

POVERTY REDUCTION THROUGH ALTERNATIVE LIVELIHOODS IN BOTSWANA'S DESERT MARGINS

P. Malope and K.R. Molapisane¹

Correspondence author: P. Malope, Department of Agricultural Economics, Education and Extension. Botswana College of Agriculture, Private Bag 0027, Gaborone, Botswana. Tel: (0267) 3650239 Fax: (0267) 3928753, E-mail: pmalope@bca.bw

Keywords: Alternative livelihoods, poverty reduction, veldt products, desert margins.

ABSTRACT

Despite rapid economic growth recorded in the last decades following independence in 1966, poverty is still rampant especially in the rural areas of Botswana. Poverty reduction has been on the agenda for many years and poverty reduction strategy has mainly concentrated on the improvement of both agricultural production and productivity since the majority of the population residing in the rural areas depend mainly on agriculture for their livelihoods. The findings of this study indicate that there are other livelihood options available in the rural areas which might help government in its efforts to reduce poverty. According to the study, there are several livelihood options available in the desert margins of Botswana, but communities fail to exploit these due to a number of constraints such as poor access to financial credit, lack of awareness of potential income earners such as eco-tourism, insufficient knowledge and technical expertise. Hence government efforts aimed at improving access to financial credit and creation of awareness on potential income earners apart from agriculture are likely to succeed in reducing poverty in the rural areas.

1. INTRODUCTION

In most developing countries agriculture is still the mainstay of the economy both in terms of its contribution to Gross Domestic Product (GDP) and employment. For instance in most parts of sub-Saharan Africa agriculture contributes about 40% of GDP and employs the majority who live in the rural areas. In Botswana, although the

¹ Lecturers, Department of Agricultural Economics, Education and Extension. Botswana College of Agriculture, Private Bag 0027, Gaborone, Botswana. Tel: (0267) 3650239 Fax: (0267) 3928753, E-mail: pmalope@bca.bw

agricultural sector's contribution to GDP has fallen from 40% at independence in 1966 to a mere 2.1% in 2001, the sector still remains an important source of food, income and employment for the majority of the population living in the rural areas (Ministry of Finance and Development Planning (MFDP, 2003a:174).

However, within the rural areas of Botswana, other non-agricultural activities are being practised in order to supplement the income derived from agricultural activities. These activities include beer brewing; selling of firewood and non-timber products. Non-agricultural activities become very important in the desert margins areas where agricultural production is not only risky but also very poor. In areas like these non-farm activities become a very important component of rural dwellers' income and hence contribute positively to raising the living standards of the poor. Ellis (1999:1) argued that agriculture on its own is increasingly unable to provide sufficient means for survival in rural areas of developing countries. Hence policies aimed at reducing poverty which is more rampant in the rural areas should not only aim at improving agricultural production and productivity.

The extent to which non-farm activities contribute to rural household income is not clear, especially in the desert margins where agricultural production is quite low. Therefore, the main objective of this paper is to identify and develop an inventory of economically viable livelihood options in the desert margins of Botswana. The paper will also identify socioeconomic constraints to adoption of economically viable livelihood options.

2 METHODOLOGY

2.1 The study area

The study was conducted in the eastern (Bobirwa sub-district) and in the southern (Kgalagadi District) part of Botswana. The Bobirwa sub-district is located in the hard veldt and Kgalagadi is situated in the sand veldt region. A deliberate effort was made to include two different areas, one in the sand veldt and the other in the hard veldt because the soils, vegetation and climatic conditions differ. For example, in the sand veldt soils are derived mostly from Precambrian rocks and are sandy, whereas in the hard veldt soils are predominately of late tertiary

Aeolian origin and are predominately loams to sandy loams. The Kgalagadi district has a mean annual rainfall of about 250 mm while the Bobirwa district has an annual rainfall of between 300-400 mm (Kayombo *et.al*, 2001:3). The two areas were also chosen because these are the areas in which the Desert Margins Programme in Botswana is operating.

2.2 Target population and sample size

The target population for this study was all households in the study area. The unit of analysis was the household. The villages included in the study were: Mathathane, Motlhabaneng and Tsetsejwe in Bobirwa where 98 households were sampled and Tsabong, Hukunsi and Tshane in Kgalagadi where 120 households were selected.

2.3 Data collection

Data was collected in July and August 2003 through a structured questionnaire administered to sample respondents through the help of enumerators specifically trained for the job and familiar with the language spoken in the study area.

2.4 Data analysis

Data analysis was done through frequency tabulations using the statistical package for social scientists (SPSS).

3. RESULTS AND DISCUSSIONS

3.1 Socioeconomic characteristics

As indicated in Table 1 a total of 218 respondents were interviewed, 98 (45%) in Bobirwa sub-district and 120 (55%) in Kgalagadi District. The majority (65%) of the respondents were male, with a larger proportion (83%) in Kgalagadi district. The main reason for a higher number of male respondents was that Botswana is a patrilineal society hence when one enters the household home he/she will normally be referred to a male, who is considered the household head. Respondents were predominantly over 40 years of age implying that the farming community was comprised of older people.

Table 1: Socioeconomic characteristics of respondents in the target districts of Botswana (2003)

Characteristic	Bobirwa (n=98)		Kgalagadi (n=120)		Total	
	Fre- quency	Percent	Fre- quency	Percent	Fre- quency	Percent
Gender						
Male	42	43	100	83	142	65
Female	56	57	20	17	76	35
Age (Years)						
>30	9	9	15	13	24	11
31-40	6	7	37	31	43	20
41-50	23	23	26	22	49	22
51-60	24	24	11	8	35	16
61-70	26	27	19	16	45	21
71+	10	10	12	10	22	10
Marital status						
Single	30	31	56	47	86	40
Married	40	41	45	37	85	39
Divorced	5	5	1	1	6	3
Widowed	20	20	7	6	27	12
Cohabiting	3	3	11	9	14	6
Education						
None	36	37	24	20	60	28
Primary	42	43	59	49	101	46
Secondary	14	14	32	27	46	21
University	1	1	3	2	4	2
Non-formal	5	5	2	2	7	3
Area planted (ha)						
0	6	6	72	60	78	36
1-5	22	22	25	21	47	22
6-10	29	30	20	17	49	22
11-20	26	27	0	0	26	12
20+	15	15	3	2	18	8

Most respondents were either single (39%) or married (38%), followed by those who are widowed (12%) and cohabiting (6%). Only three percent reported to be divorced. Regarding educational attainment, the majority of the respondents (69%) had formal schooling. Of these, 46% had primary education, 21% had secondary education, and only two

percent had post-secondary education. A sizable proportion (28%) had no schooling, while three percent attended non-formal school.

3.2 Farming activities

The main farming activities undertaken in the two districts are arable field crop production and livestock farming. These activities are mainly undertaken in the tribal/communal land. The majority (60%) of respondents in Kgalagadi did not plough their fields compared to only six percent in Bobirwa. The main reason for this is that Kgalagadi district has low rainfall and poor soils, hence is not suitable for arable agricultural activities. Instead agricultural activities in the Kgalagadi District are focussed on livestock farming.

All the respondents indicated that they owned at least one type of livestock. However, they were reluctant to disclose how many livestock they had; hence it was not possible to determine the average herd size. The most predominantly kept livestock was small stock (sheep and goats), which was owned by 98% of the respondents. Small stock is kept mainly for meat, milk and sale, in order of importance. Cattle ownership follows that of small stock, with 71% of the respondents owning some. Donkeys were owned by 67% of the respondents, while 11 % owned other livestock other than those already mentioned above.

3.3 Sources of income other than farming

In Kgalagadi District, the majority of the respondents (63%) reported that there were no alternative income sources, other than agriculture. In Bobirwa, 25% reported lack of alternative income sources. For those who indicated there were other sources of income, these varied from paid employment, remittances, and old age pension² in order of importance. Other sources of income included part time jobs, beer brewing and small scale general dealership.

Surprisingly, none of the respondents mentioned sale of veldt products as an alternative source of income, though it is widely known that in Kgalagadi sengaparile (grapple plant – *Hapargophytum*) is being harvested and sold by the locals. The reason why the respondents in

² The old-age pension is provided by the Government of Botswana to people over 65 years of age.

Kgalagadi did not mention sale of sengaparile as an alternative source of income might be that harvesting is usually done by remote area dwellers and the interviewers were not able to reach them.

In Bobirwa, the harvest and sale of phane (*Imbrasia belina*) is also an important source of income. Possibly, the respondents did not identify it as such because it is predominantly harvested for home consumption and is sold only when there is surplus. Thus, phane is not seen as an income generating activity rather it is used to supplement household food requirements.

According to Table 2, small scale general dealership is the most popular (61) livelihood in Kgalagadi, while beer brewing is the most important option (22) in Bobirwa. Other viable options are harvesting forest products and hawking.

Table 2: Alternative livelihood options by district as indicated by respondents (2003)*

Options	District		
	Bobirwa (n=56)	Kgalagadi (n=133)	
	Frequency (n)	Frequency (n)	Total
Forest products	17	13	30
General dealer	3	61	64
Hawking	6	24	30
Beer brewing	22	13	35
Eco-tourism	0	6	6
Other	8	16	24

* Multiple responses possible

Surprisingly eco-tourism was thought to be the least available livelihood option even though the two areas have abundant wildlife resources. The two areas have in their midst Mashuta Game Reserve (Bobirwa) and Trans-Kgalagadi Frontier Park (Kgalagadi). Furthermore in Bobirwa, especially in the Tuli Block region, some commercial farmers practise game farming. It was therefore surprising to learn that communities do not view eco-tourism as a livelihood option. Ellis, (1999:2) found that 80-90% of rural household income in southern Africa is derived from non-farming sources and reliance on agriculture

tends to diminish as income levels rise. Moreover, the more diverse the sources of income, the better-off the rural households will be.

3.4 Forests products in the desert margins and their uses

A majority (74%) of the respondents indicated that they used the forest products for family consumption only. Only eight percent of the respondents indicated that they harvested the forest products solely for sale, whereas 22% used them for both family consumption and sale. Table 3 indicates the forest products available in the two districts. All the forests products available in Bobirwa are also available in Kgalagadi, exceptions being phane (only available in Bobirwa) and sengaparile (only found in Kgalagadi).

It is evident from Tables 3 and 4 that forest products found in the desert margins are edible with the exception of firewood, which provides a source of energy for household cooking, thatching grass which is utilised for building purposes and poles/trees which are used for fencing. It can therefore be concluded that the forest products form a major part of the diet of the communities living in the desert margins. Other forest products have medicinal properties like sengaparile, which is mainly harvested for commercial purposes.

Table 3: Availability of forest products by district

Bobirwa Sub-District	Kgalagadi District
Moretlwa (<i>Grewia spp.</i>)	Moretlwa (<i>Grewia spp.</i>)
Mmilo (<i>Vangueria infausta</i>)	Mmilo (<i>Vangueria infausta</i>)
Morula (<i>Sclerocarya birrea</i>)	Morula (<i>Sclerocarya birrea</i>)
Mahupu (truffles – <i>Terfezia pfeilli</i>)	Mahupu (Truffles – <i>Terfezia pfeilli</i>)
Morama (<i>Tylosema esculentum</i>)	Morama (<i>Tylosema esculentum</i>)
Phane (<i>Imbrasia belina</i>)	Sengaparile (grapple - <i>Hapargophytum</i>)
Firewood	Firewood
Poles for fencing	Poles for fencing
Thatching grass	Thatching grass

3.5 Nature, current and potential uses of forest resources

As indicated in Table 3, forest products found in the desert margins have a variety of current as well as potential uses. Moretlwa (*Grewia*

Table 4: Uses of forest products found in the desert margins

Product	Uses
Moretlwa	Raisin, snack and beer brewing
Mmilo	Snack
Morula	Fruit, fruit juice, jam, puree, beer and sweets
Mahupu	Nutritious food for human consumption
Morama	High protein and important dietary supplement
Phane	Source of animal protein and livestock feed
Firewood	Energy for cooking
Poles	Fencing
Grass	Thatching

Source: Arnold, (1998:4)

spp.) is a woody shrub which bears berries in the summer. The berries are available fresh in the summer (February to May) and dried throughout the rest of the year (Arnold, 1998: Appendix IV). Newly picked, they are eaten as a snack and used in beer brewing (khadi). The berries are often dried and made into raisins, which are sold. Being a summer season fruit, the berries can be harvested and dried, and be sold for a higher price during the off-peak moretlwa season. Though currently used for beer brewing, there is also potential to utilize the berries in commercial beverage production as a community project. Other than being a food value plant, moretlwa can also be used as livestock fodder, and has been identified to help maintain soil fertility (Arnold, 1998: Appendix II).

Mmilo (*Vaangueria infausta*) is a fleshy fruit, which is eaten as a snack, either fresh or dried. With good rains, the yield per tree is quite high. This can potentially be made into fruit bars and jam. Morula (*Sclerocarya birrea*) fruit is juicy and can be eaten fresh or made into secondary products such as fruit rolls, jam, juice and sweets (Arnold, 1998:4). The morula nuts can be eaten as a snack but also have the potential of being pressed into oil. Mahupu (*Terfizia pfielii*) is a tuber plant, which is not only used for food consumption, but also as a source of water. It can be consumed fresh or pickled. Morama (*Tylosema esculentum*) fruit is eaten fresh or dried. It is available fresh during the months of February to April, and dried for the rest of the year.

Phane (*Imbrasia belina*) is caterpillar with a high protein content, which though commonly utilized for home consumption, is now more commonly sold commercially (Allotey *et.al*, 1999:2). Phane is harvested during the months of December and April, but is available throughout the year dried. Singaparile (*Harpagophytum procumbens*) is a tuber plant with medicinal characteristics. It is mainly used for treatment of arthritis and stomach ailments (Arnold, 1998: Appendix III). It is available fresh through the months of April to October, and dried for the rest of the year. As already mentioned, sengaparile is already available in the international markets, and therefore has great potential as an income source for the rural communities. Firewood is mainly used for family consumption in rural areas, however, in peri-urban areas firewood sale is an important source of income. Strategically planned and marketed, rural communities could sell firewood to retail stores in towns and cities. Sale of thatching grass is another area with great potential in the advent of promotion of tourism in southern Africa. Currently thatching grass is harvested on demand and only for family use.

3.6 Potential for value addition

Although most of these forest products are mainly used as raw products, most have a potential for value addition through processing. This processing should be done at regional or district level to economically empower the local communities. For example, currently in Kgalagadi, locals harvest and sell sengaparile to Thusanyo Lefatsheng, where it is processed into either powder or pills and is then sold, both locally and internationally. Just over half (53%) of the respondents who sell their products add value to their products through processing. However, the only processing done is drying and bottling. The majority of the respondents sell the forest products in their own locality, thus buyers come and buy the products at harvesting sites. More exposure and exploitation of new markets is therefore possible.

3.7 Potential markets

Potential markets exist mainly in urban areas and developed countries for semi-processed and processed products. For example, sengaparile is sold in semi-processed form to Europe. Other products also have

potential markets in Europe and North America especially those with medicinal properties. However, the local marketing system for veldt products is still undeveloped with a few buyers dictating prices to harvesters. These buyers then process the products into semi and finished products for sale in the international market at very high prices. Mogotsi *et.al* (2005:8) reports that the international market value for sengaparile is tremendously higher than the value the local harvesters get. The bulk of dried sengaparile is exported to Germany and France for further processing before being exported to North America.

3.8 Resource use sustainability

Out of the 150 respondents who indicated that they harvested these forest products, 93% indicated that they did not need a permit to harvest these resources. Thus, harvesting is done freely without any limit as to how much of the resource can be harvested at a particular time and the frequency of harvesting. This cast doubt as to whether proper harvesting techniques and rates are being practised because being an open access resource, forest products are prone to over harvesting and subsequent extinction.

The remaining respondents indicated that they require permits for harvesting some of the forest products. This is true of sengaparile in the Kgalagadi district. The permits are issued by the Agricultural Resources Board (ARB) in Tsabong and indicates the amount one should harvest. From personal interview with ARB Secretary the harvesters are also advised on how to harvest the products in a sustainable manner. However, it has proved difficult for ARB to monitor whether the harvesters do not exceed the quantities allocated to them and follow sustainable methods of harvesting the veldt products. Instances where the whole plant has been uprooted have been noticed and indeed some of the respondents have admitted that they uprooted the whole plant when harvesting sengaparile.

3.9 Constraints to venturing into alternative livelihood options

Having identified the available livelihood options, respondents were asked to indicate obstacles that prevented them from engaging in the livelihood options they had identified. As shown in Table 5 a majority

(56) of the respondents indicated that lack of funds was a major obstacle preventing them from venturing into the available livelihood options in their areas. The problem is compounded by the fact that the majority (62%) of the respondents indicated that they were not aware of any credit institution in their areas and only 19% used commercial banks to obtain agricultural credit. The major reason for this being lack of knowledge of existing credit institutions and lack of assets to use as security or collateral against the loans obtained from financial institutions.

Table 5: Constraints to venturing into alternative livelihoods as mentioned by respondents (2003)

Constraint	Frequency
Lack of funds	56
Insufficient knowledge and training	22
Insufficient government support	17
Others	10

The other obstacles mentioned were insufficient knowledge and training (22), insufficient government support (17); and others (10). Thus, some respondents were prevented from venturing in potential income generating activities such as eco-tourism because of insufficient knowledge about eco-tourism as a potential income earner. Low human capital, in the form of education and training, acts as a barrier to venturing into alternative livelihoods such as eco-tourism and others. The fact that the majority of respondents (64) view small scale general dealership as a major livelihood option lends further support to the fact that they have insufficient knowledge of potential income earners present in their areas such as ecotourism and veldt products.

Although a huge potential exist in harvesting, processing and marketing of veldt products, communities fail to exploit this potential because of a variety of reasons. Chief among these is that the communities are either not aware of the existence of the international market and the prices it offers and/or lack the processing skills required by international consumers.

3.10 Potential for poverty alleviation through the use of veldt products

According to Arnold (1998:5) most users of veldt products in Botswana are from the poorer social strata particularly in the west and north of the country where alternative opportunities are limited and cash incomes low. According to Sack (1997) as cited by Arnold (1998:6) veldt products are the third major source of income after livestock and crop cultivation in western parts of Botswana. Rural Industries Innovation Centre - RIIC (1997), cited by Arnold (1998:6) also found that the main users of veldt products are poor members of the community, and that they depend on veldt products due to lack of access to alternative sources of livelihood. Women also rely more on veldt products, for household consumption and cash income, than men. The other groups of users are traditional healers and a growing number of urban consumers.

MFDP (2003b:4) indicates that drought and resultant high risk for investment in farming, inadequate skills and knowledge, both for formal and productive self-employment, and poor natural endowments for arable agriculture, (which in many parts of the world has provided a means out of poverty) are some of the causes of poverty in Botswana.

In order for veldt products to bring any meaningful contribution to poverty reduction in the rural areas, obstacles and constraints that hinder veldt product harvesters from venturing into commercial harvesting should be addressed. These should include the development of both the local and international markets, training of rural communities in proper harvesting techniques and development of appropriate technologies for processing of veldt products into forms desired by both the local and international consumers.

4. CONCLUSIONS

The findings of this study indicate that agriculture is a major activity in Botswana's desert margins. In the Kgalagadi district the main agricultural activity is livestock farming while in Bobirwa the main activity is arable production. In addition to agricultural production communities in the study area have a number of alternative livelihood options that they can undertake. Some of these livelihood options

involve exploitation of natural resources both timber and non-timber products. The major uses of these forest products are for family consumption with the notable exception of phane and sengaparile, which are harvested for commercial purposes. All the products however, have the potential to be produced and sold commercially.

However, there are a number of constraints that prevent the communities from fully exploiting these opportunities. These constraints include among others, a low human capital and asset base for the poor. For example, the poor do not venture into alternative livelihoods because they do not possess skills and the ability to navigate bureaucratic hurdles that are normally present in acquiring services (Ellis, 1999:2). In addition a low asset base prevents the poor from obtaining credit in order to venture into alternative livelihood options.

Diversity of livelihoods through exploitation of veldt products is an important feature in poverty reduction strategies of developing countries but it is often overlooked. Thus for poverty reduction strategies to be successful there is a need to take into account the available livelihood options in the rural areas. After identifying the viable livelihood options efforts must be made to counteract obstacles that prevent the poor from venturing into these livelihood options. These would include the creation of rural credit institutions that are not only self-sustaining but also understand the needs of rural borrowers. In addition there is a need for human capital development through education and training so that the rural dwellers are sensitised of the available livelihood options.

5. REFERENCES

ALLOTEY, J., MPHUCHANE, S.F., GASHE, B.A., DITHLOGO, M., TEFERRA, G., SIAME, B.A., SIMPANYA, M.F. & COLLISON, E., 1999. *Current status of the Mophane worm industry: Impact on the population and implication for the future*. Department of Biological Sciences, University of Botswana, Gaborone, Botswana. From <http://www.iff.ac.at/socec/affil/conference99/pdf/rpAllotey.pdf>

ARNOLD, C., 1998. *Review of veldt product utilization in Botswana*. Botswana Rangeland Inventory and Monitoring Project. Ministry of Agriculture. Gaborone. Botswana.

ELLIS, F., 1999. *Rural livelihood diversity in developing countries: Evidence and policy implications*. Natural Resources Perspectives, No. 40, Overseas Development Institute. <http://www.odi.org.uk/nrp/40.html>.

KAYOMBO, B., MEULENBURG, F., MOGAGANE, B.G., PATRICK, C., GABOUTLOELOE, G & MACHACHA, S., 2001. *Desert margins programme: Botswana component*. Final Technical Report

MINISTRY OF FINANCE AND DEVELOPMENT PLANNING, 2003a. *National Development Plan 9, 2003/04-2008/09*. Ministry of Finance and Development Planning. Government Printer, Gaborone.

MINISTRY OF FINANCE AND DEVELOPMENT PLANNING, 2003b. *Strategy for poverty reduction of 2003*. Ministry of Finance and Development Planning, Government Printer. Gaborone

MOGOTSI, K.K., BALOLE, T.V., MOJEREMANE, W., MALOPE, P., MASHUNGWA, G., MODISE, D.M., TIBE, O. RAMOLEMANA, NSINAMWA, M. & LEGWAILA, G., 2005. *Review of domestication and commercialization of new crop species for Botswana*. Sustainable Strategies for Development of Commercial Crop Production in Botswana, Department of Crop Science and Production Conference. Botswana College of Agriculture. Gaborone. Botswana. 6-8 September 2005.

RURAL INDUSTRIES INNOVATION CENTRE & BOTSWANA TECHNOLOGY CENTRE, 1997. *Report on the existing veldt products and associated processing and preservation techniques in Khekhenye and Motokwe – Kweneng west*. Veld Products Research, Gabane, Botswana.

SACK, R., 1997. *Baseline socio-economic survey: Community-based management of indigenous forests projects in Motokwe, Khekhenye and Tshwaane*. Veld Products Research, Gabane, Botswana.