

**A CASE STUDY IN LAND DEGRADATION AND HUMAN  
VULNERABILITY IN THE DRYLANDS OF NORTHERN NAMIBIA**

BY

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## ACRONYMS AND ABBREVIATIONS

ACMAD	African Centre of Meteorological Applications for Development
AEO	Africa Environment Outlook
AGRHYMET	Regional Centre for Agrometeorology and Hydrology
CBOs	Community Based Organisations
CILSS	Inter-state Committee to Combat Drought in the Sahel
DRFN	Desert Research Foundation of Namibia
JES	Joint Expanded Secretariat for the WSSD
FAO	Food and Agriculture Organisation of the United Nations
IFAD	United Nations International Fund for Agricultural Development
IGAD	Intergovernmental Authority on Development
NAPCOD	National Action Programme for the Convention on Desertification
NGOs	Non-Governmental Organisations
RAP	Regional Action Programme
SADC	Southern African Development Community
SRAP	Sub-Regional Action Programme
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNSO	United Nations Sudano-Sahelian Office
WSSD	World Summit on Sustainable Development

## SUMMARY

Land degradation<sup>1</sup> in Africa is more severe than in other regions of the world largely because most African people are dependent directly on natural resources for their livelihoods. The degradation of land is caused by both natural factors such as drought, climatic variability, invasion by insect pests, and volcanic activity, as well as man induced causes, including soil erosion, salinisation, overgrazing, deforestation, and introduction of alien species. Some of the impacts of land degradation include reduction in agricultural productivity, reduction in water quality and quantity, impairment of navigation courses and increased flooding.

The objective of this case study is to assess how land degradation in former Ovamboland (Northern Namibia) has negatively impacted on the Uukwaluudhi community rendering it vulnerable to poverty, food insecurity and reduction in standards of human livelihood. The area is semi-arid and experiences variability in rainfall (300-500mm per annum) with high evaporation rates.

Over the past three decades, the key socio-economic challenges of the Uukwaluudhi community have included, among other things, intensification of deforestation and woodland degradation, overstocking, degradation of rangelands and arable lands as well as the adoption of private land ownership from communal ownership. These changes have, in turn, impacted negatively on the community resulting in a decline in agricultural production, scarcity of fuelwood, disintegration of common property management, reduction of availability of cow -dung in homesteads, increased food insecurity, and a decline in the quality of life.

In order to reduce human vulnerability to environmental change, the government has developed new land use policies that address the inequities in land ownership by creating and/or strengthening relevant government institutions. Community participation in forest management and land tenure reforms are also being promoted and the establishment of forest management authorities has been effected.

In implementing the United Nations Convention to Combat Desertification (UNCCD), the National Action Programme (NAPCOD) has established two sites in the northern region, which provide training in techniques on combating desertification<sup>2</sup> as well as the promotion of environmental awareness. The Desert Research Foundation of Namibia (DRFN), which facilitates NAPCOD in partnership with government ministries, is currently involved in identifying various approaches for the management of the renewable natural resources, promotion of community visits as well as dissemination of information. To support local and national efforts in combating desertification, the SADC sub-region has identified priority programme areas for implementation through the Sub Regional Action Programme, SADC-SRAP.

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<sup>1</sup> Land degradation is the reduction or loss of biological or economic productivity of land resources resulting from land uses or from processes such as water or wind erosion.

<sup>2</sup> Desertification is land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors, including climatic variations and human activities (UNCCD).

In order to demonstrate that land degradation control can be achieved, three examples of success stories involving community initiatives in other parts of Africa have been presented. The success stories demonstrate the essentiality of the democratic process as well as the need for full participation of the affected communities in decision making and ownership of the project. It is proposed that the Uukwaluudhi community should form a community or village level environmental action plan as well as an annual environmental work programme for the management of the community resources. For this to succeed the basic requirements would entail the formation of the community government, improvement of the community capacities and the involvement of women groups.

## **1. INTRODUCTION AND BACKGROUND**

Although land degradation is a global phenomenon in scale, its impact on communities and individuals in Africa is more striking than elsewhere because most of the African people depend solely on natural resources for survival. Land degradation results not only in a loss of primary productivity but also reduces the productive potential of these resources for the present and future generations. Because traditional African societies depend directly on subsistence farming to meet their daily needs, the degradation of land threatens both socio-economic and physical well being. The key causes of land degradation are both natural and human induced. Drought, climatic variability including strong winds (hurricanes, cyclones, etc), fires, changes in the water table, flooding, volcanic activity, and invasion by insects such as locusts are among the main natural causes of land degradation. These may be exacerbated by human-induced causes such as soil erosion, declining soil fertility, salinisation, soil compaction, overgrazing, deforestation, agrochemical pollution, unsustainable agro-pastoral practices, water-logging, the introduction of alien species, poverty and urbanization.

The impacts of soil degradation are many. They include reduction in water quantity and quality due to the sedimentation of rivers, lakes and dams; impairment of navigation of water courses; increased risk of flooding which, in turn, escalates the costs of flood control and dam maintenance; reduction in agricultural productivity which, in turn intensifies food insecurity as well as aggravating rural poverty and reduction in the capacity of soils to retain moisture, nutrients, soil structure and fauna and flora. Other economic sectors such as energy and water supply are also affected by soil erosion. In drylands of the region, moving sand dunes cause siltation of irrigation canals as well as smothering croplands, housing, rivers and highways. In those parts of the region where irrigation is practiced, poor irrigation techniques may result in salinisation, thereby rendering the soil unproductive.

Land tenure and access to land resources is a complex issue in Africa. In many countries of the region, a combination of unfavourable land tenure and ownership systems, the inequitable distribution of land and poor farming methods have led to the decline in productivity of grazing lands as well as reduction in crop yields. Poor land policies and land laws are some of the root causes of land degradation.

Nearly two-thirds of African land is arid or semi-arid. The African continent is the most seriously affected by desertification, which threatens more than one third of the region's land, particularly in the Sudano-Sahelian region, Southern Africa and the Mediterranean Africa. Drylands are particularly vulnerable to desertification because they recover very slowly. Although overgrazing has long been considered to be the primary cause of desertification in Africa, it is now thought rainfall variability and long-term droughts are more important determinants.

One of the most debilitating environmental factors in the region during the 1960s, 1970s and 1980s was drought. It caused the deaths of humans and livestock in alarming proportions as well as displacement of families and communities in many African

countries. The Sahelian drought of 1968-1973 affected some eight West African countries. The Sudano-Sahelian drought was followed ten years later (1982-1985) by the African drought which affected 34 countries in both drought prone areas as well as the traditional humid tropical climates. Several African intergovernmental organisations and institutions such as CILSS, IGAD, ACMAD and AGRHYMET were established in response to the severe droughts of the 1970s and 1980s.

The objective of this case study is to assess how land degradation in Uukwaluudhi (Northern Namibia) has negatively impacted on the community rendering it vulnerable to poverty, food insecurity, health crises and the reduction in standards of human livelihoods. The responses undertaken by the Namibian and other governments in the sub-region (and their institutions) to halt and reverse various aspects of land degradation are discussed. Selected examples on how other communities in the region have tamed the escalating land degradation are also provided. Finally, some suggestions are made towards improving management of natural resources at the village or community level.

## **2. THE UUKWALUUDHI COMMUNITY OF NORTHERN NAMIBIA<sup>3</sup>**

During the colonial era, land in Namibia was inequitably distributed along racial lines. The whites owned freehold title to 60 per cent of agricultural land, which they could sell, purchase or borrow money from lending institutions using it as collateral. According to Mbuende (1986), a Land Bank was established for the purpose of providing financial assistance to the prospective farmers. In contrast, the 40 per cent (about 33.4 million hectares) of land held by the blacks could not be sold or purchased freely because it belonged to the community (Moyo et al. 1993). The land held by the blacks (homelands and reserves) were located in areas with poor climates and soils as well as inadequate water resources.

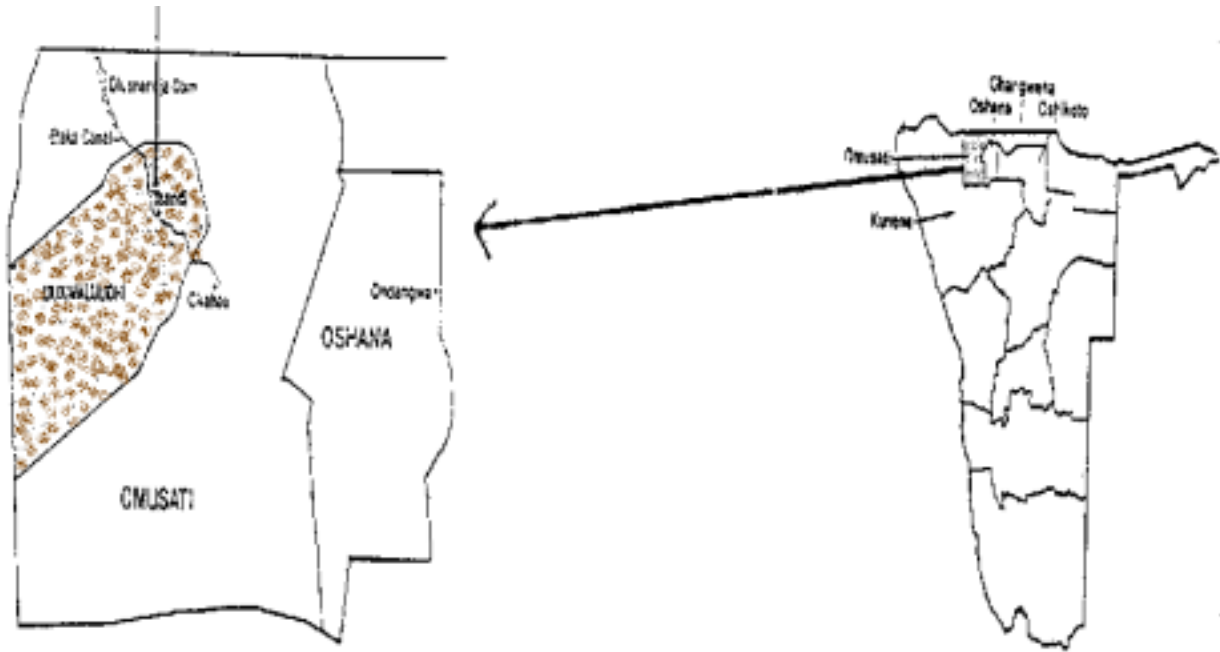
Uukwaluudhi is a former district within Omusati Region, one of four Regions into which the area of the former Ovamboland in northern Namibia was divided following independence in 1990 (Quan, et al. 1994). At independence, the Ovambo area was most populous in the country, containing over 600,000 people, approximately 44 per cent of the national population. The population of the Uukwaluudhi community was 34,448 in 1990 and the population growth rate was estimated to be 3.8-4.2 per cent. The population consisted of local people, returnees from Angola who had lived in Ovamboland previously but had moved to Angola during the struggle for independence, as well as people from other parts of the country (Quan, et al. 1994). The Uukwaluudhi people are not true pastoralists like the Maasai of Kenya. They are best described as semi-sedentarized farmers who raise some crops but move their livestock about in search of fodder and water.

The Ovambo region is semi-arid with variable rainfall, which decreases from about 500mm per annum in the east to about 300mm in the west. The Uukwaluudhi region,

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<sup>3</sup> The author has drawn freely from various papers contained in the Proceedings of Namibia's Workshop to Combat Desertification (1994).

which stretches from the Cuvelai flood plains to Kunene (see Fig.1) also, experiences great variability in rainfall as well as the east-west rainfall gradient. The rainy season extends from October to April with the highest amount falling between December and March. Because of the high average evaporation rates, it is estimated that a considerable amount of rainfall (80 per cent) evaporates shortly after precipitation.



**Fig.1. Map showing the Uukwaluudhi region in former Ovamboland.**

Source: Adapted from Quan et al, 1994.

In common with other former tribal homelands in Namibia, the environmental and socio-economic impacts of land degradation in Ovamboland are distinctly striking because most of the inhabitants depend on land resources for their survival. Owing to the high degree of dependence on natural resources for human needs, the majority of the Uukwaluudhi people have become highly vulnerable to environmental changes, particularly those related to the depletion of land resources. Like many other rural communities, the Uukwaluudhi people are insecure and vulnerable to environmental related diseases, food insecurity, economic losses and civil strife.

## 2.1. THE MESSAGE

Land degradation in the former Ovamboland region of Northern Namibia has been on the increase due to a variety of factors such as climatic variability, drought, soil erosion, overstocking/ overgrazing, deforestation and woodland degradation. The intensification of the above environmental changes has, in turn, impacted negatively on the livelihoods of the local Uukwaluudhi community, resulting in a decline in agricultural production,

scarcity of fuelwood, the disintegration of common property management, increased food insecurity, as well as a decline in the quality of life. In addition, the changes in the environment have deepened poverty as well as contributing to the migration of the local communities to marginal areas. Local and national initiatives have been put in place to halt and reverse the environmental changes. In order to accelerate land conservation in Ovamboland, local communities (especially women) must be empowered to participate fully in making and implementing decisions on the sustainable management of land resources.

### **3. PRESSURES: Key Socio- economic and Environmental Challenges**

#### **3.1 *A Decline in Agricultural Production***

During the colonial period, a marginalised subsistence economy was prevalent in the tribal territories, characterised by high unemployment rates and low peasant agricultural output. In Ovamboland, only 24 per cent of total land area was suitable for crop cultivation. They practised mixed farming involving crop and livestock production. The principal crop is still millet supplemented by sorghum, beans and melons. The ecological conditions of the area, notably low and variable rainfall, made it difficult to develop viable peasant agriculture. Most people owned only a few cattle, which, because of the apartheid policies, had never been grazed outside the Ovamboland boundaries. There were, however, well established patterns of animal exchange amongst households. Furthermore, the Ovamboland community lacked access to markets as well as essential agricultural services. Shortage of labour has been another constraint, arising from the migration of men to urban centres. The migrant workers, in turn, remit part of their income to support their dependants in Uukwaluudhi. However, because of the recent successive droughts in the area, drought relief measures and food aid have been introduced.

Available evidence suggests that rainfall was unreliable between 1970 and 1980, followed by consecutive poor rainfall years in the early 1990s, which culminated in the southern Africa-wide drought of 1992/1993. The Uukwaluudhi farmers have, therefore, experienced hardships since the late 1970s involving low crop yields and extensive deaths of their livestock. They have become vulnerable to food shortages as a result of rainfall unreliability during the last thirty years. They cannot survive on farming alone. They therefore substantially depend on income transfers derived from migrant labour remittances, local employment or small business activities. As a consequence of successive and severe droughts and low agricultural production, drought relief measures and food aid have been introduced to at least one third of the Uukwaluudhi families. Food deficits are made good through cash purchases of goods (sugar, cooking oil, dairy products) originating from commercial areas in the southern part of the country or South Africa.



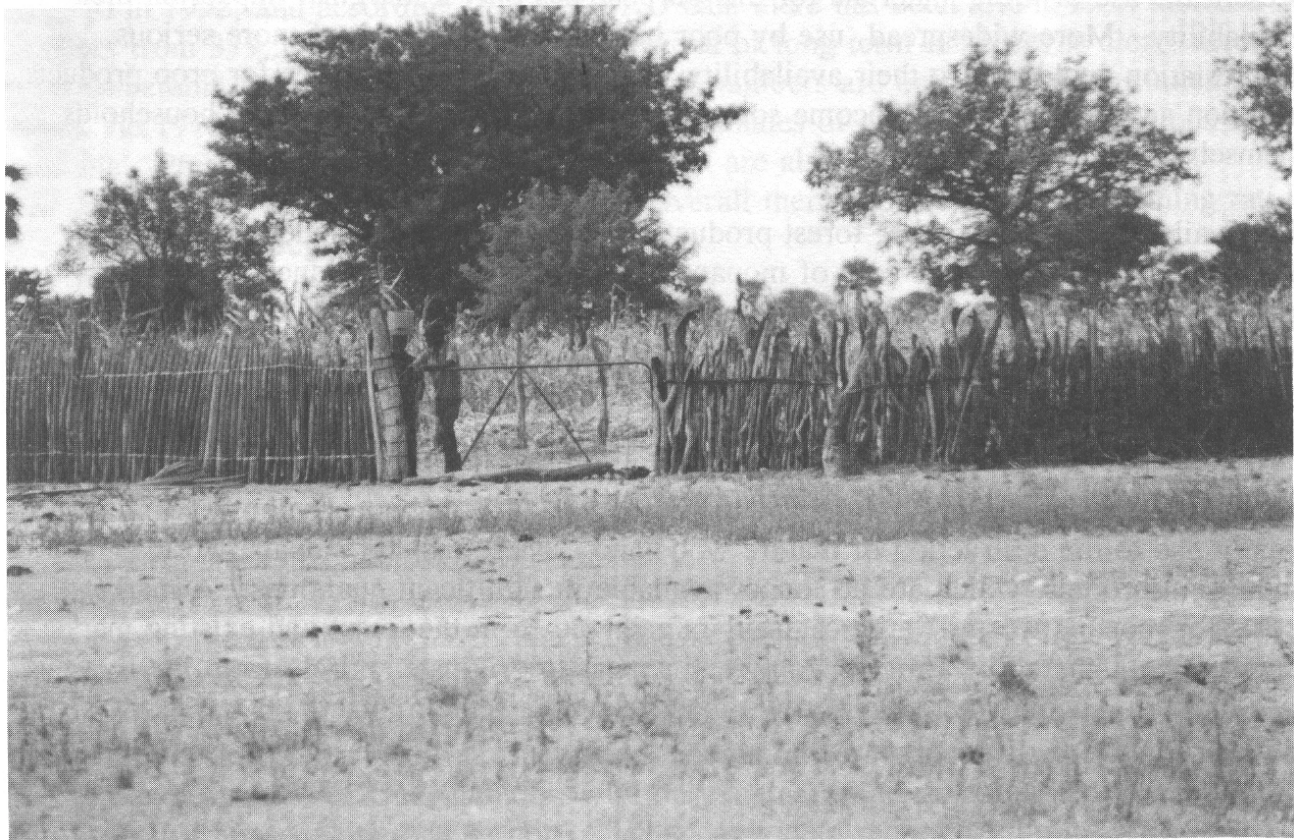
### 3.2 *Deforestation and Woodland Degradation*

Deforestation and woodland degradation have been taking place in central Ovambo region since the 1850s. Erkkila and Siiskonen (1992) reported that the area was divided into several kingdoms and that the communities were separated from one another by mopane and combretum, *Colophospermum mopane* and *Combretum mechowianum* forests. In 1886 the missionary- Hugo Hahn reported, for example, that a mopane forest of about 60-km wide separated the Ondonga and the Uukwanyama communities. Fifty years later the width of the forest had been reduced to 40 km and in 1950, a Finish missionary, Olle Eriksson, observed that the wooded area was still about 10 km wide. He further observed that in south Ovambo, millet stocks were being used as building materials. Today there is no forest between the two communities and the forests have been reduced to stumps and coppice (Moyo, et al.1993). Hans Schinz, a botanist, who visited the Ovambo region between 1885-86, warned that deforestation would be a serious problem in Ovambo in 50 years if population growth continued at the same pace (Shanyengana 1994).

Today the Ovambo communities have almost grown into each other and the mopane forests have been transformed into low shrubland due to repeated cutting or browsing. The eastern part of Ovamboland still has some forested areas although deforestation and woodland degradation is accelerating especially near rural market centres. Erkkila and Siiskonen (1993) reported that a family in Ovamboland uses about 21,600 poles for construction and fencing of the homestead. The average wooden fence of the homestead ranges from 2-3 m high and about 200-300m in length. Farmers traditionally use mopane timber and branches for fencing round their crop fields (Fig.2). A three hectares field would require some 800m of perimeter fencing at a cost of some N\$640<sup>4</sup>. When barbed wire and commercially available posts are substituted for mopane timber fencing, the cost for the 800-m perimeter fencing increases to N\$ 2168. The use of wire netting instead of barbed wire further escalates the cost. Because of the scarcity of mopane timber, the farmers generally use mopane branches, palm leaf stems, millet stalks and thorn scrub, which are replaced every three years (Quan 1994).

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<sup>4</sup> US \$ 1.0= 10 N\$



**Fig.2. Traditional form of perimeter fencing of crop fields. In view of the scarcity of mopane poles, only thin mopane branches and palm leaf stems have been used by this farmer.**

Source: Desert Research Foundation of Namibia

Furthermore, 80 per cent of houses in the region are built with indigenous timber. It is to be noted that Uukwaluudhi is also a source of fuelwood for other regions of the country. The mopane savanna type of vegetation is restricted to the northwestern part of the country, which does not experience frost during the coldest months (Moyo et al. 1993). Women and girls have to travel long distances ( a 30 km round trip) in search of fuelwood instead of working in the fields or engaging in income generating activities. Eight years ago, 90 percent of the Uukwaluudhi households depended on fuelwood for cooking purposes. The minimum monthly cost of fuelwood per family at that time was N\$ 60.00. The cost of fuelwood in the area has dramatically escalated so that many Uukwaluudhi rural households are finding it difficult to cope with new prices. Many rural families have, however, resorted to the use of animal dung, palm and marula nuts for cooking purposes, thereby depriving the exhausted soils of the needed organic manure. Bottled gas, although slightly cheaper than fuelwood, is not affordable due to the additional costs of the stove and the gas tank itself.

The change from nomadism to agropastoralism coupled with centuries of iron and copper smelting have also adversely impacted on forest resources. The iron and copper smelting,

which requires enormous amounts of wood, resulted in the production of agricultural tools such as traditional hoes and axes. The rapid rate of population growth in the region has exacerbated the rate of deforestation. Illegal fencing of communal land by the rich farmers has also reduced the area of available wood harvesting. The severity of drought coupled with frequent fires and the trampling and browsing of seedlings and new growths by livestock have markedly hampered natural forest regeneration. The militarization of the region since the late 1970s have further contributed to desertification due to intense de-vegetation and deforestation as the area was extensively used by the freedom fighters during the struggle for political independence.

### **3.3 *Land Rights and Resource Management***

In the 1930s and 1940s, the colonial administration began to sound warnings about the impending ecological disaster due to grazing, particularly in northeastern part of the country. In order to improve land use, the colonial administration urged the native reserve farmers to reduce livestock numbers to reasonable levels, and failure to heed the government decree would result in being compelled to do so. The colonial government decided to introduce fenced camps in order to facilitate “proper pasture rotation as a prerequisite for optimal utilization of available resources” in the reserves. Fencing schemes were introduced in Ovamboland in the 1980s.

In 1989, the then Minister of Agriculture and Nature Conservation stated that land degradation continued to be rampant in the communal areas for various reasons, including non availability of private land ownership resulting in lack of private initiative. The transitional National Development Plan (1993) also concluded that the, “lack of property rights in the communal areas makes it difficult to enforce soil conservation regulations.”

The private (individual) ownership of property rights was perceived to be superior to communal ownership. It was reasoned that investing land ownership and management in individuals would contribute to and enhance resource management because individual actions are informed by enlightened self-interest. Ogolla and Mugabe (1996) have argued that an individual invested with private property rights may not necessarily pay appropriate attention to the long-term sustainability of the land resources nor to the impacts of its use on the natural systems to which it is linked. Most modern exponents of the private ownership theory assert that a proprietor who knows every part of his territory, views it with affection and takes pleasure not only in cultivating but adorning it, is generally the most industrious, intelligent and the most successful. Hardin (1968) characterized resource use in communal grazing lands as the “tragedy of the commons.” He argued that since environmental costs arising from resource over-use are shared, rather than borne by a single herder, some herders will be tempted to increase their herds beyond carrying capacity of the commons, resulting in ecological collapse.

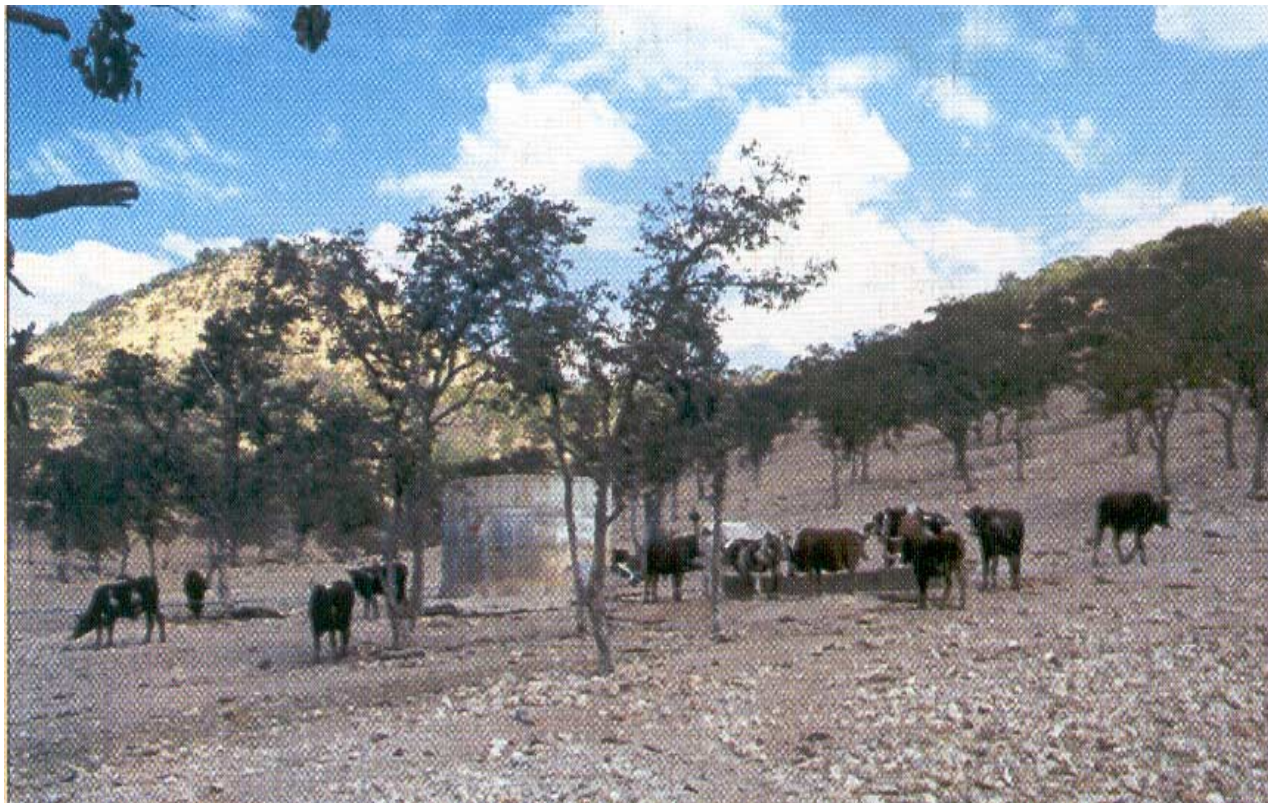
Hardin’s theory has largely been discredited on the basis that he confused situations of “open access” with “common property regimes.” In 1988, Hardin wrote to the *New Scientist*, and said that he should have titled the paper, “The tragedy of the *unmanaged*

commons” (Hardin 1988). In the pre-colonial era, common property regimes in Africa possessed in-built mechanisms for sustainable resource use and conservation. Guaranteed individual and family use rights were strictly adhered to and were meant to avoid over-use of the common resource.

### **3.4 *Overstocking and Rangeland Degradation***

Livestock farming continues to be the principal activity in many parts of Namibia. In the former communal lands such as Ovamboland, overstocking is normal because this is the farmer’s way of survival. The inhabitants reason that in the event of a drought, some livestock are likely to survive and hence their reluctance to de-stock. According to FAO/IFAD data (Moyo et al. 1993), the number of cattle in Ovambo region was about 380,000; it increased to about 486,000 (a 28 % increase) by 1992. However, in some instances the recommended stocking rate has been exceeded by 40 per cent. After a drought, farmers, particularly wealthy ones, tend to restock rapidly. Drought, therefore, constitutes a natural check on livestock population in the absence of enforceable legislation. Most peasant farmers have, however, switched from keeping cattle to goats and donkeys because of their ability to browse on a wide range of vegetation. Since the early 1980s, a number of factors have conspired to reduce cattle populations, including drought, diseases, poor development of water resources and rangeland degradation. The immediate cause of death has been attributed to poor quality pasture, which leads to poor nutrition and greater vulnerability to diseases.

Another important cause of rangeland degradation is the positioning and management of water points and boreholes (Fig. 3). Because of insufficient local grazing fields due to increased human settlements, herders are forced to trek long distances in search of green pasture. Transhumance is now widespread among the small and large herd owners. Since independence, boreholes have been established in grazing areas far away from human settlements resulting in the presence of large herds in these areas (cattle posts) for the greater part of the year. The concentration of large cattle populations in one area results in intense local overgrazing and rangeland degradation. Such degraded pastures become the major constraint to increased cattle numbers. The concentration of livestock in cattle posts has further reduced the availability of milk and animal manure to households. The shortage of dung adversely affects crop production.



**Fig.3 Cattle grazing near a water point.**

Source: Wolters 1994

Marketing facilities which would have encouraged de-stocking are lacking and hence the presence of high numbers of livestock. Policies aimed at rural development of communal lands are also lacking. Moreover, there has not been any investment in the development of alternative supplies of fuel, building materials, animal feed or alternative ventures to livestock keeping.

### **3.5 *Degradation of Arable Land***

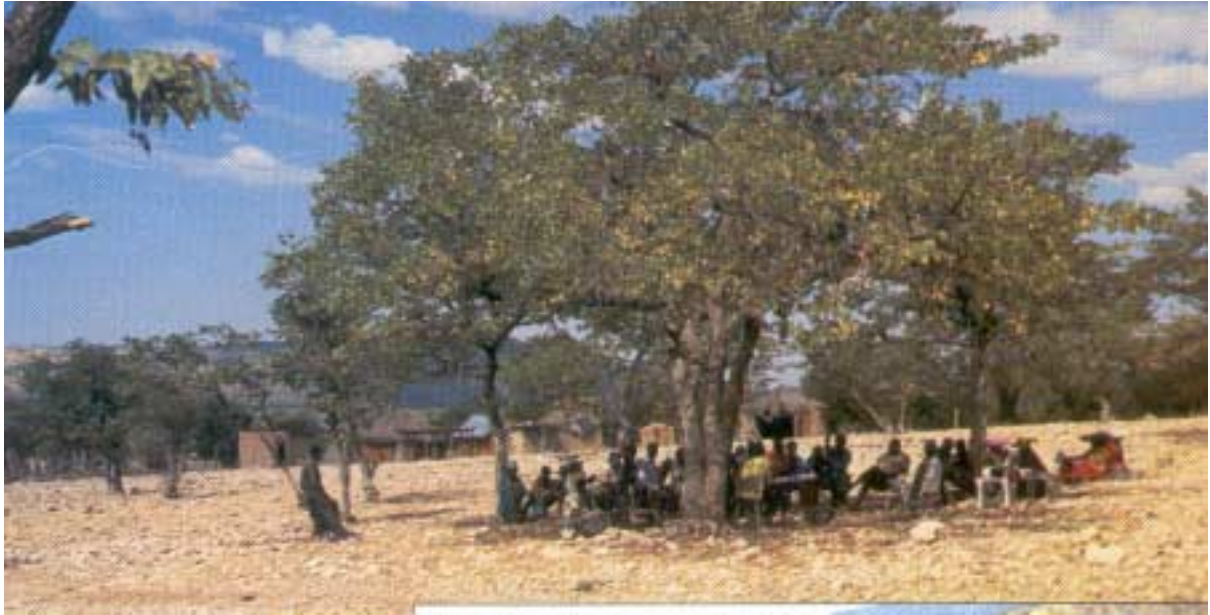
Food production (millet, sorghum, maize) in Uukwaluudhi has declined dramatically resulting in the importation of food requirements. Low rainfall, lack of labour, shortage of animal draught power and poor soil fertility have been suggested as the primary causes of reduced crop production. It has been suggested that by 1977, there were only 7 hectares per capita of productive land in northern zone and this figure was expected to have declined sharply by 1991 due to population pressure (Moyo, et al.1993). Lack of surface water due to high evaporation rates hinders biomass and crop production. A reduction in the number of cattle as well as their prolonged periods of absence at the cattle post results in the decline of animal manure essential for enhancing soil fertility.

### **3.6 *Legal Underpinnings of Land Resources***

The “native reserves” for indigenous Africans, which were created by law in 1898 by Governor Leutwien were subsequently consolidated and entrenched by South Africa after World War II (Moyo et al.1993). The best arable and grazing land in the southern plateau was transferred in 1919 to Europeans, who were given loans to farm and/or purchase them. The new farmers were further given breeding stock and technical assistance including the drilling of bore holes and the construction of dams.

The landless blacks were, however, confined in specially demarcated “native reserves” or homelands. The land tenure system, therefore, consisted of government areas, game reserves and deserts, black homelands and areas for whites. The homelands were subjected to rigid boundaries and in the case of Ovamboland, an artificial boundary was created (Werner, 1993).

Before Namibia was occupied by South Africa, the traditional chiefs or the village headmen played important roles in regulating access to land for settlement or grazing through collection of fees, etc. The chief/headman had overall responsibility for the management of the common land resources, including the regulation of grazing and the protection of trees and water points. Unfenced land was common property for the village community and its use was regulated by consensus under the guidance of the chief/headman. Every farmer/household in the community obtained and utilized land under specific rules. The chief’s forum was also used for discussion of community needs, problems as well as settlement of disputes (Fig. 4). This situation is described as a common property system and entailed equal distribution of use-rights to resource by a number of owners. Access to the common resource was institutionally regulated, i.e. subject to social control.



**Fig. 4. The chief's forum under a tree to discuss community needs, problems and the settlement of disputes.**

Source: Wolters 1994

### **The disintegration of common property management**

By the middle of the 1990s the chief or headman in Uukwaluudhi did not have the responsibility for the collective management of land resources. Members of the community resented receiving instructions/orders because it amounted to interference with individual freedoms especially after attaining political independence. The management of former common land and the resources therein (common woodlands, water points, certain trees, common corridors, etc) had virtually collapsed. The local inhabitants had no incentives to protect and conserve land resources for their own future use let alone future generations. Every one was encouraged to make full use of the available resources.

The above situation can best be described as open access to common lands and was characterized by the wealthy buying off traditional leaders in order to exert a controlling influence over the use of resources. This normally resulted in the increase of enclosures of grazing land built by large herd owners. The small herd owners faced enormous hardships with regard to diminishing watering points and grazing land, which deteriorated further due to overgrazing. There is, therefore, no legal basis for the protection, management and utilization of communal land resources in the Uukwaluudhi community (Quan et al. 1994).

In Uukwaluudhi, a widow or children do not automatically inherit land on the death of the husband. The children are expected to pay a new fee for the rights to land when the man dies. When the children marry, they too establish new settlements elsewhere. The

household, therefore, has no long- term security of land tenure and hence no incentive to, plant trees, conserve soils and water, or de-stock in order to reduce overgrazing. The resources are used unsustainably (Quan, et al. 1994).

### **3.7 *Land Rights in Some Other SADC Countries***

As pointed out above, the colonial administration and the newly independent African governments perceived traditional land tenure systems to be insecure and unsustainable for commercial and agricultural enterprises. The lands were, therefore, taken-over by governments and redistributed. This resulted in conflicts between contemporary and traditional tenure. The forceful eviction of the local communities from their lands resulted in the weakening of community-based natural resource management structures. In most SADC countries, commercial farmers occupy the best farm- land and contribute to the economy of the respective countries, while the poor occupy marginal, arid and semi-arid areas. In Zimbabwe, for example, about 4500 white farmers control over one third of the best arable land. The current land conflict in that country encompasses claims by veterans of the independence war as well as other ancestral claims (AEO 2002).

In South Africa, 70,000 white farmers owned 87 per cent of arable land, while the two million black subsistence farmers were restricted to 13 per cent of marginal lands (Moyo, 1998). In Botswana tribal land was converted to individuals lease-land for residential, farming and grazing purposes through the Tribal Land Act of 1968. This has led to the intensification of commercial cattle ranching resulting in further degradation of soils and vegetation. The traditional hunter-gatherer communities have been marginalized and relegated to the deserts. It is claimed that they are even being removed out of some of the deserts after diamonds are discovered under their lands; they are then moved to bleak communities far from their deserts (Hitchcock 2002) The traditional authority of the chiefs and headmen has been taken over by a Land Board Secretariat, a Technical committee and land officers.



## **4. IMPACTS**

### **4.1 *Deforestation***

There is now scarcity of fuelwood as a result of deforestation in Ovamboland. Shanyengana (1994) estimated that deforestation was occurring at the rate of 30,000 hectares of woodland per annum. The cost of fuelwood as well as timber for fencing and building has escalated. Some farmers have resorted to the use of dung and millet stalks for cooking. Crop production has diminished due to declining soil fertility, shortage of labour and animal traction. Sporadic rainfall and drought have also contributed to declining crop yields. Nutritional levels as well as quality of life have also declined. Female headed households with lower labour availability and fewer head of cattle have been most vulnerable in contrast to large herd owners.

As a result of spending six hours travelling 30 km to fetch fuelwood, women have less time to tend to crops, cooking and taking care of children. This has resulted in low crop yields and the attendant poverty and malnutrition.

As a consequence of degradation of forests and woodlands, a loss of species diversity has occurred in Namibia and other SADC countries. In the case of Ovamboland selective harvesting has resulted in localised disappearance of certain plant species. This in turn has resulted in changes in biodiversity including the relative abundance of different species as well as changes in microclimate. Deforestation has further resulted in accelerated soil erosion, which in turn has reduced crop productivity. Finally, the local communities whose livelihoods have in the past depended on bush meat, wild fruits and medicinal plants are likely to attest to forest and woodlands loss (AEO 2002).

### **4.2 *Overstocking***

It is difficult to define the carrying capacity of land in communal lands because pastoralists tend to manage livestock as mobile, flexible assets, which rely on mobility to utilize grazing and water resources over wide areas and long periods. Consequently pastoralists can afford to keep much larger herds than sedentarized farmers do within a particular location.

The more serious problem faced by the people of Ovamboland is the breakdown of the system of common property resource management due to the transformation of the role of traditional leaders and headmen by the colonial administration. Because of the inability of the chiefs and their headmen to manage and protect the scarce communal resources, the large herd owners have privatized or fenced off large pieces of communal lands. Consequently the small herd owners no longer have access to traditional seasonal watering points and grazing land.

### **4.3 *Health Impacts***

Although specific data on health impacts of land degradation are not available for Ovamboland in particular and Namibia in general, it is well known that a decline in crop production results in malnutrition. Recent UNDP data (1996/98) indicate that 31 per cent of the total population of Namibia is undernourished in contrast to 6, 14, 27 and 29 per cent for Mauritius, Swaziland, Botswana and Lesotho, respectively. Of course the per cent of the undernourished populations in Mozambique, Angola and Zambia is higher than that of Namibia (JES 2001). The country has, however, made tremendous strides in reducing infant mortality from 104/1000 in 1970 to 56/1000 in 1999 (JES 2001). It has been found that a number of diseases including malaria can afflict humans when vegetation cover is altered. Although malaria cases for Namibia (26,217 per 100,000 for 1998) are substantially higher than the average for SADC countries (15,939 per 100,000) there are probably other reasons for the high incidences other than the degradation of forests and woodlands. According to the UNDP Human Development data, Namibia has the third highest number of tuberculosis cases (480 per 100,000) in the SADC countries.

### **4.4 *Impact of Poverty***

Poverty is both a cause and consequence of environmental degradation. The two are inextricably linked. Poverty exacerbates environmental deterioration by forcing people to till marginal lands in a desperate struggle to survive. Although poverty has often been defined by income, a consensus is emerging that poverty encompasses a range of deprivations such as lack of access to natural resources, health care and education, inability to access the political process and vulnerability to catastrophes (JES 2001). According to UNDP, poverty includes not only a lack of material means, but also the denial of opportunities and choices most basic to human development. The depletion of natural resources and in particular land resources in Uukwaluudhi can be ascribed largely to poverty. It has further hampered the ability of the poor to recover from the environmental changes as well as weakening their social and ecological resilience.

## **5. RESPONSES**

### **5.1 *Development of New Land Policies***

In Namibia and other SADC countries, governments are developing new policies to address the inequities in land distribution with emphasis on catering for the previously disadvantaged groups. In order to implement effectively these new initiatives, governments have created and strengthened relevant government institutions, including the departments of land and local government, which are also charged with the responsibility of providing credit facilities as well as technical and professional services.

In Zimbabwe, the government plans to acquire 5 million of the total 11.3 million hectares of prime commercial land and redistribute it to the local population. Communal areas are also being re-organized on the basis of agricultural potential (AEO 2002).

In South Africa, individual or group based tenure use and access rights are being given to the local communities. Land Rights Boards have been established to arbitrate any disputes that may arise and make recommendations (DFID 1999). The Restitution of Land Rights Act was passed in 1994, and the Khomani San were given back 65,000 ha of land in 1999 (Chennels 2002).

Community participation in forest management and land tenure reforms is also being promoted and has gained momentum in some countries. In Namibia forest management authorities have been established. Ashley and La Franchi (1997) have reported that wild foods provide 50 per cent of a household's food requirements in rural villages in Namibia.

### **5.2 *Combating Desertification and the Mitigation of Drought***

#### **5.2.1 *Combating desertification at the local and national levels***

It may be recalled that the United Nations Convention to Combat Desertification and to mitigate the effects of drought was opened for signature in Paris in October 1994 and entered into force in 1996. An important aspect of the UNCCD is the empowerment of the local communities, particularly women, in the formulation of decisions towards desertification control. The UNCCD also stresses the special role of NGOs and CBOs and gives them an important role in ensuring the implementation of the convention (UNCCD 1996).

Namibia was the first African country to formulate a National Action Programme to combat desertification (NAPCOD). Namibia ratified the UNCCD on 16 May 1997. The objective of Namibia's Programme is "to combat the processes of desertification by promoting the sustainable and equitable use of natural resources suited to Namibia's variable environment for the benefit of all Namibia's citizens both present and future." The programme addresses the political, socio-economic as well as biophysical aspects related to land degradation. The main programme areas of the NAPCOD include:

- ◆ Identification of key players as well as establishment and improvement of their capacities;
- ◆ Establishment and strengthening of mechanisms for information collection, analysis and improvement;
- ◆ Development and/or introduction of integrated planning / strategies at all levels;
- ◆ Elaboration and implementation of an appropriate inter-disciplinary research programme;
- ◆ Provision of appropriate training and education at all levels;
- ◆ Empowerment of natural resource users and managers to plan and implement sustainable management practices in an integrated and decentralised manner; and
- ◆ Establishment of an organisation management structure.

A key goal of the Workshop held in July 1994 was to determine how NAPCOD would proceed at the local level and how local sites would be chosen and what information would be collected. In 1996 NAPCOD established sites in northern (Ovamboland) and western (Kunene) regions of the country. The Research Working Group has established a list of institutions, their current research foci and technical capabilities that are relevant to NAPCOD. The Directorate of Forestry, for example, specializes in agroforestry and forest ecology; mopane shrubland management and biodiversity; afforestation trials; and fire and vegetation dynamics- bush encroachment. Russo and Hanraham (1992) maintain that initial studies at the local level should focus on understanding indigenous knowledge regarding ecosystem functioning and integrating this with existing ecological theory. It is crucial to understand how local communities are managing risks associated with living in drylands, in order to effectively determine what needs to be changed and the change that will be most beneficial to the Namibian people (Jacobson 1997).<sup>5</sup>

To this end, two pilot project sites have been set up in the northern region at in Uvuudhija constituency and Oshakati town.<sup>6</sup> The Uvuudhija centre concentrates on establishing socio-economic baselines, training, and methods to combat deforestation. The Oshakati programme has established cooperation with NGOs and other organisations working in the area of environment in the northern regions to create environmental awareness. The programme addresses issues such as strengthening of the capacity of CBOs and community members to plan and sustainably manage their natural resource base and to promote diversified livelihoods. The programme further strengthens the capacity of relevant organisations to provide more effective and appropriate services to community based natural resource users, managers and organisations.

The Desert Research Foundation of Namibia (DRFN) facilitates NAPCOD in which it forms a partnership with the Ministries of Agriculture, Water and Rural Development (MAWRD) and Environment and Tourism (MET). In the North Central Region, including Ovamboland, the DRFN is currently supporting NAPCOD's efforts to provide environmental information to regional governments and in identifying and testing various approaches for the management of renewable natural resources. Within the context of the

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<sup>5</sup> [www.drfn.org/Napintro.html](http://www.drfn.org/Napintro.html)

<sup>6</sup> [www.drfn.org/Naphase3.html](http://www.drfn.org/Naphase3.html)

Regional Awareness Project (RAP), NAPCOD also provides assistance in the dissemination of information through hosting of workshops and discussions, distribution of booklets/brochures, radio programmes to decision makers in the region. RAP aims to develop and strengthen networks between traditional leaders, NGOs, CBOs, government ministries and key individuals; in order to mutually tackle environmental challenges. In order to intensify environmental awareness in communal areas in the northern region, RAP is collaborating closely with other stakeholders that deal with other aspects of desertification control, including livestock management and community development programmes.

The German Government through GTZ funds the RAP as well as the Project on Biomass Energy Conservation (ProBEC). The projects focus on promoting the use of fuel/biomass efficient and “clean” technologies with a view to reducing deforestation and other environmentally unsound practices as well as enhancing the quality of life in rural communities-e.g. by reducing health threats and other related social costs.

In April 2000, a Workshop was held in Gobabeb and was attended by experts from SADC countries-- to share information and data as well as lessons learned in combating desertification in their respective countries. The meeting took a decision to hold an International Conference in April 2002 in Gobabeb and Cape Town. In May 2001, members of the four communities involved in desertification control participated in the exchange visits to share ideas and experiences.

The International Conference entitled, “Alternative ways to combat desertification: connecting community action with common sense” was held partly in Gobabeb and in Cape Town, 4-20 April 2002<sup>7</sup>. The Cape Town segment focused on various topics such as alternative income generation, land tenure systems, indigenous knowledge, desertification process and rehabilitation and appropriate technology. The Gobabeb session focused on the synthesis of the proceedings as well as receiving the feedback on community visits. According to the Executive Secretary of the UNCCD, “--this was the first time that community members were prominent at a conference of this sort---“

NAPCOD is now in its third programme phase whose main focus is combating desertification through enhanced drought preparedness of Namibia’s farmers, both communal and commercial. Drought preparedness strategies include the development and application of appropriate land uses and farm management, agricultural product quality enhancement and diversification, investment in alternative livelihood development (supplementary to agriculture), development of economically and socially viable security and safety systems and improvement of markets and marketing strategies.

Because of the lack of readily available data and information on the location and extent of desertification in the country, the third phase of NAPCOD also focuses on the establishment of a national level desertification monitoring system. Using both ground survey data and the satellite imagery data, Klintonberg, et al. (2000) have reported on their preliminary findings for Uuvudhiya in the northern region. The data show that the

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<sup>7</sup> [www.drfn.org/des2002/newsletter2.pdf](http://www.drfn.org/des2002/newsletter2.pdf)

potential primary indicators of water availability, human population pressure and livestock pressure, climate variability (rainfall), soil properties and land management are closely linked to the state of the environment. Klintonberg and Gustad (2002) have further produced a desertification risk map of Namibia using the four indices: population pressure, livestock pressure, rainfall and soil erosion. The authors, however, recommend the need for development of additional indicators such as socio-economic parameters and health related factors for use in preparing desertification risk maps.

### **5.2.2 The SADC Sub-Regional Action Programme (SRAP)**

The priority programme areas of the SADC/SRAP include capacity building and institutional strengthening; information collection, management and exchange; strengthening of early warning systems; development and transfer of appropriate technology to the community level; development of alternative sources of energy; and cooperation in the management of shared natural resources and ecosystems (Imbamba 1996). The DRFN at Gobabeb has been selected and entrusted with the responsibility of coordinating the SRAP priority programme area of capacity building. The SADC/SRAP is linked to the NAPs through the multidisciplinary scientific and technical committee.

### **5.2.3 The Regional Action Programme (RAP)**

The implementation of the convention at the regional level is governed by the Regional Implementation Annex for Africa (UNCCD 1996). Priority programme areas have been identified at the regional level. Specialized institutions in the region have also been identified and entrusted with the responsibility of coordinating activities in their respective fields of competence. They work under the Regional Coordination Unit (RAP). Most African programmes of NAPs, SRAPs and RAP were presented to the third session of the Conference of the Parties in Recife, Brazil in November 1999.

## **6. LESSONS LEARNED IN THE CONTROL OF LAND DEGRADATION**

Although land degradation and desertification control has been taking place in Ovamboland for the past several years, the situation remains relatively unchanged. However, the control of land degradation and desertification can only be effectively tackled when the people most affected are fully involved and committed. The empowerment of the local communities (especially women) and their full participation in making and implementing decisions on the sustainable management and utilization of the natural resources will be crucial in achieving success in Ovamboland. Since 1995, UNEP has published successful desertification control activities implemented globally by governments, NGOs or communities. UNEP has further established criteria for evaluating the success stories. The three cases outlined below are among the ten award winning projects (1995-1999) in Africa on “Saving the Drylands.” It is to be hoped that those affected by land degradation will learn something from the success stories.

### **6.1 Improvement of Village Land Resource Management in the Central Plateau in Burkina Faso**

The Ministry of Agriculture launched the Project in 1988 in seven villages on 85 hectares of land; it was expected to last for a period of ten years. Four years later, the project was extended to 197 villages on 1607 hectares. The project only commences when the village takes an initiative and requests for support, thus demonstrating the willingness to conduct a self-help activity.

The Central Plateau of Burkina Faso lies in the Sahelian zone and used to be covered by forests until the 1960s, when uncontrolled logging and bush fires decimated the forests. Plains below the hills are used for growing millet and peanuts and are severely affected by soil erosion. The annual precipitation (about 500 mm) falls within a period of only four months. On an average, about 200 tonnes of soil are lost per hectare per year. The average population density is more than 40 inhabitants per km<sup>2</sup> compared to the national average of 32/km<sup>2</sup>.

Some of the key issues associated with resource destruction in the Central Plateau include loss of soil fertility, declining crop yields, scarcity of fuelwood, water shortages, food and animal fodder. A number of measures are being taken to improve resource management such as elaboration of the national plan of action to combat desertification, prohibition of bush fires, supervision of wood trading, promotion of efficient stoves and promotion of information campaigns directed at rural residents.

The soil erosion control measures include its stabilization in order to permit water to percolate into the ground. The soil conservation measures consist of construction of stone bunds and the plugging of gullies. These mechanical structures are supplemented by biological measures—planting of trees, shrubs and grass as well as the application of organic fertilizer. By 1992, the total length of the erosion-control structures erected was 960 km while that of the plugged gullies had reached 406 km.

The work is carried out jointly since it would be too difficult and labour intensive for individuals on their own. Stone bunds are made by hand; the stones are either stacked or piled loosely. Many women take an active part in all phases of the work especially in building the erosion control structures. Due to the success of the project, farmers have regained a positive outlook on life and are thus encouraged to stay rather than migrating to other regions. As a result of the erosion control measures, there has been an increase in crop yields. Soil water retention has substantially improved due to soil and water conservation measures.

Other activities of the project relate to land- use planning in which technical personnel, village extension workers and village communities participate. The village's perimeters are sketched so that they know that they have only a limited space with limited resources at their disposal. Aerial photographs are also taken and by 1992, some 220 farmers had been trained in how to "read" and interpret aerial photographs. NGOs participate fully in this project. Their tasks involve, among other things, mediation between village population groups and government structures, provision of additional assistance to the villagers and strengthening of the participatory process of the villagers in the self-help project. The people of Central Plateau of Burkina Faso were in the 1970s and 1980s vulnerable to an array of environmental changes involving deforestation, soil erosion, harsh climatic conditions and scarcity of fuelwood. The changes further intensified food insecurity. This project was launched in order to halt and reverse environmental degradation and thus reduce their vulnerability to environmental changes.

## **6.2 The Wei Wei Integrated Development Project, Kenya.**

The Project is located about 500 km North West of Nairobi, Kenya and involves land reclamation and improvement of some 700 hectares in the Wei Wei River valley of West Pokot District. The project commenced in 1987 through cooperation between the Kenya Government and the Italian Development Cooperation. The project location lies at an elevation of 950 m above sea level at the foot of the Cherengani hills. Although the mean annual rainfall is 979mm, evaporation is very high (2289mm per year).

The main environmental problems of the region include recurrent droughts leading to rain-fed crop failure. This leads to regular food deficits for the local communities, which in turn, leads to periodic cycles of high vulnerability to food shortages. The other problems relate to shifting cultivation and pastoralism resulting in overgrazing. Prior to the commencement of the project, there were no developments of any kind and the inhabitants were encroaching the hill slopes for agricultural development.

Some of the planned activities of the project included the construction of the intake weir on the Wei Wei river, laying of underground steel and PVC pipeline network for the distribution of water through a gravity fed sprinkler irrigation system, land reclamation and improvement, setting up of a pilot farm (50 hectares) for the provision of support



logistics, equipment and other inputs and the development and allocation of individual plots.

The benefits and impacts of the project have included the reclamation of 300 hectares of badly degraded land and by 1999 over 225 plots had been allocated to local farmers. Water, which was a scarce commodity, is now available in abundance 24 hours a day. The slopes of the Cherengani hills, which had been encroached upon by the Pokot farmers have now been relieved of pressure and are reaching their previous levels of biodiversity. Environmental improvement of the area through agroforestry practices has occurred. The planting of fruit and forest trees in homesteads that once stood on heavily degraded land has markedly rehabilitated the environment. Vertiver grass has been planted on water channels to curb erosion. The project has also introduced legumes for crop rotation with cereals as well as planting wind breaks along the plot perimeters using species such as Lucaena.

The project has created a number of jobs and, thus, increased income-earning opportunities for the local communities. The number of children enrolled in schools has expanded from 35 per cent before the project to over 70 per cent. Crop yields have increased from 0.5t/ha to 3.5/ha for maize and even higher yields for sorghum and has, thus, improved food self- sufficiency and security. Household diets, nutrition and health have improved as a result of fruit availability. The farmers have created the Wei Wei Farmers Association, which is being run with the advisory support of a government department. Deforestation, overgrazing, poor irrigation techniques and related environmental perturbations had constrained the coping capacities of the people of West Pokot. In order to reduce their vulnerability to environmental changes the government in cooperation with the Italian Development Corporation launched the Wei Wei Integrated Development Project, which has resulted in dramatic environmental changes as well as improving food self-sufficiency and the health status of the community.

### **6.3 Sand Encroachment Control and Agropastoral Development in Mauritania**

The migration of sand dunes due to intense winds constitutes a serious and hazardous problem in Mauritania because sand encroachment threatens both productive land and infrastructure. The country also experiences erratic and unpredictable rainfall with recurrent and severe droughts. The vegetation cover is sparse due to drought and over-grazing, which further contribute to the migration of sand. The rapid population increase continues to exert pressure on land, which has led to migration of the rural poor to the urban centres.

A project to halt sand-dune encroachment through fixing the existing dunes was set up in eight regions of central Mauritania and implemented by UNDP/UNSO and the local communities with funds from the World Bank. Physical and biological barriers were also established to control moving sands. Local communities were empowered to initiate and manage sand dune stabilization projects on their own as well as using the land for agrosylvo- pastoral activities.

Some of the major achievements of the project include the establishment of windbreaks and village re-forestation on 328 hectares; protection of agricultural and grazing lands, oases and infrastructure against sand encroachment; regeneration of pasture and trees in protected areas resulting in movement of people back to previously abandoned land and villages; increased and better nutrition through vegetable production; and improved status of women through involvement in project activities and the formation of economic production units. A key output of the project is the mastery of sand dune fixation and rehabilitation techniques by the local populations and their ability and quest to initiate the same in neighbouring locations.

## **7. PROPOSALS FOR FUTURE ACTION**

The success stories in combating land degradation and desertification clearly demonstrate the essentiality of meaningful democratic participation by the local people. The need for adequate preparation—focusing on livelihood concerns and reliance on the locally available tools, materials and skills are also paramount. In order to participate fully in the implementation of NAPCOD, the Uukwaluudhi community may wish to form a Village Level Environmental Action Plan (VLEAP) as well as an Annual Environmental Work Programme (AEWP) for the purpose of translating the principal elements of the plan into concrete activities. The VLEAP and AEWP must also reflect the short-, medium- and the long-term objectives of the community as well as the resource constraints and the limitations of their own human, institutional and infrastructural capacities. The design and implementation of the VLEAP and the AEWP will be guided by procedures geared towards: sensitizing the community; determining the magnitude and dimension of the socio-economic and environmental problems; providing support to the creation of village committees; supporting the actual elaboration of the VLEAP and AEWP; establishment of working relationships between and among the government, the community, NGOs; and the establishment of monitoring and evaluation mechanisms.

## **8. CONCLUSION**

Land degradation and desertification in the African region has been on the increase since the early 1970s and the problem is likely to intensify in the next three decades due to an increase in climate variability and population pressures. In the Ovamboland, changes in land use, including deforestation and woodland degradation, soil degradation, loss of habitats and biodiversity, and rangeland degradation have impacted negatively on the livelihoods of local communities. Such changes in the environment have further deepened poverty and increased food insecurity as well as contributing to the migration of local farmers to marginal areas where they are likely to cause additional and irreversible damage. The rural communities of Ovamboland have also suffered from water stress and fuelwood scarcity. The women folk spend long hours searching for fuelwood and fetching water instead of tending to farming activities and looking after the children.

The main social factors which have markedly contributed to human vulnerability to environmental change include poverty, population pressures, health crises (malaria and tuberculosis) and armed struggle against the colonialists. Local, national and sub-regional actions are underway to halt and reverse the environmental changes.

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