

Communities take the lead Monitoring and management of natural resources in communal farming areas

A case study from Namibia

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A. INTRODUCTION

Project history

Namibia's National Programme to Combat Desertification (Napcod) was launched in 1994 (Wolters 1994). This event followed a long developmental history. A crucial element leading to the possibility of forming Napcod was the independence of Namibia realised only in 1990. Prior to independence, the imposed system of separate development created the template for land degradation in both commercial and communal farming areas. Northern communal areas, supporting over 60% of the population, have the highest rainfall but limited development as people depend primarily on subsistence agriculture based on millet and livestock. Western and southern communal areas have low rainfall preventing cultivation of rain-fed crops, comparatively low population and limited development. Central commercial farming areas with medium to low rainfall occupy 43% of farmlands while supporting approximately 5000 individual livestock farms.

The United Nations Conference on Environment and Development took place two year's after Namibia's independence which provided just enough time for the preparation of Namibia's Green Plan (Brown 1992) which was presented in Rio de Janeiro. The chapter on desertification, highlighting the relationship of sustainable livelihoods and the environment, set the scene for development of Napcod. As Namibian representatives participated in the negotiations and then the conferences of parties, there was a continuous interaction between the United Nations Convention to Combat Desertification and the evolution of Napcod.

The planning of Napcod during 1994 highlighted wide participation and awareness raising. Thirteen rural communities throughout Namibia's vast expanse, representing varying biophysical areas and socio-economic systems,

were fully incorporated into the programme. Starting off using participatory appraisal methods they informed the process of their experiences of loss of productivity and then brought this experience to the mid-year National Workshop (Wolters 1994). A drama group helped them describe the workshop process and results to their surrounding communities. At the same time, a slightly different strategy was evolved to include government, non-government and civil society from the urban areas. The result of this planning process was a dynamic programme, rather than a static plan, that is now in its third phase. Throughout the process, support has been provided by the German Government through the GTZ.

A key element of Napcod was the strategic partnerships that were formed early in the process. The Ministry of Environment and Tourism (MET) took the lead with strong interaction and support from the Ministry of Agriculture, Water and Rural Development (MAWRD). An NGO, the Desert Research Foundation of Namibia (DRFN), implemented a majority of the community and some of the national level components. In Phase III of Napcod, the DRFN has joined with the Namibian Economic Policy Research Unit to implement key objectives.

From the beginning, Napcod was guided by a Steering Committee with wide representation from government and civil society. Early in the process the Steering Committee took the principle decision that Napcod would assume an 'umbrella' function welcoming interaction with or providing support to a variety of other projects and programmes. This approach has had great influence on Napcod's implementation, from its wide representation and many cooperating partners to a lack of clear definition of who and what is the 'essential' Napcod.

Namibian environmental overview

Namibia is the most arid country south of the Sahel (Brown 1992). The country covers an area of slightly more than 800,000km² where 70% of the population of 1.6 million is involved in subsistence agriculture. Over 60% of Namibians live in the northern regions where rain-fed agriculture is possible but which comprise only 18% of Namibia's land surface. In contrast, just 7% live south of the capital Windhoek on 32% of the land that receives less than 250 mm mean rainfall. Over eleven distinct languages or language groups exist in the country.

Aridity decreases from the west coast with less than 20 mm rainfall to the north-east where in the semi-arid climate over 500 mm of rain occurs per annum (Dealie *et al.* 1993). This spatial variation in climate means that livelihoods of people vary greatly throughout Namibia's landscape. The climate of Namibia also experiences great temporal variability with annual rainfall totals ranging from less than one quarter of the long term mean to more than twice this value (Dealie *et al.* 1993). Low rainfall in Namibia is accompanied by high potential evaporation such that overall it is more than five times the annual rainfall (Heyns

et al. 1998). It is estimated that of the total rainfall in an area, 83% evaporates almost immediately, 3% is available for runoff and groundwater recharge while the remaining 14% is taken up by the soil and used for plant growth returning to the atmosphere by evapotranspiration. These basic characteristics of the Namibian environment have wide ranging implications for land use and management.

The availability of land and its renewable natural resources varies with the variability of rainfall and landscape as does the different types of natural resource use and management that can take place. The current pattern of land use and natural resource management only partially reflects the prevailing aridity and climatic variability. It is also reflects past and present political, economic and social influences (e.g. SDP8, SDP7, SDP2). Existing land degradation and loss of productivity mirror the integrated effects of landscape types, land use and land management patterns (Kakujaha 1999). The manifestations of land degradation include deforestation (in the northern areas), deterioration of rangelands (throughout), widespread soil erosion, bush encroachment (in the central areas) and localised soil salinisation.

Overview of legislative framework

A number of documents formulated in the eleven years since independence of Namibia directly or indirectly support integrated land and water management and sustainable development. These include, *inter alia*, the Swapo Manifesto, the draft Land Act, the Commercial Land Act, the Water Policy and draft Water Act, the Agricultural Policy and the Community Based Natural Resource Management policy and regulations. Only some of this policy and legislative framework takes into consideration the aridity and variable climate of Namibia, often assuming instead that the productivity of the land is a constant. An example is the high priority placed on irrigated agriculture for job creation and growth, wherein the natural variability of Namibia's arid climate can be at least partially circumvented (Swapo's plan of action, 1999). Three objectives of the Swapo policy include: to bring small-holder farmers into the mainstream of the Namibian economy; to redress past imbalances in the distribution of land as a resource; and to create employment through full-time farming. In view of the need for flexibility and quick response time to Namibia's arid and variable climate, at least two of these three objectives run contrary to current developments taking place in the country. While it is extremely important to redress past imbalances in distribution of land as a resource, it must be remembered that the condition of a variety of renewable and non-renewable natural resources is what gives land its value for people and land itself is not a resource.

The Agricultural (Commercial) Land Reform Act (Act 6 of 1995) considers the varying rainfall and quality of farmlands throughout Namibia. Indeed, the pattern of acquisition of commercial farmland by the government in Namibia tends to

confirm this recognition. The act itself, appropriately, does not take the next step of addressing farm management emphasising aridity and climate variability nor does it prevent absentee farm management, a common response to constraints in Namibia contributing to land degradation.

Environmentally sustainable land use is incorporated into the National Land Policy (1998) in both urban and rural contexts. However, some of the sections, e.g. that on land enclosure, ignore environmental considerations and focus on spatial planning and consultation with users. This document highlights the attention paid to sustainable development in policy development, however, to date these concerns are not backed up by regulations, training, capacity building or all the other aspects of integrated land and water management essential for sustainable development.

Similarly, the draft National Resettlement Policy (2000) addresses resettlement that is 'institutionally, socially, economically and environmentally sustainable and which will enable settlers to become self supporting'. In some instances inappropriate land use has been promoted during its application. For resettlement and redistribution to be successful, political and social goals must be amalgamated with environmental realities of our arid and variable climate.

The National Agricultural Policy (1995) goes a long way toward supporting sustainable development in Namibia. Should the various components of this policy be implemented, agricultural development would be enhanced. Similarly, the National Drought Policy and Strategy (199*) specifically addresses the arid and variable climate of Namibia. It points out that dry times are natural occurrences for which planning and preparation are essential. This includes the flexibility, adaptability and rapid response essential for good land management. 'Disaster droughts', for which planning, preparation and ongoing integrated management are insufficient and which require external intervention, is an infrequent occurrence in Namibia.

The draft Water Bill (2000) provides many tools in support of sustainable development of Namibia. It reinforces the Constitution of Namibia wherein it states that all water belongs to the state. Riparian rights (exclusive rights for people living along a watercourse) and the allocation of water rights with land rights are both excluded in the draft Bill. These elements could have implications for integrated land and water management if inappropriately applied. Decentralisation (cf. Decentralisation Enabling Bill) is also promoted by the draft Water Bill and the concept of Basin Management Committees as primary planning and integrated management units is being explored.

In summary, concepts of environmentally sustainable development, explicitly or implicitly including land and water management, are found in many components of Namibia's legislative framework. Nevertheless, application of this framework to current practices will not be sufficient to ensure the desired outcome.

Appropriate concepts and approaches are available but capacity, interest and willingness to change are limited. As long as long-term sustainable development, including by definition economic, social and environmental aspects, is seen in opposition to the immediate needs and development of the formally disadvantaged population, the current legislative framework will not address the outcomes all Namibians seek.

The Project: Napcod Phase I and II

Napcod is a partnership programme between the government, public private service organisations (SOs), the non-governmental organisation sector (NGO), as well as the community-based organisations (CBOs) and individuals. The implementing government ministries are the Ministry of Environment and Tourism (MET) and the Ministry of Agriculture, Water and Rural Development (MAWRD) (Napcod 1997).

The overall goal of Napcod 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 Namibians both present and future.' The participatory workshop of Phase I generated a draft policy and framework for a national programme through identification of eight key objectives with different entry points for programme interventions. This goal and the associated objectives were derived by all participants at the 1994 national workshop, thus the entry points for interventions and their appropriateness were identified by the 225 workshop participants ranging from local to national level.

Objective 1 of Napcod II was 'key players are identified and their capacity is established/ improved.' By involving a wide range of key players, Napcod enjoys the support of ministries and ngos in sensitising their own staff as well as in integrating desertification concerns into ongoing national, regional and local programmes and activities. Particularly important in Namibia's vast, sparsely populated rural areas are the ties, still being strengthened, with elected regional councils and their administrative staff as well as with regional staff of central ministries. Traditional leaders participated in the 1994 workshop and remain committed partners.

The media represents another key player in Napcod and have contributed to increased awareness of Namibia's arid and variable climate. Calls for emergency drought relief are neither so frequent nor so strident as previously. This, in turn, supports the government and ngos in their efforts at integrated land and water management limiting emergency relief measures that usually negate long term goals.

The Southern African Development Community – Environment and Land Management Sector is a key contact in Napcod. They have designated the

Gobabeb Training and Research Centre in Namibia as the SADC-ELMS focal point for training, research and networking in support of the CCD.

Objective 2 of Napcod II was 'mechanisms for information collection, analysis and communication are established, strengthened and functioning.' Facilitation of information flow among rural natural resource users and national decision makers has been a major focus of Napcod. In support of Napcod, the DRFN frequently dedicates issues of its 'Environmental Update' to desertification matters. Updates are circulated to parliamentarians on a twice monthly basis while they are in session. International communication, through publications and through participation in workshops and conferences, is wide spread.

Objective 3 of Napcod II was 'integrated planning strategies and approaches at all levels developed and introduced on the basis of clearly defined policies.' This objective served to inform all activities of Napcod, from national to local level and included cooperative planning amongst participating ministries, ngos and cbos throughout the programme. One highlight was the evolution of the Forum for Integrated Resource Management, known as Firm. Initiated on a pilot basis, four funded projects attempted to synergise their inputs and support to and interactions with one already well developed, organised and active CBO, the Grootberg Farmers Association. These projects included: Napcod, the Sustainable Animal and Range Development Programme (Sardep), the Communal Area Water Supply (Caws) project and the wildlife-oriented community-based natural resource management programme known as the Living in a Finite Environment (Life) programme. Firm addressed improved goat production, integrating wildlife and tourism into the livelihoods of the community, improved management of water supply and broadly enhanced information exchange and networking. The success of this integrated planning and approach is substantiated by the replacement of one project by a government department as participants, demand from the CBO for further support from government and private Service Organisations – strongly promoted by the projects, and requests for this type of intervention to be repeated elsewhere in Namibia.

Objective 4 of Napcod II was 'appropriate inter-disciplinary research programme elaborated and implemented.' Although identified by the 1994 national workshop as an objective, limited funds were allocated to this objective. This was partially based on the funders' view of basic research and its lack of application. Nevertheless, throughout Napcod II a research approach was undertaken ensuring that critical assessments of bio-physical and socio-economic components of the environment were undertaken and that the programme itself was monitored, evaluated and adjusted continually. Research carried out by local and international researchers was encouraged and coordinated and integrated into Napcod wherever possible. Economic research undertaken during Phase I indicated that economic losses from desertification amounted to US\$40 million per annum, a statistic that boosted the interest of

decision makers on all levels. Throughout Napcod II, participatory research with local communities focused on monitoring rainfall and the state of grazing. This latter research activity forms a major component of Phase III.

Objective 5 of Napcod II was 'appropriate training and education provided according to needs at all levels.' Although always a guiding principle to Napcod, this objective was not directly funded by the programme. Various associated programmes were undertaken. These included the cross-curricular Eniroteach project (implemented by DRFN on behalf of the Ministry of Basic Education and Culture funded by Sida), the Summer Desertification Project (implemented by DRFN with 15 University and Polytechnic students and funding from Sida), writing and publishing eight regional books addressing Water and Grazing Management for use by government extension staff (implemented by DRFN on behalf of the Directorate of Rural Water Supply funded by Sida). In addition, Napcod facilitated a variety of training activities for farmers in Napcod pilot areas.

Objective 6 of Napcod II was 'natural resource users and managers empowered to plan and implement sustainable management practices in an integrated and decentralised manner.' This objective was at the heart of Napcod II and all other objectives contributed to this one in various ways.

Northern Namibia: Over 50% of Namibia's population live in four densely populated regions of Ohangwena, Omusati, Oshana and Oshikoto. Urbanisation and rural development are concentrated on the central part of the Cuvelai basin with its ephemeral wetlands known as oshanas (Marsh and Seely**). Pearl millet is the major rain-fed crop and livestock forms an important part of the agricultural system. As much of the underlying groundwater is saline, people in this area rely on water transported by open canals and pipes from the shared (with Angola) Kunene River. Although people living in the three pilot sites have sufficient natural resources to support their current life styles, the rapidly growing population (>3% per annum) is accelerating loss of productivity. Deforestation and use of wood, particularly for construction and fencing but also for fuel, and management of livestock are the key questions.

Both of these issues have their basis in tradition and social structures. The '40' region lies on Kalahari sands with rainfall ranging from 350-500 mm per annum. Use of wood, for construction of homestead palisades and for fencing agricultural land, is intense and deforestation has been well documented (Antilla **). Fencing croplands provides the most value for the wood used (Marsh **). Economic analyses suggest that the value of wood used from the common resource pool is far higher than the cost would be if modern wire fences were used (SDP*). However, tradition dictates that wood is used and even wealthy businessmen have their modern house and a traditional palisade homestead to maintain their heritage. Consequences of this tradition include forced transition to use of alternative resources for fencing, e.g. palm fronds, and alternative fuel such as

cattle dung. Other consequences are a switch to alternative building materials, e.g. cement and bricks, and modern wire fences.

Napcod, and its associated project Rap (Regional Awareness Project implemented by DRFN with German funding), has promoted awareness about these facets of deforestation. Living fences are one alternative Rap has incorporated into a brochure and awareness activities. This was done in conjunction with the Northern Namibia Forestry Committee and its members from government and the ngo sector.

A promotion of fuel efficient stoves has been very effective, undertaken in conjunction with German-funded Regional Biomass Energy Conservation, ProBEC implemented in Namibia by DRFN (**Catherine's report). The Steering Committee of this project includes government and the private sector and is chaired by the Ministry of Mines and Energy. This project included training in stove making, stove promotion and marketing, participatory research and demonstration of the value of these stoves and general business practice. The savings in time and energy for women and the conservation of natural woody vegetation are key links in this project. Napcod III has taken on this programme in partnership with an engineering firm, ngos and government.

Livestock have always been a part of peoples' livelihoods in north-central Namibia. Goats and chickens are used by the household or sold for ready cash and are often managed by women. Cattle, on the other hand, have cultural value and are primarily managed by men (Williams **). As an adaptation to variable climate and patchy rainfall, herds are often split-up and parts of one person's herd will be managed with parts of other people's herds. Sale of livestock on the formal market has always been constrained by veterinary restrictions although sale on the 'bush butchery' gains more money per head than in the formal market. Livestock numbers have paralleled the increase of human population since the early 1900s (SDP*). A key element of the socio-economic situation is high mobility of people living in this region. For the latter half of the 1900s, a system of migratory male labour was firmly entrenched while women were restricted to the northern regions. Management practices established during that period are reinforced by the current high degree of 'absentee' farming with decision makers and owners of livestock, mainly males, maintaining control over assets from a distance while they earn a living in town.

Livestock management has been the focus of the Sustainable Animal and Range Development Project, a sister project to Napcod, also funded through GTZ. Most Napcod activities related to livestock build on Sardep activities. Napcod has undertaken participatory research on the relationship of livestock and land productivity, e.g. their negative impact on establishment of woody vegetation (SDP*), and on the ancillary social and biophysical impacts of illegal fencing of communal land by large livestock owners (SDP*). This information is available to

local communities through Napcod's local facilitators as well as the established networks in northern Namibia and nationally.

Western Namibia: Approximately 20% of Namibia's population is dependent on twelve westward-flowing ephemeral rivers originating in the central highlands and flowing through the Namib Desert into the southern Atlantic (Jacobson *et al.* 1995). Inland from the desert, at somewhat below 100 mm mean rainfall, farming begins. Small and large livestock are the focus while wildlife and tourism present major activities for alternative incomes. Pilot areas of Napcod all fall within western Kunene Region. Prior to the 1900s, this region was used on a seasonal basis by people and livestock rather than being permanently settled. Permanent settlement was established with implementation of the separate development policy in mid-century and people have coped with various policy changes since then. Some land was demarcated as commercial farms, fenced and water developed, and then returned to communal management (Kambatuku, Kamwi **). In these instances several families tended to remove all internal farm fencing and manage one farm as a single communal unit. Other land was always managed communally. Water represents the focus of village development, whether it be along the ephemeral rivers or at boreholes. This has been reinforced by establishment of Water Point Committees as a new management structure introduced by government since independence.

Decision making over livestock management, as in the north, falls to males. Since absenteeism is even more developed in the west, management often falls to women and children or hired herders. In this area, absentee farmers usually hire herders from other, higher rainfall areas of Namibia. On one hand this is to prevent theft of livestock as animals cannot be disposed of rapidly (Murorua pers. comm.) but also means that herders are not experienced in use and management of livestock in low rainfall rangelands. In times of serious drought it is usually males who make arrangements for emergency grazing or long-distance movements to distant areas. As southern Kunene falls outside of the veterinary regulated area, livestock sales should be facilitated. However, poor veld condition, contributing to low prices, and distance from markets inhibits sales.

Wildlife and spectacular scenery provide the opportunity for development of alternative income generating activities in the western catchments (!Guidao-Oab *et al.* 1996). Community-based natural resource management is most highly developed in this area and a number of conservancies have been registered by government on behalf of community organisations (ref. ***). Increasing population in these western areas is increasing pressure on all natural resources and affecting their overall income generating potential.

Objective 7 of Napcod II was 'identification and implementation of incentives to change human activities and support sustainable natural resources management.' Two major activities of Napcod were implemented under this objective. A study entitled 'policy factors and desertification – analysis and

proposals' (Dewdney 1996) was initiated by the Steering Committee. The aim of the study was to inform decision makers of the impact of policy instruments on desertification and make recommendations for reform. Key target audiences include politicians and senior/ mid-level public servants. Napcod served as the secretariate for the development of Namibia's Drought Policy and Strategy. Many aspects from the policy analysis and from implementation of Napcod were incorporated into the drought policy process and final document. These national level actions, incorporating Napcod's field experience, are thought to be amongst the most important of the Napcod programme.

Objective 8 of Napcod II was 'organisational management structure established and functional.' This objective was overseen by the 11 institutions of the Steering Committee and emphasised integrated approaches and participation.

The Project: Napcod Phase III

The NGO consortium of the Desert Research Foundation of Namibia (DRFN) and Namibia's Economic Research Policy Unit (NEPRU) are implementing three main components of the national programme (1999-2003), including the development of tracking and monitoring systems of desertification in Namibia, and capacity strengthening of CBOs and Sos to combat desertification and manage natural resources sustainably.

The consortium team of Napcod III is mainly working in three pilot areas in northern, western, and southern Namibia with planned input in the east. The pilot areas are situated in communal farming areas in six of thirteen regions in Namibia, namely Erongo, Hardap, Karas, Kunene, Omusati and Oshana but individual interventions also take place in other regions. Napcod III is mainly operating at pilot sites that have been involved in the Sustainable Animal Range Development Programme (Sardep) of the MAWRD since the early 1990s. Sardep seeks to bridge the gap between community-based organisations and service organisations in support of sustainable agriculture. Napcod continues to support this objective.

The way forward

During Napcod phase III the initial monitoring system is being furthered and improved. A livelihoods approach addressing social, human, financial, physical and natural capitals is being implemented. For ease of discussion, the main areas of investigation and action are described below. In practice these are undertaken in an integrated manner. Namibia's Monitoring and Information System (Namis) is being tested, applied and adapted to different ecosystems in the main pilot regions. This approach involves working with local farmers and other community members to establish an information baseline and identify indicators for further research and monitoring.

Habitat/ range condition: A broad ecological baseline is being established at the various study sites and the most discriminating indicators are being identified. Based on these, components that can be measured by local farmers are elaborated. Various indicators are under consideration, including animal and vegetation based surrogates. However, it needs to be acknowledged that the identification of reliable indicators and surrogates is extremely difficult.

Sustainable use of other natural resources: As the majority of Namibian households depend on the use of natural resources for their living, either for subsistence or commerce, it is important that the renewable resource base is managed in a sustainable manner. The monitoring of resources is therefore of vital importance. Water is one of such crucial natural resource. The usage of potable ground and harvested water is important to understand, for example consumption patterns, and ultimately to take management decisions to wisely use and protect the resource. Other crucial parameters are the consumption of wood, either for buildings, fuels or material for handicrafts. Various resources are being included in the monitoring systems now being developed at the partner communities in the Napcod III pilot regions. Water, for instance, is a major concern at the Olifantsputs farm in the Kunene region, whereas deforestation is a primary concern in Uvudhiya in Oshana region. Relevant interventions, supported by Napcod, are underway at these sites.

Socio-economic monitoring systems: In the desertification context it is important to understand how livelihoods in Namibia depend on the natural resource base and how desertification constraints them. To identify viable alternatives to purely agricultural based livelihoods, the socio- economic situation needs to be well understood by farmers themselves to adapt their lifestyles. As these monitoring systems include personal data, it is essential that the farmers and community members identify with the need to track these. Involvement of all participants through the Namis approach helps but does not ensure this step. The socio-economic monitoring system to date includes information on household composition, assets, cash flows and rural- urban remittance dynamics. Information on livestock and crop ownership and dynamics are also included.

Development of training and management materials: Currently most of the monitoring systems are being developed in consultation with farmers and community members. However, the development of materials for training and improved management is resource intensive and multiplication of the approach is difficult. It is essential to develop appropriate materials that can be used by broader audience. It is equally important to offer management opportunities and options that can be used in response to the monitoring of both bio-physical and socio- economic aspects of the environment.

B. Scale

C. Power and influence

D. Uncertainties

Throughout the implementation of Napcod and other programmes, there is a high level of uncertainty. Ten years after independence, many of the promised developments have not materialised so uncertainty concerning future livelihood possibilities remain. Generally, people are beginning to realise the improvements will not all come from government and initiatives are being taken. Diversification is one component although identification of alternative income generating activities appears to be infrequent.

Natural hazards affecting livelihoods are understood at least in outline, but many occur only infrequently, e.g. flooding of ephemeral rivers or over-bank flooding of perennial rivers, and are often ignored until too late. Changes introduced through changes in policy, regulations and institutions are manifold and have become a way of life for most rural farmers. Uncertainty is reduced by imbedding these changes within the tradition system, a process that is more strongly developed in some parts of Namibia, e.g. the north, than in others, e.g. the west.

E. Integration of ethnoscience and formal science

Examples of the integration of ethnoscience and formal science have informed this document throughout. In addition, the following description of ongoing monitoring is elaborated. The development of practical systems to monitor the natural resource base are seen as essential to equip farmers with reliable management tools for use on farm. A decision making support system needs to be established that allows the farmer to make informed decisions, for example concerning grazing areas and water resources. Whereas it is essential to develop reliable monitoring tools for formal science, it is equally important to develop systems that can easily be adopted and applied by farmers.

The Backbone to Monitoring

During the second phase of Napcod, a pilot study was conducted at commercial, communal and so-called Odendaal farms – farms that were under commercial land tenure for 20 years before being incorporated into communal areas. The study area was located in northwestern Namibia, in southern Kunene region, formerly known as Damaraland. The three main study sites are situated in an area of relatively similar range of 150 – 250mm mean annual rainfall and on similar parent material, predominantly gneiss. Vegetation types are also comparable. Livestock farming is the main land use, but small rainfed and/ or irrigated vegetables gardens are maintained in exceptionally good rainfall years.

The purpose of the pilot study was to determine reliable indicators of habitat/ range condition in a scientific manner, to compare the results and methods with locally used ones, and to develop needs- based natural resource monitoring systems with local farmers. The scientific approach used bio- physical and biodiversity indicators to determine habitat / range condition.

The main findings from the pilot study (Hamukwaya, 1998; Paranzee, 2000; Zeidler, 2000; Zeidler *et al.*, 2000):

- Local farmers see a need for monitoring their natural resources. They are interested in developing such systems, often have a profound knowledge of the ecology and processes on their farms and they are keen to develop management systems that allow them to use resources in an adaptive manner.
- Traditionally farmers use vegetation based assessments to determine range condition. These methods are usually promoted by Agricultural Extension (AE). However, the pilot study showed that the use of a broader set of indicators in the form of an index (here Index of Biological Integrity, IBI), including measurements of soil resilience, vegetation productivity and invertebrate biodiversity, were superior in discriminating areas that were degraded versus areas that were less constrained. In variable environments, which are predominant in Namibia, vegetation is often inconspicuous in years of little rain, and thus vegetation indicators are not useful in determining whether or not an area is degraded. A place that looks totally overgrazed today might flourish with palatable forage after adequate rains.
- Areas under high land use intensity were more constrained than areas under light land use. This was particularly true on communally managed farms.
- Land use intensity was not directly related to stocking numbers *per se*. The opportunity to move animals to 'emergency' grazing areas, especially during periods of prolonged drought, was crucial for good management. Communal farmers often have less access to such 'emergency' areas.
- It is important to reveal the constraints to farming in the various areas. Communal management of natural resources is difficult, as ownership and use of natural resources and distribution of profits are not always equal.
- Besides monitoring of habitat/ range condition, other aspects of natural resources, such as socio- economic aspects, should be monitored. Farmers in the Grootberg area in north- western Namibia, who are situated in a conservancy area in which they have rights to use wildlife and generate wildlife related incomes, are interested in wildlife, habitat and impact monitoring. Impact monitoring relates in this case to establishing whether conservancy related opportunities do in fact help improve livelihood security and household incomes in the community sustainably.

- Monitoring systems must be adapted to needs. Scientifically sound indicators have to be linked to easily monitored surrogates, and methods must be designed for easy implemented and use by farmers, some of whom are illiterate.
- It is important to also provide guidance in solution finding and management opportunities. Often these are related to policy issues in Namibia.

F. Lessons Learnt

Livestock and range management: In an environment as variable as Namibia's in its climatic conditions, adaptive management and tracking of stocking numbers according to resource availability are essential.

Forage production on a farm can vary drastically from year to year as well as spatially, depending directly on the rainfall received. Appropriate management practices have been tested, implemented and disseminated to farmers throughout Namibia. Some of the key elements include:

- Increase of fodder, e.g. through supplements or enhancing local fodder production,
- Reduced fodder in- take during droughts through management actions e.g. shifts in water regimes, improved health and husbandry of well adapted breeds,
- Development of livestock movement strategies, including rotational grazing practices,
- Marketing of animals in an adaptive fashion, including interventions on the micro- and macro- economic levels to offer conducive opportunities and incentives to farmers,
- Diversifying and improving agricultural production on farm, especially in the communal farming areas,
- Complementing purely agricultural dependent livelihoods with off- farm economic opportunities e.g. through Small- and Micro- Enterprise development.

Training courses in livestock and range management have been conducted and are being undertaken at all pilot sites, both by Sardep and Napcod. The experience exchange and sharing of lessons learned among the farmers are being fostered through farmer visits.

Diversified livelihoods and incomes: The promotion of off- farm opportunities is essential to natural resource management in Namibia. Wildlife product based

opportunities are for example the target of the Conservancy and Community-based Natural Resource Management programme of MET and various partners. Community-based tourism is one component of this approach. As tourism is a fairly high input industry, the sector is still primarily dominated by foreign and large investors. It is important to further develop the approach and to create more real opportunities for marginal and often fairly unskilled communities and individual community members in this industry. This again requires an extremely resource intensive development input.

Other SME opportunities need to be facilitated. In Namibia, where infrastructure in the rural areas is often poor, population size and economic purchasing power are low and makers for most products are generally small, SME promotion is a challenge.

In Uuvudhiya constituency in northern Namibia, Napcod, the Regional Awareness Project and Stewart Scott Engineers supported young entrepreneurs from the constituency in the establishment of rural production sites and sales business for fuel-efficient stoves (right). This initiative was started on demand of the local people in the hope to combat deforestation and a lack of access to appropriate technologies.

It is important to involve stakeholders that are experienced in economic and business development in such activities that are indirectly related to combating desertification.

Building partnerships to combat desertification: It is clear that to effectively control desertification, partners from all walks of life and discipline have to work together. Desertification cannot be seen as a bio-physical phenomenon only; it needs to be addressed in a livelihood and rural development context in order to bear lasting fruits. In Namibia, network platforms on various levels are being established to facilitate information exchange, co-ordinate interventions and form partnership projects on all levels. Firstly, it is important to identify the real needs and concerns of rural households and CBOs. These need to be communicated to the service organisations, both public and private, in order to develop needs-oriented and appropriate services.

Secondly, the co-ordination of and collaboration in service provision are essential. Partners from various departments and disciplines need to work together to deliver suitable goods.

The fostering of fuel-efficient stove business in Uuvudhiya constituency, for example, required a multi-disciplinary approach, involving a private engineering firm to provide production training, an SME network to identify and help contract a SME trainer, and Napcod and RAP to help identify the communities' needs and co-ordinate the activities on site in support of the regional councilors and traditional leaders of the area. For the compilation of appropriate and community-friendly training materials, the Communications Unit of DRFN was contracted.

Most of the key players are also part of the national Napcod Counterpart Network, which meets once a month and maintains a monthly e-mail newsletter

hosted by one of the Network members, the Meatboard of Namibia, a commercial enterprise. In the north, two regional networks, supported by Napcod and others, bring together all regional environmental organisations, political and traditional leaders and decision makers around one table. The Northern Namibian Forestry Committee and Oshana Regional Natural Resource Management Committee operate in northern Namibia. In Uuvudhiya constituency itself, a constituency development committee as well as committee for range development and natural resources (Okomitiye Yelungameno L'Omalundu Niimuna) are in place. These are well established CBOs that were partially supported by Sardep in their initial phase, and which are operational to date.

Lessons learned in the UNCCD context: **Namibia can now look back on a decade of new interventions and testing of various approaches to community- based natural resource management, rural development, SME promotion, conservation and sustainable use of biodiversity, all ultimately adding up to the struggle against desertification. The major lesson learned is that all these issues relate ultimately to livelihood security and poverty alleviation. The realisation of human aspect of the environment leads to the development and refinement of people centered approaches and methodologies. The development of well- targeted training and information materials, the creation of true opportunities at the grass- roots level, and the facilitation of communication, information exchange and collaboration and support amongst all stakeholders is essential. Furthering conducive policy environments that reach out to the people in rural areas is equally important.**

The main trend had been pro- active: working with ongoing local and national plans, projects and initiatives to facilitate and implement activities conducive to better understanding of land degradation and combating desertification in Namibia, rather than spending time and resources in the detailed development of national action policy documents. This notion has been carried forward in the implementation of all of the environmental conventions ratified by Namibia. Most of them are being implemented in close collaboration and are cross- cutting in their nature. Namibia, for example, has a "Conventions Synergy Committee", which helps create synergy between various convention related activities.

Over the past decade, Namibia has learned many lessons through the implementation of various environmental conventions and related programmes. These are brought forward through a continuous monitoring and evaluation process that direct future interventions, and which is shared throughout the SADC region.

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