

The exclusive license for this PDF is limited to personal website use only. No part of this digital document may be reproduced, stored in a retrieval system or transmitted commercially in any form or by any means. The publisher has taken reasonable care in the preparation of this digital document, but makes no expressed or implied warranty of any kind and assumes no responsibility for any errors or omissions. No liability is assumed for incidental or consequential damages in connection with or arising out of information contained herein. This digital document is sold with the clear understanding that the publisher is not engaged in rendering legal, medical or any other professional services.

### *Chapter 3*

## **LIVELIHOOD ACTIVITIES AND INCOME PORTFOLIOS IN RURAL AREAS OF THE OKAVANGO DELTA, BOTSWANA**

*D. L. Kgathi and M. R. Motsholapheko*

### **ABSTRACT**

It is crucial to have a clear grasp of the patterns of household livelihood activities and income portfolios in the Okavango Delta in order to develop policies for reducing the vulnerability of rural households to poverty. The aim of this chapter is to enhance the understanding of the patterns of livelihood activities and the associated policy implications in the Okavango Delta, Botswana. Information used for this study was collected through literature review, formal questionnaire interviews, informal interviews, and focus group discussions. The results suggest that access to financial, physical and human capital is limited in the study areas and there is need to provide these assets in order to reduce the vulnerability of the poor to livelihood insecurity. Although access to social and natural capital is not currently a serious problem, there is need to ensure that these resources are used in a sustainable way. Household livelihood activities were diversified with an average household with four sources. Arable farming was perceived as the most important livelihood activity, followed by government assistance and formal employment. However, an analysis of livelihood income portfolios indicates that non-farm livelihood activities contribute up to 87% of household income. As in other sub-Saharan African countries, there is evidence that Botswana is becoming less agrarian, as revealed by the increasing proportion of non-farm household income. The results also reveal that the major determinants of livelihood activities are geographical, socio-economic and cultural factors. The chapter concludes that any effective poverty policy should take cognizance of these livelihood patterns.

### **INTRODUCTION**

The fast growing body of literature on rural livelihood diversification challenges the orthodoxy that it is necessary to increase agricultural yields in order to make a positive contribution to poverty alleviation in developing countries (Bryceson, 2002; Balihuta & Sen, 2001). Recent research findings suggest that sub-Saharan Africa is increasingly becoming less agrarian as shown by an increase in non-agricultural incomes. This process of de-agrarianisation, a form of diversification, is reported to be occurring where farming is “becoming a part-time, residual, or fall-back activity”. As a result, the non-farm sector

is increasingly playing a major role in the provision of livelihoods for rural households (Ellis & Allison, 2004; Bryceson, 2002; Barrett, 2001). On average, it is estimated that 50% of rural households in sub-Saharan Africa derive their income from non-farm activities in comparison to 40% in Asia (Ellis & Allison, 2004). Due to the increasing importance of the non-farm sector to rural incomes, there is now a consensus that this sector cannot be left out in any “effective rural strategy policy for Africa” (Ashley & Maxwell, 2001).

A number of studies reveal that livelihood activities are also diversified in Botswana in an attempt to manage, spread and share risks (Ellis, 2000; Rashem, 1988). Households of the Okavango Delta in Botswana are not an exception since they are also affected by natural hazards such as floods, drought, animal diseases and desiccation of river channels (Kgathi *et al.*, 2007). Clear understanding of the patterns of household livelihood activities and income portfolios in the Okavango Delta is necessary in order to develop policies for reducing the vulnerability of rural households to poverty. Despite its status as a middle high income country, with a Gross National Income per capita of USA \$ 5,840 (2007) (World Bank, 2009), Botswana faces many human development challenges. Its human development index for 2007 was 0.694 (0 is the minimum value and 1 is the maximum), compared to the value for GDP ranking of 0.820 (UNDP, 2009), suggesting that there has been only a moderate transformation of economic growth into human development.

The aim of this chapter is to elucidate the patterns of livelihood activities in the Okavango Delta and the associated policy implications. The specific research objectives of this chapter are as follows: 1) To document and analyse the diversity of rural households in the Okavango Delta, 2) To examine how livelihood activities are differentiated according to different categories of households and geographical areas in the Okavango Delta. 3) To determine how livelihood activities are mediated by social relations in terms of socio-economic status, ethnicity, and gender, and 4) to make a contribution to the formulation of poverty alleviation policy in the Okavango Delta. The main body of the chapter starts with a review of the concepts of livelihood, livelihood diversification, off-farm income and non-farm income, followed by a description of the study areas and the approach of the methods adopted. The results of the study are then analysed with particular reference to the frequencies of household livelihood activities, livelihood income portfolios, and categories of households according to livelihood activities. The last section evaluates the results and their policy implications.

## RELEVANT CONCEPTS

### Livelihood

The concept of “livelihood” is central to the discourse on poverty alleviation and rural development. In its simplest terms, a livelihood could be defined as a way of earning a living (Conway & Barbier, 1990). However, this definition does not help one operationalise the concept. A more detailed definition came from Chambers and Conway (1992) who conceptualised a livelihood as comprising the capabilities, assets (stores, resources, claims, and access) and activities required for a means of a living” Ellis (2000), modified this definition in order to bring out the issue of access to natural resources more strongly. He therefore considered a livelihood to comprise “the assets (natural, physical, human, financial and social capital), the activities, and the access to these (mediated by

institutions and social relations) that together determine the living gained by the individual or household". Activities are strategies or various ways in which households generate their livelihoods (Ellis, 2000). The means of securing livelihoods are usually diversified, and could be natural resource or non-natural resource-based (Ellis, 2000; Barrett, 2001). In order to link the concept of livelihood to the wider socio-economic, natural, and policy contexts, an important analytical tool known as the Sustainable Livelihood Framework has been developed (Scoones, 1998; Ellis, 2000; Farrington *et al.*, 2004). This is an asset-based framework which provides a structure for the analysis of the factors that cause poverty. The framework is useful in identifying the main factors that affect rural livelihoods and appropriate policy interventions that can be adopted to support livelihoods (Kgathi *et al.*, in this volume, chapter 4).

### **Livelihood Diversification**

Livelihood diversification refers to diverse portfolios of activities that households engage in over a long period of time and it differs from income diversification which refers to the composition of household income portfolios at a given point in time (Ellis, 1998). It is not necessarily a transient phenomenon as it can occur as a strategy for a safety net for the rural poor as well as a strategy for "accumulation of the rural rich (Ellis, 1999)." Livelihood diversification occurs in both rich and poor households. It is considered to be generally good for poor households in developing countries (Ellis & Allison, 2004). A number of studies reveal that the livelihood activities are diversified in the Okavango Delta and include natural resource-based and non-natural resource-based activities. There is a correlation between household assets and diversification in the Okavango Delta, confirming theories which suggest that the rich are more diversified than the poor (Wilk & Kgathi, 2007).

### **Non-Farm Versus Off-Farm Incomes**

A number of concepts are utilised to describe the various sources of income derived from the rural areas of developing countries. Income in this chapter is defined in economic terms to include both in-kind and cash income. As Ellis (2000) points out, non-economists often think of income only in terms of cash income and personal observations confirm this to be the case even among some economists. Different definitions are used to define the concepts of off-farm and non-farm, depending on the classification that is used. In a household, members may derive their income from their own farm, other farms or from other sources. The incomes derived from wages from other farms, either in cash or in-kind, are described as off-farm income (Ellis, 1998). Non-farm income includes off-farm income and other sources of income such as private and public transfers (remittances, pensions and safety nets), rental from properties, and rural trade profit (Ellis, 2000; CSO, 2004). Because rural households tend to engage in multiple livelihood strategies in developing countries, the concept of multifunctional households is often used to describe them (Ashley & Maxwell, 2001).

## STUDY AREAS AND RESEARCH METHODS

### Study Areas

The study areas were the villages of Shorobe, Etsha 6, Seronga, Gudigwa, and Sehitwa in Ngamiland District, Botswana. All the five study areas are situated in the Okavango Delta Ramsar Site; for brevity we refer to the general area where the study was undertaken as the Okavango Delta. The population and the number of households in the study areas are outlined in Table 3.1 below. Shorobe is situated 30 km to the north-eastern part of Maun, the capital of Ngamiland. The WaYei are the main ethnic group in this village. The village of Etsha 6 has the HaMbukushu as the main ethnic group. This village is one of the former 13 settlements of Angolan refugees who settled in this area in 1969/70. It is situated at the western fringe of the Okavango Delta. Seronga is situated in the eastern part of the Okavango Delta. The WaYei are the main ethnic group in Seronga. Gudigwa is situated northeast of Seronga in the Okavango Delta. The majority of households in this village are Basarwa (San people/bushmen), traditionally known to be hunter-gatherers. Sehitwa is situated 100 km to the western part of Maun, at a junction of the roads to Maun, Ghanzi and Shakawe.

**Table 3.1. Population and number of households interviewed in study areas.**

<b>Study area</b>	<b>Population in 2001</b>	<b>Total number of households</b>	<b>Number of households interviewed</b>
Shorobe	955	201	17
Sehitwa	1478	416	28
Etsha6	2629	580	36
Seronga	1641	364	30
Gudigwa	732	112	18

### Methods

The study utilised various methods such as literature review, formal questionnaire interviews, informal interviews, and focus group discussions. Primary data was collected from the five study areas of Gudigwa, Sehitwa, Shorobe, and Etsha 6. The formal questionnaire interviews or survey was undertaken in the months of August, September, and October, 2003, after doing a pre-test in the village of Tubu in the western part of the Okavango Delta. A detailed questionnaire was used to collect household data. It included questions on the following aspects: 1) the demographic features of households, 2) socio-economic-status and social capital, 3) collection of veldt products, 4) arable agriculture, 5) livestock agriculture, 6) community-based tourism, 7) fishing, and 8) government assistance initiatives.

The number of households interviewed in each village is shown in Table 3.1. A two stage stratified random sampling method was used to select the sample. First, a random sample of enumeration areas was selected. Within each enumeration area, a systematic random sample was selected using a list drawn for the purpose of the 2001 Census. The sampling unit was a household, and those interviewed were heads of households or their

wives. The households were categorised into poor, middle, and rich households using a number of assets they held (e.g. cattle, arable fields, gun, vehicle, type of house) and income earned. This information was verified through discussions with key informants in the study areas. Information was also collected through focus group discussions, undertaken only in the three villages of Shorobe, Gudigwa, and Seronga. Focus groups comprised six people from different parts of the village. They covered a number of issues such as differentiation of livelihood activities according to different categories of households and views on indicators and ranking of wealth. In addition, data from the 2002/3 Household Income and Expenditure Survey was also used to analyse the patterns of income distribution in Botswana.

Households were asked to indicate in rank order their first, second, and third livelihood activities and income sources. The frequencies of households who ranked livelihood activities and income sources as first, second and third most important were estimated. The frequencies were then added and divided by 3 to obtain the average percentages which show the importance of livelihood activities and income sources. In addition, data were summarised in the form of frequency distributions, measures of central tendency, and variation. Cross tabulations were used to determine the association between variables. The Chi square Test of Independence was utilised to test whether or not statistical independence existed between the variables.

## RESULTS

### Access to Assets in All the Study Villages

Assets or capitals are stores of wealth that a household owns and can draw from in order to construct a livelihood system (Ellis, 2000; Chambers & Conway, 1992). Forms of capital include natural, physical, human, financial and social (Ellis, 2000). Natural capital is the stock of environmental assets such as water, soil, the atmosphere, forests and wildlife (Tietenburg, 1996). Physical capital is human created, and comprises assets such as machines, buildings, roads, and other forms of infrastructure (Ellis, 2000). Human capital is the stock of knowledge and skills possessed by households for use in production activities.

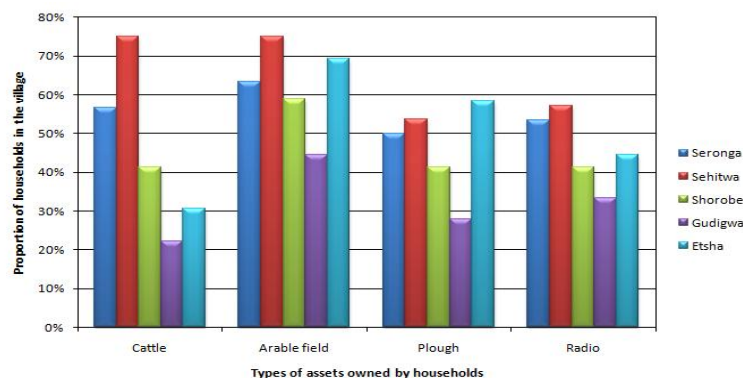


Figure 3.1. Types of capital accessed by households in the study villages.

Financial capital refers to the money households have access to in order to adapt to various livelihood strategies. There are two main sources of financial capital available: stocks and regular inflows (DFID, 1999). Available stocks include sources such as savings and credit from financial institutions, whereas regular inflows include pensions and remittances (DFID, 1999). In order to determine access of households to forms of capital, households were asked to list all the types of assets they owned. The results are summarised in figures 3.1 and 3.2.

### ***Natural Capital***

Natural capital is an important source of livelihood activities in the study areas. Most of the households have access to land for growing crops, rearing livestock, fishing and collecting veldt products in communal areas. For instance, the proportion of households who owned arable fields ranged from 44% in the study village of Gudigwa to 75% in Sehitwa. All the households had access to land for grazing in communal areas. The proportion of cattle owned ranged from 22% to 75% in the two villages, respectively. Generally, cattle were owned by less than half the number of households in three of the five study villages. Gudigwa had the lowest proportion of households that owned cattle and arable fields. Although no rigorous scientific studies have yet been undertaken to determine changes in the stocks of natural capital over time in the communal areas of the Okavango Delta, anecdotal evidence suggests that the rates at which these resources are being used is unsustainable (Kgathi *et al.*, 2007).

### ***Human Capital***

According to UNDP (2005), Botswana has made good progress in improving the quality of education in the country. The Government of Botswana has invested in education infrastructure and has attempted to improve participation in all levels of education. Currently, universal access to basic education has been achieved and there are high rates of enrolment at primary and secondary school levels, with net enrolment ratios estimated at 100% and 53%, respectively (UNDP, 2005). However, our livelihood survey showed that 58% of the households in the study areas had not attended school. In the study areas, 30% of the respondents stated that they had not completed primary level education, while only 4% had claimed to have completed secondary level education. In addition, the literacy rate for Ngamiland District is estimated at 64% which is lower than the national figure of 81% (North West District Council, 2009). Low levels of literacy tend to have an adverse effect on skills development and economic development in general. At the same time, the HIV/AIDS pandemic adversely affects the efficiency of human capital. It is therefore likely to have an adverse effect on skilled workforce as well as on the contribution of education to economic growth (Hamoudi & Birdsall, 2002). This is mainly because of the adverse impact of the epidemic in the form of increased morbidity and mortality of the rural population. In all the study areas, the proportion of households with terminally ill members ranged from 33% in Shorobe to 53% in Etsha 6. The perceived impacts of HIV/AIDs in the study areas included increased financial costs: mentioned by 46% of the households; decline in the number of people fit to work in the fields: 22%; and loss of employment: 22%.

### ***Financial Capital***

Informal discussions revealed that access to financial capital was a major constraint in the study areas. To determine the various sources of financial capital in the livelihood survey, households were asked where they would seek help when faced with financial

problems (Figure 3.2). The sources mentioned by households included those associated with financial capital such as: 1) financial institutions (mentioned by 3% of the households) and 2) micro credit (2%). Cattle are also an important form source of financial capital in the Okavango Delta and the rest of Botswana, and in some cases they are the only form of saving for rural households. To use the expression of Abel and Blaikie (1988), cattle are a means of “social security” and a “hedge against inflation” for rural households. They are also a source of food (milk, meat) and cash (when sold), however, the distribution of cattle ownership is very skewed (uneven) in Botswana, including in Ngamiland.

### *Social Capital*

The results of this study showed that social capital played a key role in livelihood systems of the Okavango Delta. When households were asked where they would get help when in financial problems, the sources they mentioned included those associated with social capital. Figure 3.2 shows that 33% of the households said they would seek help from relatives, 4% from friends and 2% from neighbours. Case studies of how households cope with the HIV/AIDS pandemic in the Okavango Delta, based on focus group discussions and informal interviews, illustrate the importance of social capital in livelihood systems. For instance, most of the HIV/AIDS-related orphans were taken care of by their relatives, suggesting that social capital was an important safety net among households afflicted by the HIV/AIDS pandemic.

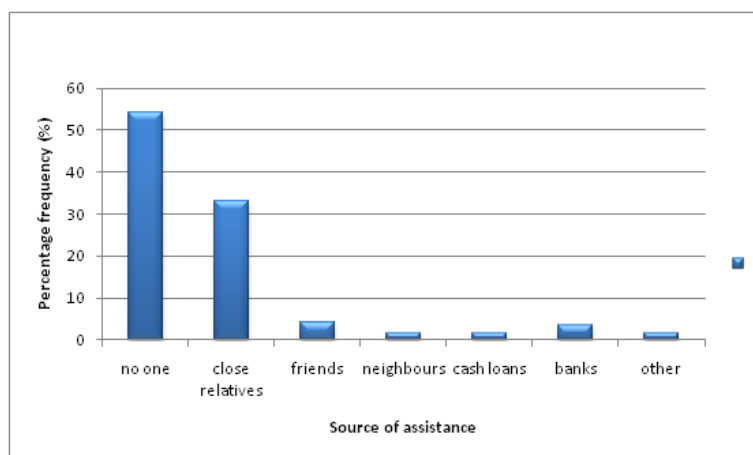


Figure 3.2. Access to social capital in all the study villages

Relatives also cared for those who were sick, assisted them with money for medication and provided financial and social support for funerals. Apart from the extended family, there were also social networks (e.g. burial societies) which provided assistance to the afflicted households in the event of death. Informal interviews in the villages of Shorobe and Sehitwa revealed that ethnic groups such as BaTswana and OvaHerero had burial societies. In the event of death, the members made financial contributions to the afflicted households, in addition to providing labour and psychological support. Focus group discussions undertaken by Wilk and Kgathi (2007) revealed that the stock of social capital was in the decline in the Okavango Delta, Botswana, mainly because of commoditisation, adoption of new cultural norms and individual production.

### ***Physical Capital***

Access to physical capital is one of the factors which contribute to poverty reduction and livelihood security as it improves the working of markets, flow of information and the delivery of inputs and outputs (Ellis, 1999). Most of the study areas are accessible by road from Maun, the capital of Ngamiland. However, the villages of Seronga and Gudigwa have poor road access. At the household level, asset ownership is limited to smaller items like the animal-drawn plough or radio; as compared to bigger ones like tractors and lorries which are common in other parts of rural Botswana. The plough was mostly used by households that cannot afford the more expensive means of ploughing such as tractors. Ploughing is mainly done with animal draught-power and is an improvement over human-based means of ploughing. Across the study area, the proportion of households who owned animal-drawn plough ranged from 28% in Gudigwa to 58% in Etsha 6. The difference in ownership of this implement is related to ownership of arable fields. To qualify for Government assistance for a plough, one is required to provide proof of ownership of an arable field. The radio was considered an important means of accessing educational information, including knowledge on new agricultural methods. The percentage of households that owned other forms of physical capital was 33% in the study area. These forms of capital included fishing nets, fishing hooks and lines, canoes, donkey carts, guns, motor vehicles and electricity generators.

### **Frequencies of Livelihood Activities in All the Villages**

This section summarises the results of the ranked frequencies of livelihood activities in all the five study areas in order to obtain an understanding of their patterns. Households were asked to mention their first, second and third most important livelihood activities and income sources and these frequencies were added and then averaged. This means that for each livelihood activity, three frequencies for the first, second, and third most important categories were generated. The frequencies of each livelihood activity for the first, second and third most important categories were added and then averaged by dividing by three. The results of these average frequencies are presented in Table 3.2.

The results of the averaged frequencies of livelihood activities reveal that arable agriculture in all the study areas emerges as a livelihood activity of the most important choice (16% of the households) followed by government assistance (9.8%) and formal employment (9.6%). The least frequently mentioned livelihood activities were drought relief projects (3.9%) and remittances (4.7%). Despite the fact that livestock agriculture was once the most important livelihood activity in Ngamiland before the eradication of livestock in 1995/96, it is now significantly reported to be less important (Fidzani *et al.*, 1999) and seems to have been surpassed by arable agriculture if household's perceptions are a reliable indicator.

Household livelihood activities were diversified such that a household could have up to five livelihood activities and income sources. On average, however, households had four (3.7) livelihood activities. The main reason for having a diversity of livelihood activities was to reduce risk. Examples of the sources of risk mentioned in focus group discussions included animal diseases such as foot and mouth for livestock farming, high floods that drowned crops in the case of *molapo* farming, and expulsions from work in the case of formal employment. According to Ellis (2000), livelihood diversification is more effective if the portfolios have a low covariate risk, than if their returns have low correlations. He further contends that while incomes from agro-based livelihood activities



are likely to have a low covariate risk, diversification into non-farm activities is likely to result in low correlations of the returns from agriculture. The idea of risk reduction as conceptualised by rural households in the Okavango Delta is similar to one used in investment portfolios, whereby a wide variety of investments are mixed in order to obtain higher returns when compared with returns from individual investment portfolios, provided that the returns are not correlated. If the returns are correlated, diversification of investment will not reduce or affect risk (Levy & Sarnat, 1970).

### **Frequencies of Livelihood Activities in Each Sampled Village**

An attempt was also made to assess the importance of livelihood activities in the five villages, using the method already outlined in section 3.4.2. The frequencies of each livelihood activity ranked as first, second, and third were added and divided by three to obtain the average frequencies presented in Table 2. In Botswana the categories of safety nets are as follows: 1) old age pension, 2) supplementary feeding of children under 5 years of age, orphans, destitutes and other vulnerable groups (referred to as Tsabana), and 3) drought relief/labour intensive public works programme (Bar-On, 2002).

#### ***Livelihood Activities in Gudigwa***

Most of the households in Gudigwa were hunters and gatherers prior to being resettled in this village in the past twenty years. The government encourages households in Gudigwa to diversify their livelihood strategies from hunting and gathering to agriculture and tourism. When Basarwa people settle in Gudigwa, the Government gives them livestock. Between 1998 and 2003 a total of 14 households were given 70 cattle in this village. The village is generally poorer than other study areas. Table 3.2 summarises the livelihood activities and sources of income of the Gudigwa people. The table shows that the livelihood activities and sources of income aggregated as "other" in the ranked frequency table (sale of veldt products, thatching, gathering, and piece jobs in Safari companies) were the most important in this village (14.8%), followed by government assistance (9.3%) which had the same frequency as arable agriculture (9.3%). Drought relief and formal employment were ranked as the third most important livelihood activities. It is evident that the people of Gudigwa did not have any dominant household livelihood activities and sources of income as they derived their livelihoods from a variety of sources. Though the livelihood activities and income sources in Gudigwa are now mixed, they are atypical of most parts of rural Botswana in that they are heavily biased towards participation in drought relief programmes, piece jobs, harvesting of veldt products and social welfare programmes. This finding confirms the theory that poor households tend to diversify via casual labour as a survival strategy whereas the rich tend to diversify in order to accumulate (Ellis, 1998; Hussein & Nelson, 1998).

The Okavango Community Trust is the main initiator of Community-based tourism activities in Gudigwa. Households said they benefited from CBNRM because it provides employment opportunities (33% of the households), funeral assistance (11%), transport (33%), income from traditional and cultural activities (11%) and other benefits. The benefits to the community were considered to be higher than those of individual households.

**Table 3.2. Average percentages of frequencies of livelihood activities and income sources ranked according to importance.**

Livelihood activity	Villages				
	Gudigwa	Etsha 6	Sehitwa	Seronga	Shorobe
Arable agriculture	9.3	25.9	8.3	15.6	13.7
Livestock farming	7.4	1.9	14.3	8.9	5.9
Formal employment	7.4	7.4	11.9	10.0	9.8
Basket making	3.7	10.2	0.0	1.1	3.9
Remittances	3.7	2.5	4.8	3.3	13.7
Government assistance	9.3	9.2	11.9	5.6	15.7
Drought relief project	7.4	2.8	2.4	3.3	5.9
Beer brewing	3.7	10.2	2.4	3.3	3.9
CBNRM	1.9	0.0	0.0	1.1	0.0
Other	14.8	10.2	4.8	0.0	3.9

Notes: The average frequencies of households who ranked livelihood activities and income sources as first, second, and third in terms of importance were added and divided by 3 to obtain the average percentages listed in the table. The percentages indicate the importance of livelihood activities and income sources. They do not add up to 100% because there were multiple responses for livelihood strategies.

However, the main concern was that CBNRM programme benefited other non-Basarwa villages more than themselves, although the situation had improved in the past three years. Due to limited access to CBNRM benefits, 67% of the households wanted their special game licenses to be restored. They contended that they no longer had access to hunting because CBNRM had been introduced; hence they wanted the old practice of special game licenses to be reintroduced.

Table 3.3 indicates that those who benefited from the old age pension accounted for 0.5% in Gudigwa and this proportion was the lowest in the study areas. Although the 2001 census revealed that there were 47 people over the age of 65, only 4 (9.8% of the population 65 years and over) had obtained old age pension in February 2004. Compared to other villages, Gudigwa had the lowest proportion of the population, which benefited from old age pension and orphan food basket. The low proportion of those who obtained old age pension and their per capita figure could be attributed to the difficulties faced by Gudigwa people in obtaining identity cards, which are an access qualification for obtaining old age pension. According to our key informants, most of the Basarwa do not know their age and this causes delays in obtaining identity cards. Although the Gudigwa households were happy to receive supplementary feeding from the Government (Tsabana, orphan food basket etc), they were concerned about the delays of their food supplies which sometimes arrived after three months.

#### ***Livelihood Activities in Etsha 6***

In Etsha 6, arable agriculture was perceived as the most important livelihood activity (26% of the households) as revealed by the ranking of the frequencies. It was followed by the two livelihood activities of basket making and beer brewing, which were practiced at

the same frequency of 10%, and lastly by government assistance (9%). The two farming systems of dryland and flood recession agriculture (known as molapo farming) are practiced in this village, though dryland farming is more commonly practiced by 61% of the households as compared to molapo farming (31%). Other households (8%) practiced both of the two farming systems. Basket making is a common livelihood activity, in this village mainly because the raw materials for making baskets are accessible and also because indigenous knowledge for weaving also exists. It has been an important commercial activity in Ngamiland since the early 1970s. Other livelihood activities and income sources in this village included livestock farming, government assistance, and beer brewing. Though only a few households mentioned beer brewing as a livelihood activity in almost all the study areas, it was more frequently mentioned in Etsha 6.

### *Livelihood Activities in Seronga*

In Seronga, the main livelihood activities and sources of income on the basis of the ranking were arable agriculture (15.6% of the households), formal employment (10%), livestock farming (8.9%), and government assistance (5.6%). Arable agriculture was mainly in the form of dryland farming as the molapo soils are sandy and therefore not suitable for crop production. The common crops are sorghum and millet intercropped with beans, millet, pumpkins and watermelons. The focus group discussions also revealed that arable agriculture was considered the most important livelihood activity in Seronga, though its production was constrained by depredation by wildlife. Other livelihood activities and sources of income were government assistance, drought relief, and community-based tourism. It was mentioned that the recipients of government assistance sometimes experienced stresses associated with the late arrival of food supplies in Seronga, like for example in the village of Gudigwa. Regarding community-based tourism, the Okavango Community Trust and Okavango Polers Trust are the main initiators. The benefits to individual households were perceived to be mainly in the form of employment opportunities (33%), funeral assistance (11%), provision of transport (33%), income from traditional and cultural activities (11%) and other forms.

**Table 3.3. Number of people benefiting from social welfare benefits in the study areas, February, 2004.**

	Gudigwa	Etsha 6	Sehitwa	Seronga	Shorobe
Orphan Food Basket <sup>1</sup> (Number of orphans)	31 (4.2%)	164 (6.2)	80 (5.4. %)	127 (7.1%)	90 (9.4%)
Tsabana <sup>2</sup> (Number of children)	134 (18.3%)	515 (19.6%)	327 (22.1%)	315 (19.2%)	151 (15.8%)
Permanent Destitute Allowance <sup>1</sup> (Number of destitutes)	14 (1.9%)	41 (1.6%)	60 (4%)	40 (2.4%)	106 (11%)
Old Age Pension <sup>3</sup> (Number of people)	4 (0.5%)	341 (13%)	287 (19.4%)	200 (11.2%)	247 (26%)

Notes: The figures in brackets denote the number of people benefiting from these programmes as a percentage of the 2001 population. Source: Sources: 1) MLG, Food Resources Department, Maun

2) NWDC, Department of Social and Community Development, Maun 3) MLHA, Department of Cultural and Social Welfare, Maun

The most frequently mentioned form of government assistance was supplementary feeding of children with *Tsabana* (porridge made from sorghum and beans), which benefited 19.2% of the population in this village, whereas orphan food basket, permanent destitute allowance, and old age pension benefited 7%, 2.4%, and 11.2% of the population in this village, respectively (Table 3.3).

#### ***Livelihood Activities in Sehitwa***

In Sehitwa, livestock agriculture (frequency of 14.3%) was ranked the most important livelihood activity, followed by government assistance (12%) and formal employment (12%). Despite the fact that all the cattle were killed in Ngamiland in order to eradicate the cattle lung disease (Bendsen & Meyer, 2003), livestock farming was perceived to be the most important livelihood strategy in Sehitwa. This village is historically known as a livestock area, but in 2004, the number of cattle was lower than those before the cattle cull in 1996. For instance in the whole of Ngamiland, the number of cattle were estimated at 320 000 before the cull, but in 2004 they were estimated at 154 108 (North West District Council, 2009; CSO, 2008). Arable farming was undertaken under dry conditions since the drying of Nhabe River and Lake Ngami, which used to be sources of water for *molapo* farming have dried. Government assistance was mainly in the form of *Tsabana*, which benefited 18.4% of the 1991 Sehitwa population. The proportions of the population, which benefited from orphan food basket, *Tsabana*, permanent destitute allowance, and old age pension, were 5.4%, 22.1%, 4%, and 19.4%, respectively (Table 3.3). Thus, the proportions of those who obtained *Tsabana* and destitute allowance were comparable to those of Gudigwa, Sehitwa and Seronga (Table 3.3). However, this village had a comparatively high proportion of old age pensioners, despite the fact that it had a relatively lower population of the age group 65 years and over. This could be due to proximity to the District Capital of Maun, which makes it easier for households to enrol for these benefits.

#### ***Livelihood Activities in Shorobe***

In Shorobe, the most frequently ranked livelihood activities were government assistance (16%), arable agriculture (14%), and remittances (14%). Focus group discussions in Shorobe revealed that the making of palm wine (*muchema*) was considered an important livelihood activity in Shorobe. It contributes substantially to livelihoods and is ranked third in terms of livelihood contribution after arable and livestock agriculture. Wine-making was followed by government assistance, formal employment/ remittances, and basket-making. Arable agriculture is mainly in the form of dryland and dry *molapo* farming. Households who had *molapo* fields continued to use them after the river had dried, hence we refer to this farming system as dry *molapo* farming. The village had the highest proportion of those who obtained orphan food basket (9.4%) in the study areas because of the high number of HIV/AIDS related orphans. The epidemic has resulted in the lowest proportion of children in the age group 0-4 in the study areas.

#### ***Summary and Synthesis***

The foregoing section has shown that in all the study areas, arable agriculture was perceived as the most important livelihood activity or source of income on the basis of the ranked livelihood activities. Next in importance were social welfare programmes and formal employment, most of them tourism-based. However, an analysis of the frequencies reported by households in individual villages shows that there are important

variations in the distribution of the perceived livelihood activities and income sources. In Sehitwa, for instance, livestock farming was perceived as the most important livelihood activity. In most of the villages, there was a high diversity of rural livelihood systems, though agrarian livelihood systems (based on arable and livestock farming) were still perceived to be the most important. In the next section, we examine the income distribution of the Okavango livelihood systems.

## LIVELIHOOD INCOME PORTFOLIOS

This section summarises the results on livelihood income portfolios and per capita welfare benefits in the study areas. It is important to mention that the figures on income portfolios are very crude, since they are based on the recall method, and it is better to treat them as orders of magnitude rather than accurate figures.

### Income Portfolios

Table 3.4 shows the percentage composition of household income portfolios in the study areas. Despite the perception of arable agriculture by the Okavango households as the most important source of income, the analysis of income portfolios in the Okavango Delta does not show that this is the case. The most important source of income is formal employment (46% of the income), followed by government assistance programmes (9%), livestock farming (9%) and arable agriculture (5%). The table also shows that a high proportion of income (87%) in the study areas is derived from non-farm activities or sources such as formal employment, government assistance, collection of veldt products, basket making, and beer brewing.

**Table 3.4. Average Income for Various Activities per Month**

	N	Mean (P)	Estimated total income (P)	% income portfolio
Government assistance	53	234	12 402	9.3
Formal employment	41	1482	60 782	45.7
Basket making	53	83	4 399	3.3
Arable agriculture <sup>2</sup>	83	76*	6 308	4.7
Livestock farming	68	171	11 628	8.7
Remittances	25	226	5 650	4.2
Collection of veldt products for sale	14	156	2 184	1.6
Beer making	28	115	3 220	2.4
Thatching	10	264	2 640	
Drought relief projects	21	212	4 452	3.3
Fishing	5	323**	1 615	1.2
Other sources of income	16	1107	17 717	13.3
		319	132 997	100

Notes: Data based on information from field surveys. The survey has shown that per capita income obtained from arable agriculture was P36.00 per month. The figure was estimated from the amount of crops households said they produced. The physical figures were converted into monetary values by multiplying them by prices obtained from the Agricultural Marketing Board. The estimated figure was then doubled to take into consideration the amount of green crops eaten.

This suggests that there is high development of labour markets in the study areas. Only a small proportion of household income (13%) is derived from farm-based livelihood activities such as livestock farming and arable agriculture. There are also a number of natural resource-based livelihood activities such as basket-making, fishing, community based tourism, collection of veldt products (for home consumption and sale) and hunting. These livelihood activities are very important for household livelihood security.

These results are consistent with those of the study undertaken by BIDPA which revealed that subsistence agriculture is the most common livelihood activity, and they suggested that this reflected labour participation in this sector which has nothing to do with its economic contribution (BIDPA, 1997). The above results are also consistent with data from the 2002/03 Household Income and Expenditure Survey which shows that cash earnings from employment and unearned income accounted for as much as 44% to gross income in rural areas. The survey also showed that income from livestock farming and arable agriculture (defined as own produce consumed) accounted for 11% of total gross income in rural areas compared to our estimate of 13% (CSO, 2004). A comparison of the changes in income distribution in Botswana using the 2002/03 and 1992/3 Household Income and Expenditure Surveys shows that in rural areas cash income from employment and unearned income have increased from 41% to 44% and 0.3% to 8.9%, respectively. As a counterpoint, own produce or production from livestock and arable agriculture declined from 18% to 11% during the same period (CSO, 2004). These results support the "deagrarianisation hypothesis" since there is an indication that the proportion of non-farm household income has increased in comparison to that of the farm-based household incomes which is on the decline. These results are also consistent with those of the wider literature, which suggests that in southern African countries, households derive more than 50% of their income from non-farm activities (Ellis, 2000). Our estimate for the contribution of non-farm to total income falls within the range 80% to 90% which agrees with the estimate made by Ellis (1999) for southern Africa (Ellis, 1999).

## **CATEGORIES OF HOUSEHOLDS ACCORDING TO LIVELIHOOD ACTIVITIES**

This section examines livelihood activities according to categories of households. The categorization of households was done according to ethnicity, socio-economic status and social relations in terms of gender. The discussion on ethnicity examines livelihood activities associated with the main ethnic groups of Ngamiland such as the HaMbukushu, BaTawana, OvaHerero and Basarwa or San. As stated in the methodology, socio-economic categories of households included poor, middle and rich peasants. Regarding social relations, gender was the only determinant utilised in the analysis.

### **Ethnicity**

The Chi square Test of Independence revealed that there was an association between some of the livelihood activities and ethnicity in the study areas. Livestock farming was found to be more associated with BaTawana and OvaHerero rather than with the Basarwa, WaYei and HaMbukushu people. While 87 % of the BaTawana and OvaHerero said livestock farming was their primary livelihood activity, only 56% of the WaYei said

it was. The Chi square test showed an association between livestock farming and ethnicity at 5% level of significance ( $p=0.025$ , 1 df). Similarly, 87% of the BaTawana and OvaHerero said livestock farming was their livelihood activity as compared to 47% of the HaMbukushu. The Chi square Test showed an association between ethnicity and livestock farming, at 5% level of significance ( $p=0.05$ , 1 df). According to a number of studies, the BaTawana and OvaHerero people have always been associated with livestock farming in Ngamiland, hence the above findings strengthen the existing knowledge on this subject (Tlou, 2000; Bendsen & Meyer, 2003).

The involvement in arable agriculture is also associated with ethnicity. For instance, 67% of the HaMbukushu considered that dryland agriculture was their livelihood primary activity as compared to 54%, 59%, and 50% of the BaTawana, WaYei and Basarwa, respectively. There was association between ethnicity and dryland farming at 5% level of significance ( $p= 0.005$ , 1 df). Several studies have revealed that the HaMbukushu are associated with dryland farming, whereas the WaYei tend to practice *molapo* farming (Bendsen & Gelmroth, 1983). These results are also confirmed by other studies (Bendsen & Meyer, 2002), but this is the first study to determine the statistical significance of this association.

The above results suggest that the choice of livelihood activities is not only determined by the geographical location of households and economic factors, but also determined by cultural factors, and this is why the HaMbukushu and WaYei people have different farming systems even where they live in the same geographical locations (e.g. Etsha 6) This suggests that household impacts of shocks will also be different for different ethnic groups. For instance, changes in flooding patterns and desiccation of river channels will tend to affect the WaYei more than the HaMbukushu people in Etsha 6, as they are practice *molapo* farming, which is dependent on flooding. On the other-hand, drought will tend to have a greater impact on the *HaMbukushu* communities since they practice dryland farming, which is rainfall dependent. In Sehitwa, which is predominantly a livestock area, drought and animal diseases will tend to affect the BaTawana and OvaHerero people more than other ethnic groups since they are more dependent on livestock farming, which is rainfall dependent and prone to animal diseases.

### Socio-Economic Status

There was an association between socio-economic status, involvement in livestock farming, and formal employment. While involvement in livestock farming and formal employment were associated with the rich households, involvement in basket making and beer-making seemed to be statistically associated with the poor households. For instance, 79% of the rich households said livestock farming was their source of livelihood, as compared to only 48% and 35% of the middle and poor households, respectively. The Chi square Test showed a strong association between socio-economic status and livestock farming ( $\chi^2= 16.4$ ,  $p= 0.00005$  (2 df). Formal employment was also found to have an association with socio-economic status at 5% level of significance ( $p < 0.0005$ , 2 df). Thus the percentage frequencies of the involvement in formal employment tended to increase as socio-economic status increased, suggesting that those who were involved in this livelihood activity were in a much better position to acquire assets.

Of the total number of those involved in basket making, 28% of them were rich households as compared to the proportion of the middle and poor households of 34% and 52%, respectively. However, the Chi square Test showed that there was no statistical

significance at 5% level of significance to provide sufficient evidence that there was an association between basket-making and socio-economic status existed ( $p = 0.078$ , 2 df). Similarly, there was also no association between beer brewing and socio-economic status, though the contingency table showed that the frequencies of those who brewed beer tended to decrease as socio-economic status increased. Of those who were involved in the sale of beer brewing, 26% of them were the poor households as compared to the proportions of the middle and rich households of 19% and 11%, respectively. The above findings seem to suggest that formal employment and livestock farming are associated with rich households, whereas basket-making and beer brewing are associated with poor households. However, a firm conclusion cannot be drawn since there is no significant statistical relationship.

## Gender

Participation in livelihood activities by different members of the households was also determined by gender. These activities included permanent destitute allowance, drought relief/labour intensive public works, beer brewing, and basket-making. The association between gender and these livelihood activities is discussed below.

Of the total number of households who said they received permanent destitute allowance, 13% of them were female-headed households as compared to 8.6% of the male-headed households. However, the Chi square Test showed no statistical significance (at 5% level) that access to permanent destitute allowance and type of household according to household gender ( $p = 0.06$ , 2 df). It was also revealed that the proportion of poor households who obtained permanent destitute allowance was higher (18%) than that of the rich peasants (15%), though these proportions were not statistically significant. The District Drought Committee progress reports for the sub-districts of Ngami and Okavango, and our own observations, also revealed that women tended to outnumber men in drought relief/labour intensive public works. During the period 2003/2004, 80% of those who participated in these projects in Ngami sub-district were women. Similarly, a higher proportion (65%) of those who participated in these projects in Okavango sub-district during the period 2002/2003, were women. Studies in other parts of Botswana also show that women are more likely to be involved in labour intensive public works programmes (LIPWP) than men. According to Gobotswang *et al* (2002), the proportion of women who participated in LIPWP in Botswana increased from 24% in 1986 to 75% in 2000. The rise in the participation of women in LIPWP during this period was attributed to changes from construction based activities to those of maintenance (Gobotswang *et al.*, 20002).

Informal interviews with those who coordinated these drought relief/LIPWP projects in Shorobe showed that most of the women participants were the heads of households, who tended to be resource poor. It was also revealed that women tended to have a higher participation because they have a lower opportunity cost of labour as compared to men, as they have less access to employment opportunities. Thus, they have a higher participation rate in these programmes because they do not have as many options as men who can easily resort to other manual jobs, such as cutting wood and digging. Because men had alternative options, they had a lower participation in drought relief/LIPWP projects as they are poorly paid (they were paid P10 per 6-hour day). The poverty of female-headed households could partly result from the fact that they tend to be larger household sizes than male-headed households (Gobotswang *et al.*, 2003).



Focus group discussions and our observations also revealed that livelihood activities such as beer brewing, basket making, and collection of grass for sale were associated with women rather than men, and these activities give much lower incomes. In addition, the majority of women who are involved in basket making are female-headed rather than male-headed households. According to Terry (1986), 57% of the 60 weavers interviewed in Gumare and Tubu were from households headed by women. This strengthens the above finding that those involved in basket making tend to be the poor households such as female-headed households who are among the poorest groups in Botswana (BIDPA, 1997).

## CONCLUSION

### Access to Capitals

The results suggest that access to financial, physical and human capital is limited in the study areas and this has an adverse effect on the improvement of livelihood prospects. For instance, Ngamiland District has a literacy rate that is lower than the national one. This constrains development in the District as education plays a key role in improving livelihood systems. Poor infrastructure in rural areas is also one of the factors contributing to poor livelihood security: limiting access to markets, flow of information and the delivery of agricultural inputs and outputs. The other challenge is limited access to human capital, and the situation is aggravated by the HIV/AIDS pandemic. In addition, financial capital formation is also a challenge due to lack of credit and financial institutions. Although access to social and natural capital is not currently a serious problem, there is evidence that these forms of capital are in decline in the Okavango Delta, hence the need for their conservation.

### Patterns of Livelihood Activities

The chapter has shown that subsistence agriculture is still perceived to be a very important livelihood activity in the Okavango Delta, despite the fact that its contribution to household incomes is generally low. The low contribution of agriculture to household income also applies to the wider economy of Botswana. Botswana, like other sub-Saharan African countries, is increasingly becoming less agrarian due to an increase in non-farm livelihood activities. Although there is insufficient data to determine whether the process of de-agrarianisation is also occurring in the Okavango Delta, the patterns of socio-economic development in the Okavango Delta suggest that this is likely to be the case, mainly because of the impact of tourism development. The chapter has also revealed that livelihood activities vary according to socio-economic status and geographical location in the Okavango Delta. This finding supports the recommendation by Ellis (2000) that it is essential to have an understanding of the local situation before formulating local policies and projects.

## **Dependence on Social Welfare Programmes**

Many households are increasingly relying on government assistance (food rations, old age pension etc), which acts as an important safety net. The unreliability of the supplies of these food rations to some of the remote areas, such as Seronga and Gudigwa, is a factor that can easily increase the vulnerability of those affected by poverty. However, there is evidence that overall, social welfare schemes have made a contribution to poverty alleviation in the Okavango Delta. However, these programmes have disadvantages as well. Those who participate in these programmes tend to have a disincentive to work in arable agriculture. There is also a general criticism that, although these programmes make a substantial contribution to poverty alleviation, they result in the creation of low quality infrastructure and also tend to create a dependency syndrome in Botswana. Wilk and Kgathi (2007:121) are of the view that social security plays a major role in Botswana, particularly because social capital is declining. However, they suggest that it should be used rather sparingly and also not “at the expense of creating viable livelihood options through increased investment, education and access to markets”.

## **Implications For Policy**

These results have a number the following policy implications. First of all, poverty policy should take into consideration the diversity of rural livelihoods and take cognizance of the fact that agriculture is not the engine of economic growth in Botswana. The Government is currently subsidizing subsistence arable agriculture even though the country does not have comparative advantage for it. This is mainly because of unreliable rainfall, poor soils and poor access to markets in urban areas due to the poor terrain of the roads. Although it is a good idea to support the production of subsistence agriculture in order to promote the livelihoods of poor rural households, it is also essential to ensure that the more productive non-farm sector is not ignored by Government policy. Rural-urban migration should not only be viewed in a negative sense by poverty policy as the promoter of urbanization, but its positive contribution to rural development in the form of remittances should also be taken in consideration. The other challenge is the distortion of created by the subsidization of subsistence agriculture which tends divert labour from the more productive non-farm sector to the less productive sector of arable agriculture. Finally, there is a need to strengthen human, physical, and financial capital in rural areas of the Okavango Delta and also to ensure that social and natural capital are conserved as there is an indication that these forms of capital are being degraded.

## **REFERENCES**

- Abel, N.O.J., Blaikie, P.M. (1988). *Managing common property resources in rural development: the case of Zimbabwe and Botswana*. Norwich: Overseas Development Group, UEA.
- Ashley, C., & Maxwell, S. (2001). Rethinking rural development. *Development Policy Review*, 19(4), 395-425.
- Balihuta, A. M., & Sen, K. (2001). Macro-economic policies and rural livelihood diversification: a Ugandan case study. *Ladder Working paper*.

- Bar-On, A. (2002). Going against world trends social protection in Botswana. *The Social Policy Journal*, 1(4), 23-41.
- Barrett, C. B., Reardon, T., & Webb, P. (2001). Non-farm income diversification and household livelihood strategies in rural Africa: concepts, dynamics, and policy implications. *Food Policy*, 26, 315-331.
- Bendsen, H. & Gelmroth, H. (1983). Land use planning Ngamiland. Maun, *CFDA*, MLGL, TLB, NWDC.
- Bendsen, H., & Meyer, T. (2003). *The dynamics of the land use systems in Ngamiland, Botswana: changing livelihood options and strategies*. Paper presented at the Environmental monitoring of tropical and sub-tropical wetlands, Maun, Botswana.
- Botswana Institute of Development Policy Analysis (BIDPA) (1997). Study of poverty and poverty alleviation in Botswana. Gaborone, Botswana: Ministry of Finance and Development Planning.
- Bryceson, D. F. (2002). The scramble in Africa: reorienting rural livelihoods. *World Development*, 30(5), 725-739.
- Central Statistics Office (2008). Revised 2004 Botswana agricultural census report. Gaborone: Central Statistics Office, Ministry of Finance and Development Planning.
- Central Statistics Office (2004). Household income and expenditure survey. Gaborone: Government Printer.
- Central Statistics Office (2002). *National population and housing census 2001*. Gaborone: Ministry of Finance and Development Planning
- Chambers, R., & Conway, G.R. (1992). *Sustainable rural livelihoods: practical concepts for the 21st century*: Institute of Development Studies.
- Conway, G.R., & Barbier, E.B. (1990). After the green revolution: sustainable agriculture for development. London: Earthscan Publications Ltd.
- DFID (1999). *Sustainable livelihood guidance sheets*. Accessed May 2010. [http://www.livelihoods.org/info/info\\_guidanceSheets.html](http://www.livelihoods.org/info/info_guidanceSheets.html).
- Ellis, F. (1998). Household strategies and rural livelihood diversification. *Journal of Development studies*, 35(1), 1-38.
- Ellis, F. (1999). Rural livelihood diversity in developing countries: evidence and policy implications. *ODI Natural Resources Perspectives, working paper number 40*. Retrieved from <http://www.odi.org.uk/nrp/40.html>.
- Ellis, F. (2000). *Rural livelihood diversity in developing countries*. Oxford: Oxford University Press.
- Ellis F., & Allison, E., (2004). Livelihood diversification and natural resource access. Livelihood Support Programme Working Paper No 9. FAO, Rome.
- Farrington, J., Carney, D., Ashley, C. & Turton, C., (2004). Sustainable livelihoods in practice: early applications of concepts in rural areas. In Jones, S. & Carswell, G (Eds), *The Earthscan reader in environment, development and rural livelihoods*. London: Earthscan.
- Gobotswang, K. S. M., Marks, G.C., & O'Rourke, (2002). Participation in labour-intensive public works programme (LIPWP): effect on staple crop production in south-eastern Botswana. *Food and Nutrition Bulletin*, 23(4), 413-420.
- Hamoudi, A., and N. Birdsall. 2002. *HIV/AIDS and the Accumulation and Utilization of Human Capital in Africa* (Working Paper No. 2). Washington, D.C.: Center for Global Development.
- Hussein, K., & Nelson, J. (1998). Sustainable livelihoods and livelihood diversification. *IDS Working Papers, IDS working paper number 69*.

- Kgathi, D. L., Ngwenya, B.N., & Wilk, J. (2007). Shocks and rural livelihoods in the Okavango Delta. *Development Southern Africa*, 24(2), 289-308.
- Levy, H., & Sarnat, M. (1970). International diversification of investment portfolios. *The American Economic Review (AER)* 60(4), 668-675.
- Ministry of Local Government (2002). Revised national policy on destitute persons. Gaborone, Government Printer.
- North West District Council, (2009). Ngamiland District Development Plan 7: 2009-2016. Maun: Ministry of Local Government.
- Rashem, K. (1988) *Economic findings and results: dryland and molapo farming systems of western Ngamiland*. Gumare, Agricultural Development Ngamiland, Technical Report.
- Scoones, I. (1998) Sustainable rural livelihoods: a framework for analysis. *IDS working paper 72*. London: Institute of Development Studies.
- Terry, M.E., 1999. The economic and social significance of the handicraft industry in Botswana. Unpublished PhD thesis. School of Oriental and African Studies, University of London, London.
- Tietenberg, T., 1992. *Environmental and Natural Resource Economics*.
- Tietenburg, T. (1996) *Environmental and Natural Resource Economics*. New York, Harper Collins College Publishers.
- Tlou, T. (2000). A History of Ngamiland. 1750 to 1906: the formation of an African state Gaborone: MacMillan Publishers.
- United Nations Development Program (2009). Human development report. New York: United Nations Development Program.
- United Nations Development Program (2005). Human development report: harnessing science and technology for human development. New York: United Nations Development Program.
- Wilk, J., & Kgathi, D.L. (2007). Risk in the Okavango Delta in the face of social and environmental change. *GeoJournal*, 70, 121-132.
- World Bank (2009). *World development report*. Washington DC: World Bank.