

New opportunities for combating desertification in Botswana: Women in action for sustainable land and natural resources management

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Background

Botswana is endowed with a vast land of approximately 581,730 km². Up to 488,654 km² (84%) is covered by the dry savanna or the Kgalagadi (Kalahari) desert. In the northwest, the Okavango river drains inland from Angola to create 17 000 km² of wetlands, (the Okavango Delta) within the desert. The Delta is one of the largest inland wetlands in the world. One may describe the Kgalagadi desert ecosystem as; a network of semiarid to arid environments intermingled with wetlands of the Okavango, the Chobe watershed of mixed woody trees species and palms, (*Hyphaene petersiana*). This ecosystem also consists of the sand dunes in the south to south west, sparse grasslands, mopane (*Colophospemum mopane*) woodlands in the north and *Acacia* species across the country to the Makgadikgadi and Nxai salt pans. This translates to a very fragile ecosystem that carries over 3,000 plant species, 164 mammalian, 157 reptiles, 550 birds species, a large numbers of insects. The people of Botswana have derived food, fibre, fuel, medicine, jewelry, fodder, hides and trophies and other livelihoods from these indigenous resources. However, all cultivated plant species, except *citrullus lunatus* (melons) and all livestock reared in the country are exotic. Production of these has been intensified over the years, leading to land degradation, deforestation, overgrazing, bush encroachment and neglect of research and development on sustainable production, land and natural resources management. Protection and utilization of land and natural resources management has been a challenge. The country has therefore, undertaken several measures towards promoting a sound management of the environment and its natural resources. These measures include policies and legislation for managing

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the effects of desertification through sustainable land conservation (SLC) and integrated natural resources management (INRM).

This paper shares selected case studies of how the Botswana government (BoG), tertiary education institutions (TEIs), the private sector and non governmental organization (NGOs) have worked in partnerships in building capacity and availing new opportunities for women to spearhead changes in land and natural resources management since the 1995 United Nations Conference on Women in Beijing-China.

From Beijing 1995 to Beijing 2006: Policy Development and Legislation on women

A **national policy** on women and development (NWD) was approved by parliament in 1995. However, policy goals and objectives are not clear in regard to the issue of the environment but focus on the six critical areas of concern that were adopted by Botswana during the 1995 United Nations Conference on Women in Beijing-China. The policy priority areas are as follows:

- Women and poverty, including economic empowerment
- Women in power and decision making
- Women in education and training
- Women and health
- The girl child
- Violence Against women, including human rights

The **Women's Affairs Unit** was upgraded to the Women's Affairs Department (WAD). The department is faced with the challenge to include the environment and other related issues in the NWD. This would enable gender issues to be mainstreamed in policies, programmes and strategies of government and other development partners. The department works in partnership with different women non-governmental organisations (WNGOs), community based organisations (CBOs) and women groups (WGs). Some of these groups are involved in sustainable utilization and management of land and natural resources for

- Poverty alleviation
- Agrobiodiversity utilization and conservation,
- Income generation
- Empowerment
- Contribution to efforts of combating desertification and climate change
- Mobilization of financial and human resources of and with other partners such as Conservation International (CI)

- Facilitation and equitable distribution of government funds to women groups such as the basket weaving and Kgetsi ya Tsie groups as examples.

1. Partnership between WAD and women groups in private sector and NGOs: Case of Basket Weaving and Kgetsi ya Tsie (TyK) Women Groups

Basket Making: The Conservation International (CI)-Okavango works with women basketry groups in the Okavango area who use mokola palm (*Hyphaene petersiana*) for weaving baskets. These groups include, Bokamoso Co-operative, Shorobe women's group, Gumare, Shakawe and Gudigwa groups. These groups are spearheaded by women and have a membership of 30 weavers. Mokola palm (*Hyphaene petersiana*) plantations have been initiated to ensure a reliable source of raw materials without putting pressure on the existing palm stands.

Kgetsi ya Tsie (KyT) trust is another community project that uses natural resources for the economic empowerment of women in the Tswapong area through the use of natural resources. KyT was established to undertake the sustainable utilization and conservation of key natural resources within Tswapong area. The group uses *Morula (Sclerocarya birrea)* fruits to make sweets (candies), nuts for oil, body lotion and soap making. They also use *Monepenepe (Cassia abbreviate)* and *Gala la Tshwene (Myrothamnus flabellifolius)* for medicinal purposes and *Mosata (Orthanthera jasminiflora)* as vegetarian meat. During rainy season, melons (*citrullus lunatus*) are used for making jam. In order to conserve the resources, KyT members' plant trees in their homes for reforestation.

WERE WOMEN AT THE HEART OF THE PROJECTS?

The projects are owned, driven and implemented by women.

- The basket weaving groups are spearheaded by women and have a membership of 30 weavers.
- The KyT group is made of 1100 women in different villages in the Tswapong area. The organisation has received over P500, 000.00 (USD94, 340.00) from WAD in a period of five years.

2. Sustainable land management through conservation for utilization of natural resources: Cases of the devil's claw (*Harpogophytum procumbens*), *Hoodia gordonii* and other indigenous vegetation resources

a) Devil's Claw *Harpogophytum procumbens*)

The devil's claw (*Harpogophytum procumbens*) and *Hoodia gordonii* are two of the important medicinal plants of economic value in Botswana. The devil's claw is used in the treatment of arthritis, rheumatism, musculoskeletal pains, skin diseases, loss of appetite, protection against joint cartilage degradation, indigestion, high blood pressure, diabetes and etc .

More than 10,000 individuals, largely women and their families are involved in the harvesting of devil's claw in Botswana, Namibia and South Africa (range states). The majority of these are resource poor women. Available information from one district in Botswana indicated that out of 1500 harvesters, 1200 were women. Many of these live in desert prone and remote areas. Some depend largely on income generated from this natural resource.

The devils provide an income generating opportunity for the local communities. The first major commercial exports of devil's claw began in the 1960s, although export figures are available only since the resource began to be regulated. Since the early 1990s, the international market demand has steadily increased, with total exports from Namibia, Botswana, and South Africa reaching an average of over 600 metric tons of dried raw materials per year. On the German market the component of painkillers for the treatment of rheumatic/ muscular include devil's claw containing products such as Jucurba and Teufelskralle Ratiopharm for example.

b) *Hoodia gordonii* : desert plants with potential for development and commercialization

Although not much research has been done on *Hoodia*, reports indicate that the two species found in Botswana, (*Hoodia currrorii ssp lugardii* and *Hoodia gordonii*) have been used to control obesity, diabetes, abdominal cramps, haemorrhoids, TB and indigestion by the San tribes. Records indicated that the San used *Hoodia gordonii* to reduce hunger and thirst during hunting trips.

Hoodia species are succulents plants of the arid ecosystem belonging to the *Apocynaceae* family. There are twenty (20) known species. The plants are cactus like, but they are not cacti. Two are found in Botswana. These are *Hoodia currrorii ssp lugardii* found in the Central district (Bobirwa to the Makgadikgadi pans) and some patches in the Gantsi district. The most sought after is *Hoodia gordonii*, and is limited to the Bokspitz area of the country and in very small populations . The South African Council for Scientific and Industrial Research (CSIR) began testing the properties of *Hoodia* in 1996. They discovered that the plant contains previously unknown molecules that act on the brain (hypothalamus) and makes the body think that food requirements have been satisfied. The molecules or components are now known as P57.

The plant is believed to have an enormous commercial potential for controlling obesity, a problem that has been associated with high blood pressure, high blood cholesterol, and insulin resistance. Since 1980 obesity rate has tripled in most of the developed countries. While obesity reaches epidemic proportions, the afflicted become increasingly desperate to find new ways to control their body weight, thus creating a huge market. The importance of *Hoodia gordonii* as appetite suppressant effects has attracted the interest of many pharmaceutical and food companies worldwide. As of 09 May 2006, there were 7,400,000 websites on *Hoodia* related stories. This means Hoodia is a single plant that has taken the world by storm because of its usefulness as hunger control “magic pill.”

Challenges and opportunities in the sustainable management of the resources

a) The devil’s claw

- It has been observed that the price of the devils claw has fallen drastically, leading to less number of families involved in the collection of the plant.
- For 1 kg of dried devil’s claw, one has to harvest around 10 kg of plant material, with a potential for unsustainable exploitation of the plant
- Low local market prices of freshly harvested and dried devil’s claw: (€4.00 in 1996 to €1.60 / kg in 2006.
- Majority of woman active in harvesting the devil’s claw are elderly who believe are responsible for increased prosperity of the household while the youth and male members of the communities seem to be not interested may be due to low local market prices
- Currently, the international market is importing raw materials from the Botswana, Namibia and the Republic of South Africa and this poses competitions and exploitation of the harvesters
- The three countries have come together to protect the communities, the harvesters and the work modalities for conservation and management of the plant resources.

b) *Hoodia gordonii*

- World demand on *Hoodia gordonii* is very high,
- Hoodia has received CITES II listing in November 2004. This means that the collection of seeds, cultivation, movement and sale of plants are subject to permit control
- Technology of extracting the P57 is patented by CSIR and is currently the property of Unilver
- Botswana populations of the plant is very low, thus low amount of germplasm

- Cultivation of *Hoodia gordonii* is still limited due to various factors including capacity (knowledge and skills) and infrastructure in the country

Sustainable harvesting and benefit sharing

The government is engaged in feasibility studies to identify and assess options for

- a) Enhancing fair trade on both plant resources
- b) Expanding markets for the devil's claw harvesters in the region
- c) Cultivation of *Hoodia gordonii* by establishing three growing sites , building up four community based seedling production units and training communities in propagation methods, seed collection and storage methods

Expected impact of the projects on women in desert prone areas

The projects will

1. Identify and describe key elements, structures and instruments that enable fair trade in the resources in order to develop local marketing strategies
2. Assess different options for fair trade concerning implementation, timeframe, costs and risks.
3. Identify new markets and estimate future demand (local and export markets)
4. Identify options for getting access to potential markets

c) Utilization and conservation of other indigenous vegetation resources for sustainable land management

In order to rehabilitate the degraded range lands, Botswana has embarked on a pilot study to re introduce indigenous vegetation in some communities. These would be used for food, fuel, fodder, medicine, timber and environmental services such as carbon sequestration and contribute to the efforts of mitigating the effects of desertification and climate change. Examples are:-

- a) Participation in the management of indigenous vegetation for the rehabilitation of degraded rangelands in the arid zone of Africa. In Botswana, the project is operating in three pilot sites, which are Kgalagadi South, Kweneng North and Boteti. These are drought prone areas. A total of 477 individuals are participating in the project and 340 or 71.3% are women between the ages of 20 and 80. The Department and Forestry and Range Resources (DFRR) is implementing the project with the communities. Tree seedlings are distributed to the communities and the participating women groups are responsible for planting and tending them. The products are

distributed among the group members. Five hectares of woodlot have been planted.

- b) NGOs are highly involved in the rehabilitation of degraded lands, domestication, development and commercialization of indigenous plant species. The Veld Products Research and Development (VRP&D) has been spearheading this process since the early 80's. Some of the activities included the work on *Hoodia gordonii* domestication, cultivation for commercialization. The NGO also worked on community monitoring of the devil's claw (*Harpegophytum procumbens*, raisin bush (*Grewia flava*), the Kalahari myces pfeilii (truffles and thatching grass (*Eragrostis pallens*). The VRP&D believes that people would only be interested in the management of natural resources if they are able to derive a reasonable and sustainable income from them.

3. Agriculture Development Programs: A case of National Master Plan for Arable Agriculture and Dairy Development (NAMPAADD)

NAMPAADD is an integrated business model, based on multi-sectoral approach to sustainable land management. The program was developed in partnership between BoG and all stakeholders in an effort to drive the Botswana agricultural sector's contribution to Millennium Development Goal 7. The goal of NAMPAADD could therefore be described as: -

Transformed traditional agricultural system to commercial farming through the use of advanced technology, improved and sustainable land management for

- i. Dry land crop production
- ii. Irrigated crop production
- iii. Dairy production

Functions of NAMPAADD

1. **Capacity Building:** providing training and mentoring of traditional farmers to raise production to commercial level
2. **Facilitation of partnership** with private sector, NGO's and civil society (including financial institutions) in the providing agricultural goods and services.
3. **Establishment** of agro-industries and agro-processing infrastructure and enabling environment for agricultural production in high potential areas

NAMPAADD is the first large-scale innovative entrepreneurial agricultural program in Botswana. It was meant to be inclusive. For example, participating dairy farmers must have a source of roughage, so they must either raise fodder crops on the farm or subcontract crop production farmers to raise fodder crops for them. The minimum area for dry land crop production is 50 ha and

minimum herd of cattle for dairy production is 50 under highly intensified production system. There are no subsidies, no financial contribution from government except the inkind contribution as shown above.

Current Results (2005)

1. Sustainable utilization and proper management of the land that had been left fallow (grasslands) and threatening to turn desolate (desert).
2. Development and improvement of water harvesting technologies for commercial crop production and dairy
3. Reduction in grazing pressure on the rangeland through on farm fodder production for supplementary feeding of dairy cows. This would lower stocking rate in the rangeland thus reducing land degradation.
4. Mobilization of communities, groups and individual farmers to learn to cope with pressure of desert, desertification and climate change and have increase production levels due to improved management strategies and availability of markets.
5. Strong partnership among BoG, communities and private sector; (financial institutions, brokers) and other investors in agricultural development

WERE WOMEN AT THE HEART OF NAMPAADD PROGRAM? Government White Paper No. 1 of 2002 ON NAMPAADD article 53 stated: *Ministry of Agriculture should introduce incentives especially tailored to assist female headed households engaged in farming to enable them to commercialize their operations.* However, in the first three years of the program (pilot phase) only 11% of the participating farmers are women.

4. Research and Capacity Development: A case of Botswana College of Agriculture (BCA)

The Botswana College of Agriculture is an associate institution of the University of Botswana. It is the only institution of higher learning in Botswana that offers tertiary education in agriculture, natural resources management and rural development. It is therefore mandated to facilitate learning in land conservation and sustainable development as well generation of efficient and effective technology for increased on farm biodiversity for combating desertification and the effects of climate change. The formal programs and courses offered by the college are deliberately designed to prepare graduates to work in the semiarid ecosystems. Hands on activities demonstrate technologies geared towards mitigating effects and impacts of semi arid conditions.

The college has placed great emphasis on research that would eventually serve the interest of women. Majority of these research areas are on under utilized

animal and plant species, which are largely found in and suited for the Kgalagadi ecosystem.

New opportunities for combating desertification: Botswana Newer Crops Research and Development Initiative (BONCREDI)

The College has a long history of working on underutilized with great potential to grown in African, with special emphasis on bambara groundnut (*Vigna subterranea*) and *citrullus lunatus* (melons), *Moringa oleifera*, *Phaseolus acutifolius* (teparty beans), *Cajanus cajan* (pigeon peas), various indigenous vegetables and *Sorghum bicolor* (sweet sorghum) and veld products such a *Kalahari myces pfeilii* (truffles), *Tylosema esculentum* (morama beans). The research has been focusing on identifying the potential contribution of these plant resources to food security, improved nutrition income generation and biodiversity conservation.

In addition, the work on identification of high value, multipurpose potential crop plants suited for the Botswana precarious weather conditions has been launched. The main emphasis is on domestication, development and commercialization selected plant resources. The initiative is countrywide and known as Botswana Newer Crops Research and Development Initiative (BONCREDI). The objectives of this undertaking are to:-

1. Generate information, methods and technologies on domestication, development and commercialization on new crops for Botswana
2. Build capacity of researchers whose majority are women
3. Build confidence of women farmers who have been wild crafting or growing some of the crops and/or plant resources
4. Facilitate strong partnership at national, regional (Africa), Europe and Asia

Conclusions

1. Although the national policy on women and development has been in place since 1995, Botswana had not provided any guidelines on how to address the issues on women and the environment. The policy addresses issues concerning, women and poverty alleviation, economic empowerment, women in power and decision making, women in education and training, women and health, the girl child and violence against women.. However, the government, the private sector, and NGOs were not deterred by the absence of this component. All ministry departments were mandated to mainstream gender issues in their day to day operations. This then called for the upgrading of the Women's Affairs Unit to a fully fledged department (Women's Affairs Department (WAD)).

- The department is therefore reviewing policy of women in development and environmental issues shall be clearly addressed
2. Different projects of different scales and resources requirement on fighting the war against desertification have been put in place since 1995. These were supposed to cater for women but program such as NAMPPADD has not done so. In the first three years of the program only 11% of the participating farmers are women because
 - The recommended incentives for female headed households were never defined and/or developed
 - NAMPAADD capital requirement were beyond the reach of resource challenged women
 - The current results show that the cost machinery and other inputs were very high. Therefore **NAMPAADD** has not sufficiently catered for women
 3. Women have actively participated on sustainable utilization and conservation of key natural resources. These include
 - basket making and planting the raw materials (*Hyphaene petersiana*)
 - Product development such as *Morula* (*Sclerocarya birrea*) sweets, oil extraction, soaps and body lotions, as well as medicinal products from devils claws (*Harpogophytum procumbens*), *Monepenepe* (*Cassia abbreviate*) and *Gala la Tshwene* (*Myrothamnus flabellifolius*). These efforts were supported by the local NGOs.
 - Research and development of indigenous plant resources by both the government, tertiary education insitutions such as Botswana College of Agriculture and NGOs have yielded promising results and should be encouraged
 - There is potential for domestication and commercialization of high value plant resources in Botswana. These would provide food, fodder, income, medicine, timber, employment for women in the semi arid -arid zones of Botswana. These include *Hoodia gordonii*, devils claws (*Harpogophytum procumbens*, *Xemenia caffra* *Grewia spp*, and *Kalahari myces pfeilii* (truffles for example.
 4. Women in Botswana have greatly participated in small to medium scale land management and natural resources activities. These are less risky as women are more concerned with taking care of both the family and national economies. However institutionalization of the markets and market prices are still a challenge in the country.



In good years, May-July is the season for Kalahari myces pfeilii (truffles hunt. Women arriving from harvesting and one showing the largest find of the day. Kokotsha settlement in Kgalagadi sub district. (Pic by K.K. Mogotsi)

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