeping of cattle for payment of lobola was also not considered very important anymore, as increasingly cash payments had substituted payments with cattle. There were also similar statements regarding overall wealth status. The wealth of a household used to be gauged by the number of livestock they had, but nowadays it is by the amount of money they have and the assets they own (such as cars, type and size of house, ability to educate children, etc.). This may be so but cattle are still regarded as a good way of saving for households as they can be sold when cash is needed, and can also be slaughtered for meat during celebrations or rituals. Many households keep small stock such as goats (17 %), sheep (9 %), pigs (14 %) and chickens (55 %), but relative to cattle, the contribution to household income is relatively low for most (but not all) households. Goats were mostly kept for rituals and rarely sold. Sheep were kept for celebrations, not rituals.

The youth are seemingly not interested in land-based livelihoods and rely on social grants to the household (i.e. their parents or grandparents) and casual employment. No young person that was unemployed and staying at home cultivated land to support themselves or assist the household. They were all dependent on the elders and complained that there were no job opportunities available. A common sentiment expressed by several older people interviewed was that they felt that the younger generation is lazy, they do not want to work hard for anything and that they want to be handed everything on a silver platter. All felt that within the next generation there will be no cropping at all in the villages. Once again, this appears to be a widespread finding across several studies in South Africa (Twyman et al. 2004, Shackleton et al. 2013). However, it must be noted that this is not a new process, and disengagement in agriculture has been going on for a long time in the former homeland areas, driven by high population pressures, unviable land sizes for farming, declining soil fertility, increasing state support and increasing participation in the economy via wage labour and urban migration (McAllister 2000, Hebinck & Lent 2007). Improved access to and quality of education in the
rural areas in the last two decades has also opened up other opportunities for the youth and most aspire for secure jobs in towns rather than stay in the villages.

4.5.4 Dependence on government grants

The contribution of government social grants to household annual income was 30% across the two sites. They were the second contributor after cash income from wages. Grants include private grants, old age pensions, disability grants and child support grants. About 78% of households received government grants, Guquka households getting slightly more (85%) than Koloni (70%), which is similar others sites in the Eastern Cape (e.g. Neves & du Toit 2013, Shackleton et al. 2014). This illustrates the statement that households depend on cash-based livelihood more. This money can be used to supplement crop production but usually the money is needed to support other household needs. Some households stop cultivating upon the receipt of any sort of cash income because they can afford to purchase from town for their families (Hebinck & Lent 2007). Although grants protect families from falling into deeper poverty they cannot, alone, support livelihoods because they are lost when the elders pass away or children grow up (Bank & Minkley 2005). The majority of grants received were child support grants.

4.5.5 Key similarities and differences between Guquka and Koloni

4.5.5.1 Similarities

The contribution of NTFPs and crops was very low at both sites. As it has been mentioned in the previous chapters, the cause is not clear but a few speculations were made. It could be that livelihoods are now cash dependent therefore collection of NTFPs is not considered important as households can purchase. No trade in NTFPs, only one household in Koloni collected firewood, kraal material and poles for households. This is supported by the previous statement, if households are not using NTFPs then it is unlikely they will trade in them because they have to collect and prepare or refine them. The contribution towards household income may have been low but each household used at least one NTFP as part livelihood strategies. This means they are still important to some extent.
A few households cultivated in small amounts, only in homestead gardens. Land-based livelihoods had decreased (abandoned fields), when comparing with data from a decade, but Guquka had a few that still used their fields. Maize is no longer viewed as an important crop like it once was, this may be one of the reasons why households stopped cultivating fields. Other reasons include money to invest in cultivation, time (for those that are working or live in urban areas), being old and not able to crop anymore, and also being new at the site.

Savings from livestock contributed the highest to the annual mean value from agriculture. Livestock was not kept for commercialisation but as savings (fall back plan) or to be used for rituals. Goods and services were not extensively used at both sites but they liked the idea of having choice to do so. Animal manure was the only thing most households reported using. Young people were not interested in practising agriculture, it would not earn them enough money.

4.5.5.2 Differences

Koloni household heads were more educated than Guquka. This could be because they had missionaries back in the day and they have a school from primary till high school. This could explain why the cash contribution was almost double (49 %) in Koloni when comparing with 26 % contribution in Guquka. Guquka on the other had did not have the support from colonisers and the school ends in primary, high school is in the next village.

Koloni had more households cultivating while there was a significant decrease in Guquka when comparing with 2005 data collected at the same sites. Koloni is a little bit far (approximately 37 kilometres) from town (King William’s Town) so it is not easy to purchase frequently. This could be the reason why they still grow so they can have fresh vegetables. Guquka on the other hand is fairly close (28 kilometres) to Alice and there is a tarred road between Hogsback, which is a tourist attraction area, and Alice.

Government grants had more contribution to household total income in Guquka 45 % while at Koloni the contribution was half at 21 %. Koloni had more educated household heads, meaning they earn wages which makes them less dependent on government grants. It could also mean there were not a lot of people that qualified for government grants at the time of the study.
4.5.6 Continuation of what has been documented

These results are not surprising and suggest a continuation of a decline in land-based livelihoods as already documented in Hebinck & Lent (2007) book for these two villages. This worked has added NTFPs to the picture being developed by Hebinck & Lent (2007).

According to Hebinck & Lent (2007) until the 1900 rural livelihoods of households in both villages were primarily land-based. From then onwards crops and livestock became supported by cash income derived from the other places outside the villages, mostly by male migrants. In 1930 in Guquka and 1960 in Koloni local activities decreased, especially agriculture. Livelihoods moved from local production to outside derived income. Government grants became increasingly available to households, especially after the mid-1990s political transition, when the value of grants was increased, new grants introduced and more household become recipients. In 2004 the proportions may have been slightly different but about 43 % and 59 % of households in Guquka and Koloni, respectively, were receiving and such grants. It is now 85 % and 70 %, respectively. Whilst not necessarily the driving reason for declines in use of NTFPs or agriculture, these injections of cash must have certainly contributed. Those that were working in nearby urban areas were travelling daily, weekly or monthly to and from town, and therefore there was a reduced need to produce food for home consumption because it could be bought in towns. Migration permanently or semi-permanent to urban areas developed in the late 20th century. This was happening a lot in 2004 and it was visible in 2013 where there were some homesteads that are no longer occupied.

The impact of transformation from production to consumption, as Hebinck & Lent (2007) refer to it, was visible most in the arable land where in the past much was cultivated with crops but during the study most fields were covered by grasses, weeds, shrubs and bush, showing that they had been abandoned for several years. Therefore, it would not be easy to bring back the culture of cultivating fields. The abandoned fields were used for gathering. The communities could gather thatch grass, herbs, medicinal plants and firewood.
4.5.7 Way forward

If one wants to promote use of the land for farming, then three primary avenues should be looked at. (i) Invest in current farmers (not whole community) to address their needs and constraints, (ii) ensure access to sufficient and viable land rental agreements for those wishing to farm, and (iii) intensify cultivation of gardens with sound practices and inputs to maintain the soil fertility and water infiltration.

Firstly, Hebinck & Lent (2007) confirmed that these two communities are not farmers in waiting. Markets are difficult as rural households need money to clothe and educate their children, and purchase energy. Investing in current farmers would be a good idea as not everyone in interested in farming so better to focus on those that are willing but are struggling to support for one reason or another. Such farming would then be market orientated rather than for home consumption. The target markets would likely be local towns, which are relatively close. If there were some successful farmers in each village, they may provide employment for the youth as well as role model of what is possible.

Secondly, intense cultivation of gardens with sound practices and inputs to maintain the soil and water infiltration. The majority of households cultivated food gardens and therefore investment should focus more of home gardens. Motivate households to grow food to save money and provide fresh and healthier food. Farming for household consumption is not enough, a way commercialise has to be involved to make it a viable livelihood option.

In places like Koloni, crop yields are limited by water shortage in the soil and also because it does not rain as much and soil water retention. Water conserving technologies to irrigate dry lands could be useful in areas like Koloni, for gardens and fields. Guquka is challenged by soil erosion and soil acidity. Simple methods solve acidity. Soil erosion would require more intensive interventions, but could be done through the Natural Resources Management programme of DEA on land rehabilitation.
Ownership of livestock in large numbers makes it possible to use animal for draught for different purposes. SANAT (South African network for animal traction) and ARC (agricultural research council) developed technology to be used by small-scale farmers with draught but it never reached the users. Fencing to keep livestock out is also important as livestock roam around without a guard.

NTFPs that have market demand could be harvested and sold. Key ones include medicinal plants and firewood. The latter is common as wattle at Guquka and acacia invasion in old fields at Koloni. Medicinal plants are harder because of the risk of overharvesting. But people could be encouraged to cultivate them as has been done elsewhere in the Eastern Cape.

Lastly, even though the results have been presented by each livelihood sector individually, it has been stressed earlier in this thesis that livelihoods are diverse. But government support in rural areas does not acknowledge the diversity and there is with limited interaction. Shackleton (2009) suggested the need for a rural livelihoods ministry or division that will work with village communities across the range of needs and livelihood activities simultaneously.

4.6 CONCLUSION

Each household used at least one NTFP but their contribution to total annual household income was small, smallest to be reported in South Africa and other regions. Firewood was one of the NTFPs that were still widely used at both sites, even though they have electricity. Crop production had the lowest contribution to the agricultural income towards household income. Livestock contribution was of significant importance to agricultural contribution. Goods and services provided by livestock were not commonly used, only a few households in Koloni did. The main reason of keeping livestock was to have a fall back plan in difficult times. Cultivation was for household consumption and the produce was significantly small. Cultivation was focused on homestead gardens and not on fields, at both sites, with only a few households using the fields in Guquka. Crop production on a field scale will not be easily brought back to those that have stopped. The decrease in land-based livelihoods shows the move to cash-based livelihoods for the rural households.
5. GENERAL REFERENCE LIST


APPENDIX 1: QUESTIONNAIRE

SECTION A: HOUSEHOLD SURVEY OF IMPORTANCE OF NTFPS

<table>
<thead>
<tr>
<th>Questionnaire No.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of the interview</td>
<td></td>
</tr>
<tr>
<td>Name of the village</td>
<td></td>
</tr>
<tr>
<td>Household Reference No.</td>
<td></td>
</tr>
<tr>
<td>GPS coordinate</td>
<td></td>
</tr>
</tbody>
</table>

SECTION B: NATURAL RESOURCE USE

FIREWOOD

Does your household use firewood? [Yes] [No]

How often is it used? ___________________________________________

How does your household get firewood? [Buy] [Collect]

If you collect, how much collected? _______________________________

Who collects? ___________________________________________________

How much is used by your household? ______________________________

Where is it collected? ___________________________________________

How long does it take to get there? _______________________________

If bought, where is it bought?_____________________________________

How much is bought? ____________________________________________

Generally, how much is it sold for locally? _________________________

Does your household ever sell firewood? [Yes] [No]

How much is sold? _____________________________________________

How often is it sold? ___________________________________________

Why does your household sell? ___________________________________

Commonly used species__________________________________________________________________________________
EDIBLE FRUITS

Does your household use wild fruits?  [Yes]  [No]

How often are they used?  ___________________________________________

How does the household get wild fruits?  [Buy]  [Collect]

If collected, how much collected?  _____________________________________

Who collects?  _______________________________________________________

How much is used by your household?  ___________________________________

Where is it collected?  _________________________________________________

How long does it take to get there?  _____________________________________

If purchased, where is it bought?  _______________________________________

How much is bought?  _________________________________________________

Generally, how much are they sold for locally?  ___________________________

Does your household ever sell wild fruits?  [Yes]  [No]

How much is sold?  ____________________________________________________

How often is it sold?  _________________________________________________

Commonly used species
____________________________________________________________________________________

EDIBLE HERBS

Does your household use wild herbs?  [Yes]  [No]

How often are they used?  ________________________________________________

How does the household get wild herbs?  [Buy]  [Collect]

If collected, how much collected?  _________________________________________

Who collects?  ___________________________________________________________

How much is used by your household?  _____________________________________

Where is it collected?  ____________________________________________________

How long does it take to get there?  _________________________________________

If purchased, where is it bought?  _________________________________________

How much is bought?  ____________________________________________________

104
Generally, how much is it sold for locally? _____________________________

Does your household ever sell edible herbs? [Yes] [No]

How much is sold? _____________________________

How often is it sold? _____________________________

Commonly used species
________________________________________________________________________________

PALM HAND BRUSHES

Does your household use palm hand brushes? [Yes] [NO]

How does the household get palm hand brushes? [Buy] [Produce]

If it is produced, how much is collected? _____________________________

Who collects? _____________________________________________

How much is used to produce for the household? _____________________________

Where is it collected? _____________________________________________

How long does it take to get there? _____________________________

If bought, where are they bought? _____________________________________________

How many are bought? _____________________________

Generally, how much are they sold for locally? _____________________________

Does your household ever sell palm hand brushes? [Yes] [No]

How many are sold? _____________________________

How often are they sold? _____________________________

Commonly used species
________________________________________________________________________________

GRASS HAND BRUSHES

Does your household use grass hand brushes? [Yes] [No]

How does your household get grass hand brushes? [Buy] [Produce]

If produced, how much grass is collected? _____________________________

Who collects? _____________________________________________

105
THATCH GRASS

Does your household use thatch grass? [Yes] [No]

How does your household get thatch grass? [Buy] [Collect]

If collected, how much is collected? _____________________________________________

Who collects? __________________________________________________________________

How much is used by the household? ___________________________________________

Where is the grass collected? ________________________________________________

How long does it take to get there? __________________________________________

If bought, where is it bought? ________________________________________________

How much are bought? ______________________________________________________

Generally, how much is it sold for locally? ______________________________________

Does your household ever sell thatch grass? [Yes] [No]

How much are sold? __________________________________________________________

How often is it sold? _________________________________________________________

Commonly used species
__________________________________________________________________________

__________________________________________________________________________
WEAVING MATERIAL

Does your household use weaving material?   [Yes]   [No]

How often is it used?   ___________________________________________

How does the household weaving material?   [Buy]   [Collect]

If collected, how much is collected?   _______________________________

Who collects?   _________________________________________________

How much is used for the household?   ______________________________

Where is it collected?   ___________________________________________

How long does it take to get there?   _______________________________

If bought, where is it bought?   _________________________________

How much is bought?   ___________________________________________

Generally, what is the local price?   ______________________________

Does your household ever sell weaving material or products?   [Yes]   [No]

How much/many is/are sold?   _______________________________________

How often is it sold?   ___________________________________________

Commonly used species
______________________________________________________________________________________

KRAAL POLES

Does your household use kraal poles?   [Yes]   [No]

How often are they replaced?   _______________________________________

How does your household get kraal poles?   [Buy]   [Collect]

If collected, how many are collected?   _______________________________

Who collects?   _________________________________________________

How many is used by your household?   ______________________________

Where are they collected?   ___________________________________________

How long does it take to get there?   _______________________________

If bought, where are bought?   ____________________________________

How many are bought?   ___________________________________________

Generally, what is the local price?   ______________________________
Does your household ever sell kraal poles? [Yes] [No]

How many are sold? ______________________________

How often are they sold? ______________________________

Commonly used species __________________________________________________________________________

KRAAL BRANCHES

Does your household use kraal branches? [Yes] [No]

How does your household get kraal branches? [Buy] [Collect]

How often are they replaced? ______________________________

If collected, how many are collected? ______________________________

Who collects? __________________________________________________________________________

How much is used by your household? ______________________________

Where are they collected? _____________________________________________

How long does it take to get there? ______________________________

If bought, where are they bought? _____________________________________________

Generally, what is the local price? ______________________________

Does your household ever sell kraal branches? [Yes] [No]

How many are sold? ______________________________

How often they sold? ______________________________

Commonly used species __________________________________________________________________________

FENCING POLES

Does your household use fencing poles? [Yes] [NO]

How does your household get the fencing poles? [Buy] [Collect]

If collect, how many are collected? ______________________________

Who collects? __________________________________________________________________________

How many are used by your household? ______________________________
WHERE ARE THEY COLLECTED? _____________________________________________

How long does it take to get there? ________________________________

If bought, where are they bought? ________________________________

How many are bought? _______________________________________

Generally, what is the local price? ________________________________

Does your household ever sell fencing poles? [Yes] [No]

How many are sold? _______________________________________

How often are they sold? _______________________________________

Commonly used species

_______________________________________________________________________

WOODEN UTENSILS

Does your household use wooden utensils? [Yes] [No]

Please name the utensils that are used in your household

_______________________________________________________________________

How does your household get wooden utensils? [Buy] [Produce]

If produced, how much wood collected? _____________________________

Who collects? ___________________________________________________

How much is used for your household? _____________________________

Where is the wood collected? ______________________________________

How long does it take to get there? ________________________________

If bought, where are they bought? ________________________________

How many are bought? _______________________________________

Generally, what is the local price these wooden utensils? _____________________________

Does your household ever sell wooden utensil? [Yes] [No]

How many are sold? _______________________________________

How often are they sold? _______________________________________
MEDICINAL PLANTS

Does your household use medicinal plants? [Yes] [NO]

How often are they used? ________________________________

How does your household get medicinal plants? [Buy] [Collect]

If collected, how much is collected? ________________________________

Who collects? ________________________________

How much is used by your household? ________________________________

Where is it collected? ________________________________

How long does it take to get there? ________________________________

If bought, where are bought? ________________________________

How much is bought? ________________________________

Generally, what is the local price? ________________________________

Does your household ever sell medicinal plants? [Yes] [No]

How much is sold? ________________________________

How often is it sold? ________________________________

RITUALS

Does your household plants for rituals? [Yes] [No]

How often are they used? ________________________________

How does the household get the plants used? [Buy] [Collect]

If collected, how much is collected? ________________________________

Who collects? ________________________________

How much is used by your household? ________________________________

Where is it collected? ________________________________

How long does it take to get there? ________________________________
If bought, where is it bought? ____________________________________________

How much is bought? _________________________________________________

Generally, what is the local price for these plants? _______________________

Does your household ever sell plants that are used for rituals? [Yes] [No]

How much is sold? _________________________________________________

How often are sold? _______________________________________________

Commonly used species _____________________________________________

__________________________

TRADITIONAL STICKS

Does your household use tradition sticks? [Yes] [No]

How does the household get the traditional sticks? [Buy] [Collected]

If collected, how much collected? ________________________________

Who collects? ____________________________________________

How much is used by your household? ________________________________

Where are they collected? _________________________________________

How long does it take to get there? _________________________________

If bought, where are they bought? ____________________________________

How much is bought? ______________________________________________

Generally, what is the local price for traditional sticks? ________________

Does your household ever sell traditional sticks? [Yes] [No]

How many are sold? ________________________________________________

How often are they sold? ___________________________________________

Commonly used species _____________________________________________

 MEAT

Does your household use wild meat? [Yes] [No]

How often does household use wild meat? ______________________________

How does your household get wild meat? [Buy] [Collect]
If hunted, how much is hunting? ______________________________________
Who hunts? ______________________________________________________
How much is used by your household? ________________________________
Where is it hunted? ________________________________________________
How long does it take to get there? _________________________________
If bought, where is it bought? ______________________________________
How much is bought? _____________________________________________
Generally, what is the local price? _________________________________
Does your household ever sell wild meat? [Yes] [No]
How much is sold? ______________________________________________
How often is it sold? _____________________________________________
Commonly used species

SECTION C: Crop Production

C1 Do you grow any of your own staple foods or vegetables: [ ] Yes [ ] No
C2 If no, why not? ___________________________________________________
C3 Where do you grow your staple foods and vegetables? [ ] Homestead plot [ ] Field [ ] Both

[ ] Other (specify) _____________________________________________
C4 What is the status of the land: [ ] Owned by family [ ] Rented [ ] Open land for anyone to use
C5 What is the size of the production area for staple foods and vegetable? (if they don't know, pace it OR express it terms of known ratios which can be paced)(units!!!)

Homestead plot ___________________________
Field 1 ___________________________ Field 2 ___________________________ Field 3 ___________________________
**C6** What are the main staple foods & vegetables grown in each season and how long are they collectively worked on?

<table>
<thead>
<tr>
<th></th>
<th>Wet season</th>
<th>Dry season</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homestead plot</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fields</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How many hours a day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>work on crops</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Usually how many</td>
<td></td>
<td></td>
</tr>
<tr>
<td>people</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How many days a week</td>
<td></td>
<td></td>
</tr>
<tr>
<td>work on crops</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**C7** If you had to estimate, what proportion of your household staple foods and vegetables needs are self-grown:

<table>
<thead>
<tr>
<th></th>
<th>Almost all</th>
<th>More than ¾</th>
<th>Between ½ and ¾</th>
<th>Between ¼ and ½</th>
<th>Less than ¼</th>
<th>Tiny amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staple foods</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetables</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**C8** Please estimate the amount produced in the last planting season and the unit price in the nearest shop or market:

<table>
<thead>
<tr>
<th>Staple food or vegetable crop</th>
<th>Number of units produced</th>
<th>Type of units</th>
<th>All used at home (Y/N)</th>
<th>Some sold (Y/N)</th>
<th>Approx. % that was sold</th>
<th>Local price</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

**C9** What were the costs associated with the last production cycle:

<table>
<thead>
<tr>
<th>Input</th>
<th>Used Y/N</th>
<th>Where it/they came from</th>
<th>How many units</th>
<th>Type of units</th>
<th>If bought, was the cost per unit or in total (indicate which)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seeds/seedlings</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Fertiliser
Animal manure
Vegetable manure (compost)
Pesticides
Hired labour

SECTION D: Fruit Production

D1 Do you grow any of your own fruits: [ ] Yes [ ] No

D2 If no, why not?

D3 Where does the fruit production take place: [ ] Homestead plot [ ] Field [ ] Both

[ ] Other (specify) ___________________________

D4 What is the size of the production area for fruits? (if they don’t know, pace it OR express it terms of known ratios which can be paced)(units!!)

Homestead plot ___________________________
Field 1 ___________________________ Field 2 ___________________________ Field ___________________________

D5 What are the main fruits grown?

Homestead plot ______________________________________________________________
Fields ______________________________________________________________

D6 Approx. how many hours a day do they spend working on the fruit trees: ___________

D7 How many days a week: ___________

D8 If you had to estimate, what proportion of your household fruit needs are self-grown:

[ ] Almost all [ ] More than ⅓ [ ] Between ⅓ and ⅝
[ ] Between ⅓ and ⅝ [ ] Less than ⅓ [ ] Tiny amount

D9 Please estimate the amount produced last year and the unit price in the nearest shop or market:
<table>
<thead>
<tr>
<th>Fruit</th>
<th>Number of units produced</th>
<th>Type of units</th>
<th>All used at home (Y/N)</th>
<th>Some sold (Y/N)</th>
<th>Approx. % that was sold</th>
<th>Local price</th>
</tr>
</thead>
<tbody>
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<td></td>
</tr>
</tbody>
</table>

**D10** What were the costs associated with the last production cycle:

<table>
<thead>
<tr>
<th>Input</th>
<th>Used Y/N</th>
<th>Where did it/they come from</th>
<th>How many units</th>
<th>Type of units</th>
<th>If bought, was the cost per unit or in total (indicate which)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seeds/seedlings</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fertiliser</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animal manure</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Vegetable manure (compost)</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pesticides</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Hired labour</td>
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</tbody>
</table>

**SECTION E: Livestock Production**

**E1** Does your household own any livestock or poultry: [ ] Yes [ ] No

**E2** If your household doesn’t own any livestock, why not?

______________________________________________________

**E3** If yes, please provide the numbers of livestock and poultry kept as well as the primary purpose for keeping them:

<table>
<thead>
<tr>
<th>Livestock type</th>
<th>Number</th>
<th>What is the primary purpose for keeping livestock</th>
<th>Poultry type</th>
<th>Number</th>
<th>What is the primary purpose for keeping poultry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle</td>
<td></td>
<td></td>
<td>Geese</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goats</td>
<td>Ducks</td>
<td>Sheep</td>
<td>Chickens</td>
<td>Pigs</td>
<td>Other (specify)</td>
</tr>
<tr>
<td>-------</td>
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</tr>
</tbody>
</table>

**E4** Please indicate the type and the frequency and value of the benefits provided from **poultry**:

<table>
<thead>
<tr>
<th>Poultry</th>
<th>Frequency of slaughter to eat by household</th>
<th>Frequency live or slaughtered one is donated</th>
<th>Frequency live or slaughtered one is sold</th>
<th>Local price to buy or sell a whole one</th>
<th>Approximate no. of offspring (babies) last year</th>
<th>No. of eggs collected by hh each day or week or month (specify!!)</th>
<th>Local price of eggs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chickens</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geese</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ducks</td>
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</tbody>
</table>

**NB:** Frequency means number per period of time, i.e. per week, per month or per year; therefore MUST specify the period

**E5** Please indicate the frequency with which you slaughter or sell animal livestock:

<table>
<thead>
<tr>
<th>Livestock</th>
<th>Frequency of slaughter to eat by household</th>
<th>Frequency live or slaughtered one is donated</th>
<th>Frequency live or slaughtered one is sold</th>
<th>Local price to buy or sell a whole one</th>
<th>Approximate no. of offspring (babies) last year</th>
<th>Who looks after the livestock</th>
<th>Approx. no. of hours per day they tend the animals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sheep</td>
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</tr>
<tr>
<td>Goats</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pigs</td>
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</tr>
</tbody>
</table>

**E6** Other than meat and sales what other tangible products do you obtain from your livestock (**NB units!!!!**):

116
<table>
<thead>
<tr>
<th>Livestock</th>
<th>Milk</th>
<th>Dung</th>
<th>Other (specify)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Amount produced per time</td>
<td>Use (at home; sell; donate)</td>
<td>Local price per unit</td>
</tr>
<tr>
<td>Cattle</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sheep</td>
<td></td>
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</tr>
<tr>
<td>Goats</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pigs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Horse &amp; donkeys</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**E7** Do you use any of your livestock for ploughing or for transport: [ ] Yes [ ] No

**E8** If yes, please provide details (NB units!!!):

<table>
<thead>
<tr>
<th>Livestock</th>
<th>Transport</th>
<th>Ploughing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>How often do you use it (x per week, month, year)</td>
<td>Approx how many hours per time</td>
</tr>
<tr>
<td>Cattle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Horse &amp; donkeys</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NB:** Frequency means number per period of time, i.e. per week, per month or per year; therefore MUST specify the period

**E9** Do you every buy or cut/collect food for the livestock? [ ] Yes [ ] No

**E10** If yes, please provide details:

<table>
<thead>
<tr>
<th>Livestock</th>
<th>Buy food</th>
<th>Cut/collect food</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>How often</td>
<td>Amount</td>
</tr>
<tr>
<td>Cattle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sheep</td>
<td></td>
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</tr>
</tbody>
</table>
E11 Please indicate the main costs (other than food) associated with keeping livestock:

<table>
<thead>
<tr>
<th>Livestock</th>
<th>Type of cost (#)</th>
<th>Frequency incurred</th>
<th>Amount (cost)</th>
<th>Codes (#)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle</td>
<td></td>
<td></td>
<td></td>
<td>D = dipping</td>
</tr>
<tr>
<td>Sheep</td>
<td></td>
<td></td>
<td></td>
<td>F = fees, permits, taxes</td>
</tr>
<tr>
<td>Goats</td>
<td></td>
<td></td>
<td></td>
<td>H = herding, shepherding</td>
</tr>
<tr>
<td>Pigs</td>
<td></td>
<td></td>
<td></td>
<td>M = medicines</td>
</tr>
<tr>
<td>Horse &amp; donkeys</td>
<td></td>
<td></td>
<td></td>
<td>S = overnight shelter</td>
</tr>
<tr>
<td>Other</td>
<td></td>
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</tbody>
</table>

E12 How did you obtain the first few?

<table>
<thead>
<tr>
<th>Livestock type</th>
<th>Mode of acquisition of starting few (*)</th>
<th>Poultry type</th>
<th>Mode of acquisition of starting few (*)</th>
<th>Codes (*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle</td>
<td></td>
<td>Geese</td>
<td></td>
<td>B = bought</td>
</tr>
<tr>
<td>Goats</td>
<td></td>
<td>Ducks</td>
<td></td>
<td>G = gift or donation</td>
</tr>
<tr>
<td>Sheep</td>
<td></td>
<td>Chickens</td>
<td></td>
<td>H = inherited</td>
</tr>
<tr>
<td>Pigs</td>
<td></td>
<td></td>
<td></td>
<td>W = received as payment for herding someone else’s livestock or other work, instead of cash</td>
</tr>
<tr>
<td>Horses/donkeys</td>
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</tbody>
</table>

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### SECTION F: Household Profile

**K1** Please provide us with details of the members of your household (*start with the respondent as the first person in the table*):

<table>
<thead>
<tr>
<th>Name</th>
<th>Relation to head</th>
<th>Year born</th>
<th>Gender (M/F)</th>
<th>Highest education</th>
<th>Still studying (Y/N) (*)</th>
<th>Sleep at home (#)</th>
<th>Eat at home (#)</th>
<th>Occupation</th>
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</thead>
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</tbody>
</table>

**Codes:**
- *: P = primary school;  S = secondary school;  C = college;  U = university
- #: U = usually;  W = mainly weekends;  M = mainly a few days per month;  R = rarely

### SECTION G: Cash income sources

**G1** Does this household receive regular remittances (cash, food, etc.) from people not normally living here?

[ ] Yes [ ] No

**G2** If yes, please supply details:

<table>
<thead>
<tr>
<th>Nature of the remittance (i.e. what is it – cash, clothing, food)</th>
<th>How often is it received</th>
<th>How much is sent</th>
<th>Who sends it</th>
<th>Who do they send it to</th>
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</thead>
<tbody>
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</tbody>
</table>
G3 Does this household receive regular income from renting out rooms or land: [ ] Yes [ ] No

G4 If yes, please provide details

<table>
<thead>
<tr>
<th>What is rented out</th>
<th>Income received</th>
<th>Frequency of receipt</th>
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</tbody>
</table>

G5 Does this household receive any welfare grants or government or private pensions or investment income?
[ ] Yes [ ] No

G6 If yes, please supply details:

<table>
<thead>
<tr>
<th>Nature of the grant or pension</th>
<th>How often is it received</th>
<th>How much is received each time</th>
<th>Who in the household receives it</th>
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G7 Does this household receive any non-cash regular welfare support, such as meals at schools for children?
[ ] Yes [ ] No

G8 If yes, please supply details:

___________________________________________________________________________________________
G9 Is anyone in this household self-employed or trades goods (casual, part- or full-time):  [ ] Yes  [ ] No

G10 If yes, please supply details:

<table>
<thead>
<tr>
<th>Who in the household</th>
<th>What do they do</th>
<th>Approx how many hours do they work per day or per week</th>
<th>Approx how much income do they earn per day, per week or per month</th>
<th>Approx how much of this income is used in the business and how much can be used in the household (express as a fraction to nearest 10 %)</th>
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</tbody>
</table>

G11 Does anyone in this household have a part-time or full-time job paid by an employer  [ ] Yes  [ ] No

G12 If yes, please supply details:

<table>
<thead>
<tr>
<th>Who in the household</th>
<th>What do they do</th>
<th>Approx how many hours do they work per day or per week</th>
<th>Approx how much income do they earn per day, per week or per month</th>
<th>Do they receive any other form of payment besides cash? If yes what and how often</th>
<th>How long have they been in this job</th>
<th>What does it cost for them to get to work and back each time</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

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