Economics of Land Use

Financial and Economic Analysis of Land-Based Development Schemes in Namibia

COOPERATION REPUBLIC OF NAMIBIA FEDERAL REPUBLIC OF GERMANY

gtz

Published by:
Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH, Namibia
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Windhoek, December 2006

Acknowledgements

We would like to express our gratitude to the numerous people who gave generously of their time during the preparation of this study by providing us with important information and assistance. These people include support staff from line ministries and organisations involved in land management and utilisation, and in particular, many farmers, project staff, community members, extension officers and people in public and private companies who provide services to the agricultural community. Without their guidance and assistance this study would not have been possible. A list of all the people who shared their knowledge and experience with the teams can be found in Annexure 1 on the accompanying CD.

A special word of thanks must go to the GTZ office in Windhoek. Albert Engel initiated this important project and guided it throughout its execution. Marysia Avis must be thanked for providing efficient logistical support in her usual patient and friendly manner.

Economic models rest on assumptions and large amounts of data. Possible misrepresentation and/or misinterpretation of facts and data remain the responsibility of the authors alone.

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Abbreviations and Acronyms

AALS	Affirmative Action Loan Scheme
ACLRA	Agricultural (Commercial) Land Reform Act, 1995
AEZ	Agro-Ecological Zone
CBNRM	Community-Based Natural Resource Management
CBO	Community-Based Organisation
CBTE	Community-Based Tourism Enterprise
CC	Communal Conservancy
CDC	Constituency Development Committee
CF	Community Forest
CFNEN	Community Forests North-Eastern Namibia
CFT	Communal Forestry Team
cites	Convention on International Trade in Endangered Species
CLB	Communal Land Board
CLRA	Communal Land Reform Act, 2002
CRIAA	Centre for Research-Information-Action for Development in Africa
Cumec	Cubic metre per second (flow rate of canals, rivers, etc.)
DDR	Directorate of Deeds Registry (MLR)
DEA	Directorate of Environmental Affairs
DEA	Draft Environmental Act
DEES	Directorate of Extension and Engineering Services
DLR	Directorate of Land Reform (MLR)
DPRTIS	Directorate of Planning, Research Training & Systems Coordination (MLR)
DRFN	Desert Research Foundation of Namibia
DRR	Directorate of Resettlement & Rehabilitation (MLR)
DSM	Directorate of Survey & Mapping (MLR)
DWA	Department of Water in the MAWF
EIA	Environmental Impact Assessment
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FIRM	Forum for Integrated Resource Management
FMB	Forestry Management Body
FMC	Forest Management Committee
FY	Financial Year
GDP	Gross Domestic Product
GM	Gross Margin
GoN	Government of Namibia
GPS	Global Positioning System
GRN	Government of the Republic of Namibia
GS	Green Scheme
GSA	Green Scheme Agency
GSD	General Services Division (MLR)
GTZ	Deutsche Gesellschaft fuer Technische Zusammenarbeit

HA/ha	Hectare
HACCCS	Human-Animal Conflict Conservancy Compensation Scheme
HWC	Human-Wildlife Conflict
IDC	International Development Consultancy
IR	Individual Resettlement
IRDNC	Integrated Rural Development and Nature Conservation
IRR	Internal Rate of Return
LAC	Land Acquisition Committee
LIFE	Living in a Finite Environment
LRAC	Land Reform Advisory Commission
LSU	Large Stock Unit
MARDI	Mashare Agriculture and Rural Development Institute
MAWF	Ministry of Agriculture, Water & Forestry
MAWRD	Ministry of Agriculture, Water & Rural Development
MDG	Millennium Development Goal
MET	Ministry of Environment and Tourism
MLR	Ministry of Lands and Resettlement
MLRR	Ministry of Lands, Resettlement & Rehabilitation
MOF	Ministry of Finance
MRLGHRD	Ministry of Regional and Local Government and Housing and Rural Development
N$	Namibia Dollar
	(Approximate exchange rate in Sept/Oct 2006: 1 N$= 0.13 USD = 0.104 Euro)
NACOBTA	Namibia Community-Based Tourism Association
NACP	National Agricultural Credit Programme
NACSO	Namibian Association of CBNRM Support Organisations
NAFWU	Namibia Farm Workers Union
NAP	National Agricultural Policy
NAU	Namibian Agricultural Union
NDC	Namibia Development Corporation
NDP 1 & 2	National Development Plan 1 & 2
NDT	Namibia Development Trust
NGO	Non-Governmental Organisation
NLP	National Land Policy
NM	Net Margin
NNDF	Nyae Nyae Development Foundation
NNF	Namibia Nature Foundation
NNFU	Namibia National Farmers' Union
NPC	National Planning Commission
NPRAP	National Poverty Reduction Action Programme
NRM	Natural Resource Management
NRP	National Resettlement Policy
NRP	National Resettlement Programme
NSIS	North–South Incentive Scheme
NTB	Namibia Tourism Board

NTFP	Non-timber-forestry-products
p.a.	per annum
PNRA	Participatory Natural Resource Assessment
PPP	Private-Public Partnership
PRA	Participatory Rural Appraisal
PRSN	Poverty Reduction Strategy for Namibia
PTT	Permanent Technical Team
RDCC	Regional Development Coordinating Committee
RMU	Regional Management Unit
RPRP	Rural Poverty Reduction Programme
RRC	Regional Resettlement Committee
SADC	Southern African Development Community
SAIEA	Southern African Institute for Environmental Assessment
SRT	Save the Rhino Trust
SSCFU	Small Scale Commercial Farming Units
SSU	Small Stock Unit
TCLSI	Technical Committee on Land and Social Issues
UNAM	University of Namibia
V 2030	Vision 2030
VCF	Veterinary Cordon Fence
VDC	Village Development Committee
WASP	Water and Sanitation Policy
WILD	Wildlife Integration for Livelihood Diversification Project
WWF	World Wildlife Fund

0 EXECUTIVE SUMMARY

The Government of the Republic of Namibia has formulated several land-based development schemes in order to support policy objectives related to land reform, sustainable use of natural resources and higher productivity of land use. Some of these schemes are still at the formulation stage, some have been partially implemented and others have been in full operation since 1990.

The most prominent land-based development schemes include:

a) Development of small scale commercial farming units
b) The "Green Scheme"
c) Communal conservancies
d) Community forests
e) Resettlement schemes
f) Affirmative Action Loan Scheme

For most of these schemes, studies have worked out basic investment costs. However, the need for a more detailed financial and economic assessment led to the initiation of this study. The objectives of the study and the particular tasks carried out by the six consultants (three teams) are summarised in the table below.

Table 0.1: Objectives and tasks of the study

Objectives	Tasks
1) Review different land use schemes by conducting detailed economic analysis of land use options prescribed under the various schemes 2) Understand the factors contributing to the sustainability of different land use schemes, given development policies, tenure rights and livelihood patterns 3) Prepare a more in-depth financial and economic analysis for selected schemes 4) Recommend how land use options could be made more economically viable, taking environmental, social and technical issues into account	1) Describe the range of land use possibilities pursued under each scheme and identify typical, representative, real case models for analysis and extrapolation within this range. 2) Describe the positive and negative impacts of each land use scheme and the factors contributing to sustainability (including policies, government support, tenure rights and livelihood patterns) 3) Assemble and review existing financial and economic data and publications and summarise the information available on each land use scheme/model. 4) Identify data gaps for the analysis of each model to establish: - benefits and costs in different land uses for selected time periods - financial profitability measures (net income/profit, financial rates of return, net present values) for single users as well as for entire scheme/conservancy - economic viability (annual contribution to the national income, economic rate of return; net present value) - socio-economic impact on the community - factors contributing to differences between "pure" models and existing schemes 5) Collect data required (e.g. through expert interviews and household surveys among beneficiary groups) 6) Assess the financial and economic viability of each model and, through sensitivity analysis, identify key enterprise characteristics, risks, and factors that could help to increase viability 7) Present the results to key stakeholders

The three consultancy teams worked under supervision of a steering committee composed of representatives of the following institutions: MAWF, MLR, MET, RPRP Project, Green Scheme Agency, NNFU, NAU and GTZ. The consultancy (joint mission of all teams) in Namibia was carried out between 18 Sep-

tember and 13 November 2006 (plus analysis and reporting). During this time, the consultants collected all necessary data through expert interviews. Consultants then developed financial and economic models of the selected land reform options or land use systems and assessed the financial and economic viability of the various schemes. The results are presented in this report and will be summarised in the following paragraphs. All models and electronic resources that were used for the analyses are provided on the accompanying CD.

Development of small scale commercial farming units

Under this Ministry of Lands and Resettlement (MLR) programme, communal farmers can obtain access to commercial grazing units in communal areas. It is estimated that approximately 5 million hectares are available for development into small scale commercial farming units under this scheme. Once developed, allotments will be allocated to potential farmers who will enter into a lease agreement with the government. Surveying and other preparatory work has commenced in some of the identified areas.

The major profitability coefficients elaborated for the different scenarios can be summarised as follows:

Table 0.2: Summary of profitability coefficients for cattle farming

		Carrying Capacity: 15 ha/LSU				Carrying Capacity: 10 ha/LSU			
		Commun.	Low	Medium	High	Commun.	Low	Medium	High
Assumptions									
Calving rate	per year	0.4	0.5	0.6	0.7	0.4	0.5	0.6	0.7
Marketing age of male offspring	months	60	54	48	24	60	54	48	24
Meat price for male offspring	N$/kg	14	14	14	20	14	14	14	20
Annual income per 1,000 ha									
Gross Margin per cow	N$/cow y	973	1,093	1,194	1,446	973	1,093	1,194	1,446
Number of cows kept*)	(Ø/y)	36.41	34.76	33.77	40.33	54.61	52.14	50.65	60.50
Total Gross Margin of herd	N$/y	35,431	38,005	40,312	58,336	53,146	57,007	60,469	87,504
Profit of farming	N$/y	23,431	3,378	5,686	23,709	41,146	22,381	25,843	52,877
Return on investment									
Financial Rate of Return	%	-	2.15%	2.88%	8.24%	-	6.28%	7.09%	12.95%
Economic Rate of Return	%	-	6.59%	7.26%	12.42%	-	9.82%	10.58%	16.40%

Summarising the conclusions reached, it appears that individual cattle farming on a low or medium productivity level (similar to the conditions in the communal areas) can only be financially and economically viable where carrying capacity dictates that less then 10 ha per LSU are required. For less favourable areas, production and marketing strategies should be improved to secure profitability (high level productivity). If conditions dictate that more than 15 ha of grassland are required per LSU, despite improved production and marketing, cattle farming will only be profitable with subsidies.

The following major keys to financial success and economic viability were identified.

Productivity (calving and weaning)

Raising the calving rate from 0.5 to 0.6 calves per cow per year would increase the gross margin per cow by 13%. However, during the interviews with the farmers in the Mangetti Scheme, it was found that the productivity is very low but knowledge about the herds and the reproduction is also insufficient. Since knowledge and awareness of productivity (in terms of calving and weaning rate) is an essential precondi-

tion for improvement, the introduction of a simple herd record system is strongly recommended. As a proposal for such a system, some examples for record sheets are provided as Annexure 3 on the CD.

Marketing and meat quality (age and fat condition of the animals)

Commercial farming requires market orientated production in order to obtain the best possible prices. Animals must be in optimal condition when they are sold. Unfortunately, in the communal areas and even in the Mangetti Scheme, farmers have no need to obtain a regular income from cattle farming and cattle are regarded as an investment and so are not farmed with marketing in mind. As long as this remains the prevalent attitude even for (so called) commercial farmers, sub-optimal marketing (selling old animals in poor condition) will remain the major reason for low profitability. Since, in general, profitability is decreasing in line with the decreasing carrying capacity of the rangeland, realising best possible meat prices increases in importance as the natural conditions deteriorate. Where more than 10 ha are required per LSU, marketing only old animals for prices below N$15/kg of meat will be unprofitable.

Carrying capacity of the grassland and supplementary feeding

The carrying capacity of the grassland plays an important role in profitability and income generation. However, in commercial farming, the carrying capacity of the grassland does not necessarily represent the absolute maximum number of cattle that may be kept. Supplementary feed can be used to supplement the natural potential of the grassland. Effective supplementary feeding goes beyond the use of mineral and vitamin licks. Purchased feed, like hay or even grain concentrates, helps to avoid animal losses during dry periods and the optimised use of vitamins, minerals, protein and energy concentrates can be very effective in producing high quality beef. It is highly recommended that this issue be further investigated, particularly with regard to financial viability, logistics and organisational requirements as time did not permit during this study.

Financing the initial investment

In general, the projected cattle farms have the potential to earn a return on the capital invested, i.e. no capital would be lost. However, in most cases, this return will be below the hurdle value of 8% (being costs of capital) unless the farms are located in high carrying capacity areas (<10 ha per LSU) or the farmers achieve a high productivity level and produce market orientated (young) animals. Since the economic returns are more positive then the financial results, governmental subsidizing can be taken into consideration. However, subsidising should not lead to inefficient utilisation of the grassland. Thus, the less favourable the natural conditions of the rangeland (in terms of carrying capacity), the more important improved cattle husbandry and marketing strategies become to efficient farming. Therefore, subsidising loans (with reduced interest rates and/or grace periods) may be more advantageous than subsidising farm infrastructure, and may lead to improved cost effectiveness.

Training

If record keeping, market orientated production, supplementary feeding and the use of loans in cattle farming are recommended, it follows that training will be needed. For this reason, it is crucial for the financial and economic viability of cattle farming that adult education training measures are developed and training materials as well as simple farm management tools (like record keeping sheets) are implemented. Adult education training measures could be associated with subsidised inputs or even made compulsory for loan or subsidy recipients.

Farm size

The income generation potential of a farm is not only a question of the land that is available, the carrying capacity of the land or the size of the herd. The efficient utilisation of resources is also vital. Under favourable natural conditions (<10 ha/LSU) 1 000 ha may generate a substantial income; if farming conditions are less favourable, larger farms will be necessary. However, farming at a low or medium production level where the carrying capacity is low (>10 ha/LSU) is not profitable anyhow, since the return on the capital investment is insufficient – even on large farms. Thus, in less favourable farming areas, the improvement of production and marketing practices should be emphasised, rather than increasing the size of the farming units. In less favourable areas, a unit size of 1 500 to 2 500 ha would be insufficient if the farm is run on a low production basis, but this unit size could potentially generate sufficient income if production and marketing processes were improved. If more than 15 ha per LSU are needed, a profit could only be achieved under improved production and marketing conditions – but even then, the income generated could not compete with farming under communal conditions. This raises another possible solution to the problem of unutilised land for cattle farming: unfenced communal farming on the projected land, instead of fenced individual farming. However, the data collected for this study does not allow for the assessment of this option since the analysis of the financial, economic, social and traditional conditions of communal farming was not part of this study. Certainly, this warrants further investigation.

The Green Scheme

The Green Scheme is an ambitious undertaking by the Ministry of Agriculture, Water & Forestry (MAWF) to develop the substantial irrigation resources along the country's perennial rivers. Most of the land available along these rivers falls under the communal tenure system. Over the next 15 years, 27 000 ha are scheduled to be added to the existing 8 600 ha of irrigation land. Approximately 1 500 tenants will be given leasehold status for up to 99 years. Private commercial investors are to be given leaseholds in these irrigation projects to manage and run the core estate as private-public partnerships (PPP) over a limited number of years. The PPPs will oversee the initial operation of the scheme, advise smallholders, provide inputs, and assist with the marketing of the produce.

The major profitability coefficients for a complete unit (service provider plus small scale farmers), according to a varied proportion of horticultural crops grown, can be summarised as follows:

Table 0.3: Summary of profitability coefficients for Green Scheme – complete unit (200 ha)

Proportion of hortic. crops		0%	5%	10%	15%	20%	25%
Total Gross Margin	N$/y	1,450,000	2,116,538	2,783,075	3,449,613	4,116,150	4,782,688
Profit of farming	N$/y	-143,647	419,950	983,547	1,547,144	2,110,741	2,674,338
PoF excl. depric. for off-field infrastr.	N$/y	414,687	978,284	1,541,881	2,105,477	2,669,074	3,232,671
Financial rate or return (total capital)		-4.2%	2.9%	8.6%	13.7%	18.5%	22.9%
Fin. Net Present Value (total capital)	N$	-9,752,848	-4,566,775	619,299	5,805,372	10,991,445	16,177,519
Economic rate or return		1.7%	8.1%	13.6%	18.7%	23.4%	28.0%
Economic Net Present Value	N$	-5,066,313	51,608	5,169,530	10,287,451	15,405,373	20,523,294

Data analysis identified the following criteria as keys to success and viability (both financial and economic):

High value crops

Both, the financial and the economic analysis showed clearly that an orientation towards high-value crops is essential for the successful implementation of the green scheme initiative. Since there is little local experience with vegetables and fruit, agronomic trials in different agro-ecological zones and appropriate financial analysis should be carried out as soon as possible to identify potential crops.

As interest subsidies for loans will be reduced and then removed after the first four or five years of a loan, it is important that vegetables and fruit are introduced immediately and not phased in too slowly to avoid projects failing simply due to financial liquidity problems.

Marketing

At present, no marketing channels are in place for the high value crops regarded as essential for the Green Scheme initiative. In the case of Etunda, for example, individual small scale farmers market their vegetables at local markets in the villages and towns, but joint methods of marketing the products of small scale farmers and/or service providers must be developed – especially for high value crops (which must usually be of high quality). It is strongly recommended that (a) small scale farmers be assisted in forming marketing cooperatives and that (b) marketing studies be carried out as soon as possible, preferably with the assistance of the Agronomic Board.

Finance and subsidies

The present system provides good opportunities for interested service providers and small scale farmers. Such incentives are regarded important attract potential service providers. However, the service provider bears a disproportionately high share of agricultural expenses that benefit both parties, such as the maintenance of off-farm infrastructure and the fixed costs for the machinery. Ways to improve the allocation of costs for shared equipment (such as an updated calculation of the mechanisation service rate, or the introduction of “rent” to be paid by small scale farmers for land and infrastructure) must be determined.

Training

The Mashare Agriculture and Rural Development Institute (MARDI) curriculum was made available to this study and is attached as Annexure 4 (on the CD). The curriculum as a whole is comprehensive and well-elaborated; however, there are two areas which could be developed further.

Since the production of vegetables and fruit plays a major role in the Green Scheme, it seems advisable to place more emphasis on this. The special requirements and production practices for *individual* horticultural crops should be documented in detail so that the farmers have something like a reference book for their later practical work.

The second issue relates to farm management. The curriculum contains quite comprehensive theoretical information in the field of documentation like record keeping, the calculation of profit and loss, and finance, however, if a small scale farmer is to be a self-sufficient entrepreneur, he or she needs knowledge and tools for decision making. For this reason, it is essential to develop and teach an easy-to-use gross margin analysis system that incorporates all costs and revenues relevant to a specific crop on a specific plot in a specific season which can be used for decision making and planning of future activities. It would also provide a valuable record.

Communal conservancies

Communal conservancies enable rural communities to gain control over and benefit from game and tourism in protected areas. There are currently about 44 conservancies in operation, covering about 1/3 of all communal land.

The major profitability coefficients elaborated for the five conservancies that were analysed can be summarised as follows:

Table 0.4: Summary of profitability coefficients for communal conservancies

Conservancy:	Torra	=/Khoadi //Hôas	Nyae Nyae	Mayuni	Salambala
Project financial values					
Initial capital investment	2,377,955	1,066,943	3,882,102	955,746	1,733,637
Annual Gross Income [a]	1,657,045	525,257	742,702	784,240	589,771
Variable Financial Costs [a]	412,231	151,691	335,813	27,796	135,387
Fixed Financial Costs [a]	993,055	471,874	1,031,653	653,967	539,292
Annual Net Income [a]	251,758	-98,308	-624,765	102,477	-84,908
Project Financial rate of return [b]	11.10%	15.59%	11.29%	2.59%	2.93%
Project Financial net present value [b]	576,862	1,005,616	1,190,788	-643,848	-793,640
Community financial values					
Financial rate of return [b]	54.92%	126.24%	-0.62%	106.63%	12.78%
Financial net present value [b]	3,632,381	2,440,354	-982,717	2,673,568	279,179
Economic values					
Annual net value added [c]	1,146,490	171,048	-305326	442,994	229,683
Net value added per ha.	10.56	0.96	-0.34	140.07	20.88
Economic rate of return [b]	71.80%	33.28%	11.29%	45.34%	19.61%
Economic net present value [b]	638,2958	2,501,592	1,119,412	2,115,078	1,429,864

[a] Based on year 10

[b] Measured over 10 years (8% discount).

[c] Gross value added minus asset depreciation

Due to the projected net immigration of game during the ten years following the establishment of a conservancy, the economic rates of return tend to be far higher than the hurdle value of 8%. The financial rates of return attest to profitability in at least three cases, even if the annual net income, calculated on the basis of the tenth year after establishment, is low or even negative. This imbalance of the average annual financial result and the overall dynamic results may be explained by the quota allocations for trophy hunting. The increased value of the game is accounted for in the dynamic rates of return. However, utilising these livestock resources and converting them into cash income requires sufficient hunting quota allocations.

Communal conservancies currently face the following major constraints: (i) a lack of technical capacity in the conservancy committees and management, (ii) problems with membership and representation, (iii) inefficiencies in benefit and cost sharing, (iv) inequities in land use planning, (v) the need for greater co-operation between regions, and (vi) insufficient marketing.

Recommendations to overcome these constraints are offered in the following paragraphs.

Develop the technical capacity of the CC officials and members

Committees, management and members require technical training and extension support in order to utilise their full resource potential, Conservancies should be understood as business entities and therefore business management training for management is important.

Previously, most technical support to conservancies focused mainly on the management of wildlife and tourism. Conservancies should be seen as a strategy for the diversification of the rural economy which provides a variety of income opportunities for the local communities. This in itself presents new challenges and requires outside technical support to optimise the respective enterprises.

Membership and representation

The sustained success of communal approaches to resource use (conservancies and forests) will depend on the benefits that individuals and communities as a whole derive from this land use system. The representation of the conservancy population on committees will be important.
The law gives rights to conservancy committees but not to the community – this blurs issues of accountability and membership. Committees have upward accountability, but not outward towards the community. In a number of conservancies this has already led to a reorganisation of the structures and the election of committee members. Terms of reference for community representatives need to be both clear and approved by the broader conservancy population in order to achieve effective cooperation between committees and their broader communities.
Formal membership of a CC is unnecessary since all households in the area are affected by the increased presence of wildlife and all are supposed to adhere to the management plan in any case. In addition, the benefits distributed usually come in the form of contributions to communal facilities or projects, which benefit all members of the community.

Benefits and cost sharing

A number of conservancies currently receive tangible benefits, but in many cases they do not trickle down to individual households because the benefits per capita are too small and it makes more sense to support measures that address communal needs. Whilst it is important for the broader public to have a say in which communal projects are to be supported it is also important for the members' sustained commitment to conservation that CCs allocate resources to compensate households for wildlife damage.

The results from the financial and economic analyses show that three of the five conservancies (namely Torra, =/Khoadi //Hoas and Nyae Nyae) are financially viable. The economic internal rates of return for all conservancies are above the hurdle rate of 8%. The community rates of return are all significant, except for the Nyae Nyae conservancies. Annual changes in quota allocations cause fluctuations in one of the conservancies' major sources of income – trophy hunting – and this contributes to their precarious financial viability. Overall, conservancies are economically efficient, but provide low financial returns.

Land use and resource planning

It is the primary objective of conservancies to plan for the management and utilisation of wildlife in the area. Since the state bestows custodianship of wildlife upon conservancies, it does not make sense to withhold other resources from communal governance. For instance, CC residents have no jurisdiction over the plant life (such as forests, or devil's claw) on their land. The FIRM approach (Forum for Integrated Resource Management) is being piloted in a few conservancies and should become standard. In terms of

the FIRM approach, communities are empowered to plan for the sustainable use of all the potential resources within their respective areas.

Quotas for conservancies appear to be subject to annual fluctuations. The authorities responsible for quota setting should aim at more conservative estimates that can be maintained over a number of years. This would give CCs greater certainty and would enable them to draw up reliable business plans.

Regional cooperation

Most conservancies are affected by wildlife migration. Agreement must be reached between the different communities on how proceeds from trophy and own-use hunting are to be shared. Dimensioning and spatial design of conservancies is often based on aspects such as traditional authority boundaries and ethnicity. Whilst there may be merit in such decisions, regional collaboration is necessary to balance the income streams and to ensure the fair sharing of benefits between all communities in such areas.

Marketing

The conservancy concept has largely been driven and supported from a conservation perspective. Although tourism is by far the largest income generator for conservancies, the conservancy concept is not widely marketed. The NTB official website focuses on conventional tourism and contains no reference to conservancies at all. Other internet searches link CCs to hunting and conservation. Conservancies should be marketed in their own right. In addition, as game population grows, premium hunting could provide a substantial income and compensate for the reduction in trophy quotas.

Community forests

Over 260 000 km² of Namibia's land mass have been declared communal land and this area is home to approximately 68% of the country's population. About 28% of this area is forested and large sections are community forests and communal conservancies. Besides subsistence agriculture, many households living on communal lands in the north and north-east of the country depend on forest products for their household income.

Community forest legislation allows for rural communities to control and manage forest products and other natural resources of the forests in their areas and benefit financially from their sustainable utilisation. Unfortunately, little financial data on community forests was available for analysis, since for many communities forestry activities were new. However, some profitability coefficients have been elaborated that can be summarised as follows.

Table 0.5: Summary of profitability coefficients for community forests

	Income/ Profit (N$/y)	Area (ha)	N$ per ha	Total lab. income**	Labour units	N$ per LabU
Firewood present	40,750	70,259	0.58	40,750	80	509
Firewood future	70,750	86,280	0.82	70,750	80	884
Timber	250,000	86,806	2.88	250,000	80	3,125

** Income/Profit + Wages = Total labour income

Table 0.6: Summary of current income opportunities for various community forests

Community	Total Income	Income to FMC	Income to HHs
M'Kata	680,500	318,750	341,750
Bukalo	15,581	345	15,236
Masida	58,418	6,819	51,599

Major development constraints at the moment include (i) a lack of technical capacity in the CFs, (ii) a lack of access to finance, (iii) little or no access to markets, (iv) CF land in land use planning, (v) the legal status of communal forestry associations, and lastly (vi) the need to refine existing forestry products and to develop new forestry products.

Recommendations are made to overcome these constraints:

Develop the technical capacity of CF officials and members

CF officials and members require technical training and extension in order for their full potential to be utilised. A local skills base is necessary for the local processing of raw materials found in the community forests.

Facilitate access to finance

Opportunities for local processing would encourage entrepreneurial activities in the villages and create more income through employment. In order to support such development, support agencies need to facilitate potential local entrepreneurs' access to micro-finance facilities.

Facilitate access to markets

The basis for broad-based utilisation of timber and non-timber products is a thorough analysis of the actual resource potential in the various community forest areas. Such an investigation should lead to sustainable resource use projections for the medium-term. A professional forestry unit could then be established, to work throughout the region and to increase local value addition. The forestry unit should have the expertise to use raw materials to produce quality finished goods that are marketable in other regions of Namibia and our neighbouring countries.

Community forests offer a range of products, but at this stage there is little experience in marketing them. The value chains of each product should be analysed to determine which processing steps could be carried out locally and where each product should be sold. Some of the products may provide additional income and employment opportunities through local processing (adding value).

CF land in land use planning

It seems that the concept of a community forest has not been fully accepted by some individuals in positions of authority as a valid formal land use system. During the field visit, consultants were informed of two cases in which land already allocated to communities by the land boards for community forestry had subsequently been partially re-allocated for small scale commercial farming units without consulting the respective communities. It would appear that the legal status of these community forestry areas, which are based on contracts between the Minister of Agriculture, Water and Forestry and the respective FMC, is not recognised in land right terms. This may have to do with the ambiguous legal status of the FMC. These issues must be resolved.

Refining existing forestry products and developing new products

Most forestry and non-forestry products are sold as raw products. Considerable potential exists to process such products further; however this would necessitate a detailed analysis of potential markets. Community members would also require technical and financial support to acquire the skills and the respective technical capacities to process and refine their products.

Resettlement schemes

The resettlement programme involves the purchase of commercial farms by the Ministry of Lands and Resettlement and the subsequent subdivision and redistribution of these farms or allotments to different categories of previously disadvantaged people. The resettlement programme started in 1990 under the administration of the Ministry of Lands and Resettlement.

The programme has a two-pronged approach:

1) Group resettlement schemes
   A group of people belonging to the most disadvantaged category (no livestock, no income, no land) are resettled on a commercial farm. As a vulnerable community, the government supports them with inputs as start-up capital.

2) Individual resettlement schemes

   "Scale models" (economic farm models) developed by agricultural research guide the process of dividing large scale commercial farming units into viable livelihood units (allotments). The units are then allocated to potential farmers. Beneficiaries under this group are those who have income and livestock, but have no land to practise commercial farming.

Some major profitability coefficients for the surveyed farms are summarised in the table below. Additionally, results and findings taken from model calculations are also presented.

Table 0.7: Summary of profitability coefficients for surveyed resettlement farms

Land Use System*	Income/ Profit (N$/y)	Area (ha)	N$ per ha	Total lab. income**	Labour units	N$ per LabU	Financial IRR	Economic IRR
IR small stock 1	40,945	2,900	14.12	40,945	3	13,648	17.82%	*(models:*
IR small stock 2	-3,272	3,028	-1.08	-3,272	4	-818	-1.74%	*≈ -7 to 12%)*
IR large stock 1	-107,781	1,400	-76.99	-85,137	3.5	-24,325	-113.82%	*(models:*
IR large stock 2	47,643	1,028	46.35	72,843	3.5	20,812	36.40%	*≈ -3 to 13%)*

IR = Individual Resettlement; ** Income/Profit + Wages = Total labour income

There appears to be considerable disparity among farmers in their financial performance and in the extent to which they have been able to build up herds since taking occupation of their farms. Two of the farmers interviewed had greatly expanded their herds, had gross margins of more than N$60 000 and had positive net farm incomes. Two others had not expanded their herds at all and they had total gross margins of less than N$20 000 with negative net farm incomes. This does not necessarily mean that both farmers with negative net farm incomes make a loss each year. The depreciation costs assumed in the analysis were notional, and represent the amount of money that farmers should be saving annually to ensure that when the fixed assets need to be replaced, the necessary funds are available.

It seems unlikely that many resettled farmers save this money. Maintenance costs of resettlement farmers were surprisingly low, which suggests that they may not be maintaining their fixed assets properly. This situation could represent a financial time bomb – assets will reach the end of their useful lives more quickly and when this happens, most farmers will not have the means to replace them.

Sensitivity calculations were done for a 3 000 ha small stock farm in the south, and a 1 000 ha mixed farm (cattle and goats) in areas with a higher carrying capacity. The calculations examined two scenarios – high and low farm capacity utilisation. These scenarios showed that farmers are only likely to achieve a positive net income if they have strong managerial skills and if they are utilising the farm at close to its full capacity. Currently, it is probably the case that only a very small minority of resettled farmers, if any, have both a sufficiently high level of skills and high or optimal farm utilisation – the farm utilisation of most small stock farmers interviewed was low, in the range of 44% to 52.5%.

These findings underline the importance of monitoring the performance of resettled small stock farmers, and providing assistance to those who need it to encourage progress towards a "high managerial skills, high capacity" situation.

The results of the farm budget modelling suggest that farmers could, in principle, generate a profit from farms of the current minimum sizes (3 000 ha in the south and 1 000 ha in the central, northern and eastern regions), however, there is little chance of this being achieved by most resettled farmers as there is a serious lack of the necessary skills (technical and managerial skills) and/or financial capital. Making a profit with farms of these sizes is highly challenging. Minimum farm sizes should not, therefore, be reduced.

The fieldwork findings showed that for most small stock producers in the south, and also for some resettled farmers in the north, farm size is not the most pressing constraint. Instead, their most pressing constraints are that:

(a) they have not been able to build up their herds to the level that they believe their farms can support; and

(b) some farmers are not able to utilise all of their land due to a lack of functional water points on parts of their farms.

Water supply problems were identified by all respondents and constrained production and productivity due to water constraints appear to have a substantial, detrimental financial effect. The GRN/MLR should consider establishing a fund to finance resettlement farmers' interventions to reduce water constraints and increase farm income, provided that these interventions are environmentally sustainable. The fund should provide soft loans or partial grants: the farmer would be expected to cover some of the costs, since he or she would benefit financially from it. Relevant recommendations from the PTT should also be considered.

Most beneficiaries have very limited access to credit. In addition, the PTT noted that "In terms of the lease agreements, maintenance of farm infrastructure is the MLR's obligation, but budgetary constraints have held back this process." Beneficiaries are thus obliged either to pay for urgent maintenance and repairs from their own funds, or to allow broken equipment to remain out of action.

Beneficiaries require capital to cover maintenance and general operational costs, as well as the costs of acquiring additional livestock to increase their herds. If they cannot afford to purchase additional livestock their herds must increase more gradually through natural reproduction. However, if livestock is sold to generate capital for other purposes, herd sizes remain static over time – a "capital scarcity trap".

We endorse the PTT's recommendations on this subject, namely:

- "That lease agreements be given to beneficiaries as soon as they occupy their farms." (PTT, 2005b)
- "The MLR could introduce a loan guarantee fund for resettlement beneficiaries for the purpose of obtaining farming credit using the lease as security." (PTT, 2005a)

We also support the PTT proposal for a restocking grant for poorer beneficiaries, "to provide for livestock acquisition over a three year period." (PTT, 2005a)

Affirmative Action Loan Scheme

Under the Affirmative Action Loan Scheme (AALS) implemented by the Agribank, potential buyers from previously disadvantaged communities can obtain subsidised loan finance to purchase a commercial farming unit.

Some major profitability coefficients for the individual farms being surveyed are summarised in the table below. Additionally, results and findings taken from model calculations are presented in the following paragraphs.

Table 0.8: Summary of profitability coefficients for surveyed AALS farms

Land Use System*	Income/ Profit (N$/y)	Area (ha)	N$ per ha	Total lab. income**	Labour units	N$ per LabU	Financial IRR	Economic IRR
AA1 South	26,402	10,403	2.54	52,922	4.5	11,760	2.53%	*(models:*
AA2 South	-125,507	10,282	-12.21	-111,507	2.5	-44,603	-6.27%	*≈ 1.3 to*
AA1 North	90,414	6,172	14.65	155,094	12	12,925		*≈ 20%)*

AA = Affirmative Action Loan Scheme; ** Income/Profit + Wages = Total labour income

The empirical evidence from individual farmers interviewed, together with the modelling and sensitivity analysis, suggests that farming for AALS farmers can only be profitable when stocking rates are high in relation to a farm's carrying capacity, and the farm is managed with high levels of management and technical skills. Even then, farmers in the south may struggle due to the effects of drought on livestock productivity. Farmers' herds are sometimes smaller than they could be due to various factors which include not having the maximum number of stock at the time that the farm is acquired, having to sell animals to generate cash to make the initial 10% deposit in order to acquire the AALS loan and losing substantial numbers of livestock during years of drought.

Over-inflated farm prices also threaten profitability. In most instances, the farm offer price is higher than Agribank's estimated value of the property based on its production potential. Consequently, the buyer may have to pay the difference between the asking price and production value, and in some instances may have to obtain a second loan.

Various factors combine to inflate farm prices. On the one hand, commercial farmers who are selling their farms tend to demand a price well above the production-based value – often because they are planning for

retirement and need to buy a new house and provide a retirement income for themselves. On the other hand, the availability of loans under the AALS has increased the demand for farms and the price that people are prepared to pay.

There are other reasons for loan repayment difficulties as well. Firstly, the Subdivision of Agricultural Land Act No. 70 of 1970 stipulates minimum farm sizes. As a result, an AALS farmer may be required to buy a farm that can support 400 LSU, with an AALS loan that assumes he or she has 400 LSU, when in fact the farmer may only have 150 LSU to begin with. This makes repayment of the loan difficult right from the start. Secondly, we were informed that until recently, Agribank based loan amounts on the value of the farm value plus the government's 35% guarantee. For example, a loan could be taken for some N$2 million instead of N$1.5 million, thereby requiring the farmer to pay more interest on the loan than would otherwise have been the case.

Something like 50% of AALS farmers could default on their loans to Agribank, and some of the Affirmative Action farms are already being auctioned. It may be impossible to operate a farm profitably when it is financed entirely through AALS loans, due to the interest and capital repayments involved. Those AALS farmers who do not default on their Agribank loans may survive due to their ability to subsidise their farms with funds from their other businesses. It would appear that a radical review of the AALS is required.

The government should undertake a major review of the AALS and consider a wide range of options. These could include:

- Regulating farm prices to minimise or eliminate the gap between market prices and production-based farm values.
- Re-examining the current requirement for the owner to contribute 10% to the total property value.
- Permitting two or more people to buy a farm together, with each buyer supplying his/her proportionate share of the livestock.
- Allowing the commercial farmer selling the farm to remain on the farm (and to resolve any associated complications such as ownership issues, rental fees, or divided loyalty of farm labourers).

Conclusions

This analysis has shown that all of the alternative land use options have the potential to generate positive income streams for beneficiaries, thereby contributing to enhanced rural livelihoods. At the same time, however, each land use option also has the potential to place beneficiaries on a downward spiral of poverty and bankruptcy, if beneficiaries are unable to use the resources at their disposal efficiently. Such negative situations are likely to occur when farmers move their herds from communal land to individual farms without improving their production and marketing practices to compensate for the additional costs, when irrigation farmers rely only on grain crops and neglect to grow vegetables and fruits, when resettlement or AALS farmers use only a certain fraction of their land resources instead of utilising the full potential of the land, or when communities utilise their wildlife and wood resources inefficiently due to poor access to markets and consumers or low hunting quotas.

It is essential that beneficiaries have the necessary skills and knowledge to utilise the resources at their disposal as efficiently as possible. Therefore, training is needed for all land use options. Besides the spe-

cific practical knowledge, managerial skills are essential to guide beneficiaries towards becoming responsible decision makers.

Beneficiaries must be market-orientated to optimise their returns in all land use options. This is particularly important for those land use options where livestock production is the most important output. Livestock must be regarded as an economic asset and not (only) as a way to save wealth or gain status. One way to achieve this is to ensure that selection criteria are designed in such a way that market-orientated people are selected – such people are more likely to be found among those without other sources of income. Clear selection criteria, however, presuppose that the aims and objectives of broadening access to land and natural resources are clearly spelled out. More specifically, it must be clear whether welfare or production objectives should be pursued under the different land use options.

It is in this context that the issue of subsidies must be considered. Subsidies will have a positive effect on beneficiaries' capital investment returns. However, it is essential that subsidies are targeted appropriately and do not amount to a grant. This would detract from the beneficiary's sense of ownership and might lead to inefficient use of resources and infrastructure. As far as perceived ownership is concerned, offering subsidised loans is likely to be more advantageous than directly subsidising initial infrastructure and equipment.

In addition, government programmes need to address the beneficiaries' lack of working capital to provide for sustainable and financially viable development of the farms over time (for example, the replacement and/or improvement of equipment and infrastructure, increasing herds).

In presenting an analysis of six different land use options in one report, the temptation is great to compare these options. However, comparative interpretations need to be done with caution since the analysis results are based on many assumptions that need to be considered. Additionally, time and resource constraints did not allow a detailed assessment of important aspects such as external and multiplier effects, distribution of benefits and environmental impacts of different land use options.
Another aspect that needs to be considered when making direct comparisons is that from an economic point of view, the various land use options differ with regard to the opportunity cost of the land: small scale commercial farming units and the Green Scheme utilise land that is presently un- or underutilised; there are few or no economic opportunity costs against the generated value added for the economy. Community forests and communal conservancies are enterprises undertaken *in addition* to existing farming activities. As long as these existing farming activities are not reduced or negatively influenced, there will be no opportunity costs and the additional activities will generate net value added. However, if there should be any negative impact on existing activities, these opportunity costs would reduce the net value added. In the case of resettlement schemes and the AALS, it would be difficult to generate any net value added, since the farms were previously commercial farms and would continue to be commercial farms. Thus, there are opportunity costs for the farms and the net value added will be only the increase, if any, that new farmers generate. It should be clear from the start whether the objectives of the land use option relate to welfare or production, and this in itself makes direct comparisons questionable.

Nonetheless, the study highlighted the fact that most land use systems require considerable managerial skills and technical support to generate optimal returns. Since the land use systems reviewed are supported by three different ministries, an analysis of the services crucial for the success of each of the land use systems would be useful. Such an analysis would also reveal which ministry is best placed for the provision of specific services and would highlight areas in which close inter-ministerial cooperation is required.

1 INTRODUCTION AND OBJECTIVES OF THE STUDY

The Namibian government has formulated several land-based development schemes in order to support policy objectives related to land reform, sustainable use of natural resources and improved land use productivity. Some of these schemes are still at the formulation stage, others have been partially implemented, and some have been in full operation since 1990.

The most prominent land-based development schemes include:

a) Development of small scale commercial farming units b) The Green Scheme	Team 1*: C. Schuh, W. Werner
c) Communal conservancies d) Community forests	Team 2*: J. Grimm, M. Humavindu
e) Resettlement schemes f) Affirmative Action Loan Scheme	Team 3*: C. Conroy, C. Kwala

* Three consultancy teams of 2 consultants were formed.

Development of small scale commercial farming units

Under this new Ministry of Lands and Resettlement programme, communal farmers can obtain access to commercial grazing units in communal areas. It is estimated that some 5 million hectares are available for development into small scale commercial farming units under this scheme. Once developed, allotments will be given to potential farmers who will enter into a lease agreement with the government. Surveying and other preparatory work has commenced in some of the identified areas.

Green Scheme

The Green Scheme is an ambitious undertaking by the Ministry of Agriculture, Water & Forestry to develop the substantial irrigation resources along the country's perennial rivers. Most of the land available along these rivers falls under the communal tenure system. Over the next 15 years, 27 000 hectares are scheduled to be added to the 8 600 ha of existing irrigation land and approximately 1 500 tenants will be given leasehold status of up to 99 years on 9 ha plots. Private commercial investors are to be given leaseholds in these irrigation projects to manage and run the core estate (PPP) over a limited number of years. It will be their responsibility to oversee the initial operation of the scheme, advise smallholders, provide inputs and assist with the marketing of the produce.

Communal conservancies

Communal conservancies enable rural communities to gain control over, and benefit from game and tourism in protected areas. Some 44 conservancies are currently in operation, covering about one third of all communal land.

Community forests

Community forest legislation allows for rural communities to control and manage forest products and other natural resources of the forests in their areas and to benefit financially from their sustainable utilisation.

Resettlement schemes

The programme involves the purchase of commercial farms by the MLR and the subsequent subdivision and redistribution of these farms or allotments to different categories of previously disadvantaged people. The resettlement programme started in 1990 under the management and administration of the MLR. Two approaches exist under this programme:

a) Group resettlement schemes
This group of people belongs to the most disadvantaged category (no livestock, no income, no land) are resettled on a commercial farm. As a vulnerable community, the government supports them with inputs as start-up capital.

b) Individual resettlement schemes
Scale models (economic farm models) developed by agricultural research guide the process of dividing large scale commercial farming units into viable livelihood units (allotments). The units are then allocated to potential farmers. Beneficiaries under this group are those who have income and livestock, but do not have land to practise commercial farming.

Affirmative Action Loan Scheme

Under the Affirmative Action Loan Scheme (AALS) implemented by Agribank, potential buyers from previously disadvantaged communities can obtain subsidised loans to purchase a commercial farming unit.

Basic investment costs have been calculated for most of the schemes described above. However, the production system requires a financial analysis of what the actual benefits would be to a prospective tenant. Without a careful assessment of the economic implications of these initiatives, as well as an analysis of stakeholder preferences, any development and conservation efforts run the risk of failing.

Organisations that would benefit from such information include:

MLR: Land Use Planning & Allocation; Directorate of Resettlement and the Division of Land Boards, Tenure and Advice
MET: Directorate of Environmental Affairs (DEA)
MAWF: Directorate of Planning; Green Scheme Agency

The results are intended to guide the decision making processes related to rural land use planning and agricultural development.

The **objectives** of the study are to:

1) Review different land use schemes by conducting detailed economic analyses of land use options prescribed under the various schemes.
2) Understand the factors contributing to the sustainability of different land use schemes, given development policies, tenure rights and income generating patterns.
3) Prepare a more in-depth financial and economic analysis for selected schemes.
4) Recommend how to make land use options economically viable, taking environmental, social and technical matters into account.

The tasks to be carried out were formulated as follows:

1) Describe the range of land use possibilities pursued under each scheme and identify typical, representative, real case models for analysis and extrapolation within this range.
2) Describe the positive and negative impacts of each land use scheme and the factors contributing to sustainability (including policies, government support, tenure rights and livelihood patterns).
3) Assemble and review existing financial and economic data and publications, and summarise the information available on each land use scheme/model.
4) Identify data gaps for the analysis of each model to establish:
   - benefits and costs in different land uses for selected time periods
   - financial profitability measures (net income/profit, financial rates of return, net present values) for single users as well as for entire scheme/conservancy
   - economic viability (annual contribution to the national income, economic rate of return, net present value)
   - socio-economic impact on the community
   - factors contributing to differences between "pure" models and existing schemes.
5) Collect data required (through expert interviews and household surveys among beneficiary groups).
6) Assess the financial and economic viability of each model and by means of sensitivity analysis, identify key enterprise characteristics, risks and factors that could help to increase viability.
7) Present the results to key stakeholders.

The consultants worked under the supervision of a steering committee with representatives of the following institutions: MAWF, MLR, MET, RPRP Project, Green Scheme Agency, NNFU, NAU and GTZ.

The **time frame** for the study can be outlined as follows:
The consultancy (joint mission of all teams) in Namibia was carried out between 18 September and 13 November 2006, excluding some additional time for reporting and presentation of the results.

18 and 19 September	Initial discussions and preparation
20 September	Start-up workshop with consultants and steering committee
21 September to 9 October	Interviews and field visits
10 October to 13 October	Analytical workshop – discussion and coordination with other teams including presentation of preliminary results to the steering committee (11 October)
16 October to 31 October	Preparation of report (in Germany and Namibia)
15 November	Presentation and discussion of results, handing over of the reports (only by Namibian consultants)

A detailed work programme of all activities carried out in Namibia is attached in Annexure 1 (on the CD) along with the terms of reference.

2 METHODOLOGY AND OPERATIONAL STUDY SONCEPT

As outlined in the terms of reference (Annexure 1) the particular activities carried out by the consultants comprised:

a) Collection of required data through expert interviews and focus group surveys among beneficiaries.

(b) Development and updating of financial and economic models of the selected land reform options/land use systems.

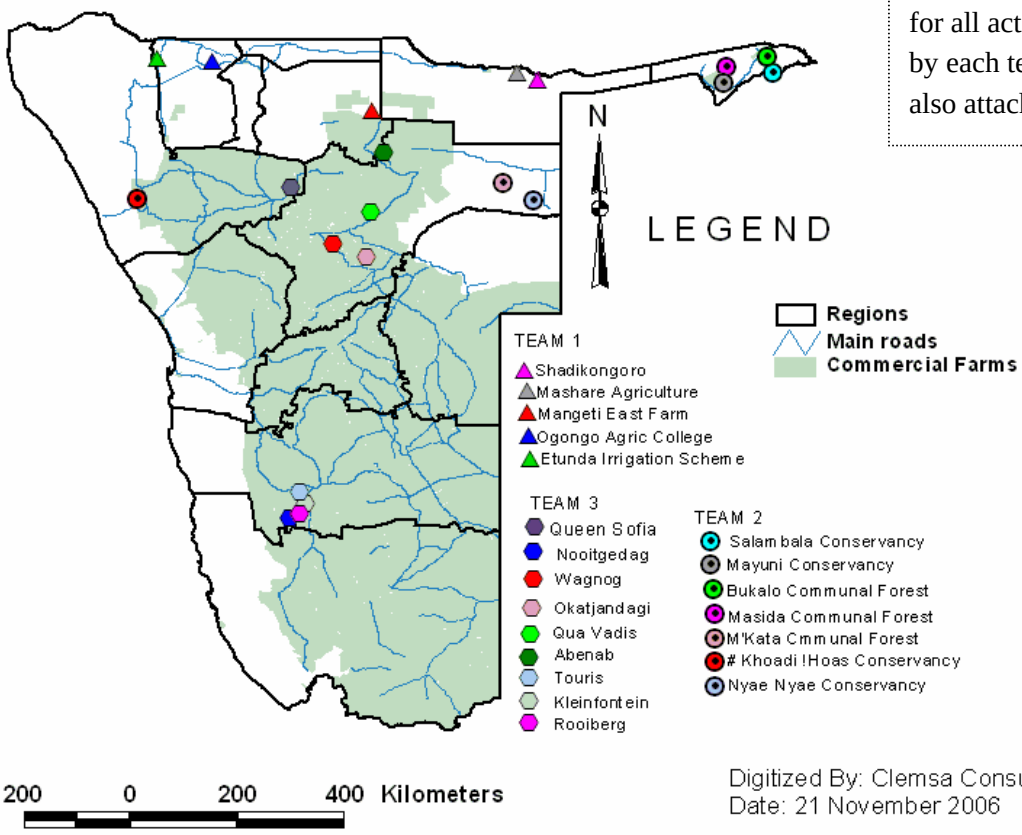
(c) Assessment of financial and economic viability including sensitivity analyses, and identification of key enterprise characteristics, risks and factors that could enhance viability and economic efficiency.

2.1 Data collection

Interviews with beneficiaries and focus group surveys to collect data were carried out by consultants between 21 September and 9 October.

The consultants selected the sites to be visited with support of the steering committee. Some of Team 3's cases were selected randomly; for the other teams, random sampling was not applicable as only a few cases existed – either they were all visited, or specific sites were selected because of their particular characteristics. The map below indicates all sites visited.

Figure 2.1: Field visit sites of the three consultancy teams



A detailed work programme for all activities carried out by each team in Namibia is also attached in Annexure 1.

2.2 Development of financial and economic models

The data collected during the field visits and expert interviews was used to develop and update models used to assess the financial and economic viability of various land reform options and land use systems.

For the analysis of small scale commercial farming, the Green Scheme, resettlement farms and AALS farms, gross margin calculations for the major farm enterprises were calculated. On this basis, static whole-farm budgets were developed for profit and income assessment. For the communal conservancies (and partly for the community forests), similar static whole-enterprise budgets were elaborated. Based on these static calculations, dynamic models have been prepared to determine the financial rate of return and for the detailed analysis of various financing options. Again, these financial tables served as a basis for the final (dynamic) economic models that have been developed for the analysis of the economic rates of return and the economic net present values of the projects.

Data relating to the communal conservancies was updated with the information obtained from the field visits, but in all other cases new models had to be developed.

All models are attached in the various annexures on the CD as computer files, so that they can be opened and used for further modelling and altering

.

2.2 Assessment of financial and economic viability

Shadow pricing was applied for the economic cost benefit analysis, aimed at ensuring that values applied to inputs and outputs reflected their opportunity cost or real scarcity in society (rather than simply market prices). The shadow pricing criteria were based on those developed within Namibia by Barnes (1994, see Annexure 2).

The adjustments were limited to the following. A real discount rate of 8% was used for both financial and economic models (land opportunity costs were excluded to allow direct comparison between model results regarding returns to land). All capital expenditure was included and depreciation (or appreciation) was accounted for in the residual value of assets in the final year of analysis. A general shadow price for unskilled and semi-skilled labour of 0.35 of the market price (conservancies) and 0.2 (farming) respectively was applied in the economic models to reflect general unemployment and social pressure for higher wages. A foreign exchange premium of 6% was added to the prices of all tradable items in the economic models to account for general excess demand for traded and tradable goods and services. In the economic models, inflows from and outflows to non-nationals were treated as benefits and costs, respectively. This ensured measurement of national income.

For the conservancies, the economic models did not include national expenditure by central government in the wildlife or agricultural sectors. Also excluded were benefits accruing to private joint-venture partners in a conservancy, or to service providers or producers outside a conservancy. Cost of damage caused by wildlife was included, mainly through inclusion of the costs of mitigating damage. Mitigation costs are used as proxy for damage costs, and thus represent damage costs averted.

Domestic transfers such as taxes and subsidies were eliminated as costs or benefits. Taxes included VAT, license and permit fees. Subsidies included those from government infrastructure for live game stocking and interest subsidies. All conservancies benefited from grants provided by donors from outside the coun-

try to assist with capital and recurrent inputs. These grants, however, were considered convertible to other applications outside conservancies within Namibia, and therefore were deemed to have opportunity costs. In the economic analysis they were treated as costs rather than as subsidies.

3 ANALYSIS OF SMALL SCALE COMMERCIAL FARMING UNITS

By
Christian Schuh
Wolfgang Werner

3.1 Background

3.1.1 Objectives of the programme

The development of unutilised land in non-freehold or communal areas forms an important component of Namibia's land reform programme. The National Land Policy commits government to this process "where this is environmentally sustainable". In 2000, the Ministry of Lands and Resettlement appointed consultants *inter alia* to identify "virgin, unutilised and underutilised lands and make proposals and recommendations on the sustainable utilisation of the categories of lands and natural resources found thereon". The consultants were also required "to propose different and suitable ways to develop the communal areas. This included different types of land uses, the survey and demarcation, fencing of certain plots where necessary and their minimum sizes". Approximately 5,5 million hectares of un- or underutilised land were identified in all communal areas of Namibia by the consultants, who recommended that this land be demarcated into farms ranging between 3 600 ha and 4 000 ha in size to be allocated to small scale commercial farmers. The MLR has revised these recommendations and has surveyed farms of 2 000 ha in the Caprivi and 2 500 ha in Okavango Region. It anticipates that beneficiaries of this programme will be commercial farmers in their own right.

The objectives of the establishment of small scale commercial farms on communal land are complimentary to the wider objectives of land reform in Namibia. These objectives were summarised by the Permanent Technical Team on Land Reform in the following way:

- To bring about a more equitable distribution of and access to land;
- To promote sustainable economic growth;
- To lower income inequalities; and
- To reduce poverty.

Government hopes that the development of formerly neglected communal areas will lead to an improvement of the living conditions of communities living in those areas and ultimately a reduction in poverty levels. Commercial farming methods would have to be introduced in communal areas in order to improve the output of farming activities (Republic of Namibia 2000: 19-20).

Consistent with the desire to increase agricultural output in communal areas in a sustainable manner, the MLR accepted the recommendation by IDC (2000) that the introduction of small scale commercial farming practices within the guidelines of the Communal Land Reform Act, 2003 would be one of two ways in which the agricultural potential of communal lands could be unlocked. The other way was controlled common grazing. The consultants used the term "commercial" to refer to a process whereby land would be allocated to individual farmers.

Apart from concerns about increasing agricultural output, the MLR also stated that the development of un- and underutilised land by developing additional water points would help to ease overgrazing on communal land, where communities were concentrated around existing boreholes (MLRR 2002).

Progress has been made in surveying communal land. Over 500 farm units have been surveyed in the Caprivi (82 farms), Kavango Region (457 farms) and Ohangwena Region (24 farms). Traditional leaders in Oshana could not be persuaded to release land for the development of small scale farming, while their counterparts in Oshikoto Region felt that large areas were fenced already and that developing additional land for small scale farming was not desirable. Instead, discussions are underway between MLR and the traditional authority to demarcate fenced land units properly. Consultations in Omusati Region with regard to the development of small scale farming units proved difficult and have not been concluded. Indications are that the traditional authority will not be in favour of developing the entire area recommended by IDC. In the Sambiyu area of the Kavango Region, 76 farms have been allocated upon the recommendation of the *hompa*. But allocation has been stopped in anticipation of revised selection criteria.

3.1.2 Guiding policies and strategies

The development of unutilised land in the non-freehold sector is guided by a comprehensive policy and legal framework. At the apex, Vision 2030 provides the overarching vision for Namibia's development trajectory, which envisages a prosperous and industrialised country by 2030. Poverty will be reduced and the distribution of income more equal. In the short- to medium-term, equitable access to land and natural resources and the sustainable utilisation thereof will contribute to achieving the vision.

National development plans provide guidance for medium-term development strategies and objectives. NDP 2 is coming to an end and preparations for the third national development plan covering the period 2006 to 2011 are underway. The development objectives of NDP 2 included the reduction of poverty and the creation of employment; the reduction of inequalities in income distribution and regional inequalities and to stimulate and sustain economic growth.

In 1998, the Poverty Reduction Strategy (PRS) was approved by Cabinet. It focused on three main areas:

- How to foster more equitable and efficient delivery of public services (in the context of Namibia's commitment to regional decentralisation) for poverty reduction countrywide;
- How to accelerate equitable agricultural expansion, including consideration of food security and other crop development options; and
- Options for non-agricultural economic empowerment, including an emphasis on the informal sector and self-employment options.

It emphasised the need for a public-private partnership in developing income generation and safety net initiatives. In this context, the PRS referred to the need to improve livelihoods in the agricultural sector. Despite the obvious limitations of the sector, the PRS recommended that the livestock sector be further developed.

Namibia is a signatory to the Millennium Declaration and is monitoring the Millennium Development Goals (MDGs) within its national and sectoral development framework. Access to land through Namibia's land reform programmes has been identified as a means to achieve MDG 1: the eradication of poverty and hunger.

In addition to cross-cutting policies and visions, a comprehensive sectoral policy and legal framework guides the development of non-freehold land. The National Land Policy (NLP) stipulates that the administration of communal land vests in traditional authorities and land boards. Land boards will be responsible for the zoning of communal land for "national and community development" and will determine the amount of land that may be made available for leasehold. The NLP provides for the introduction of long-term leases of 99-year duration to provide the security required for business purposes. These leases will be registered and can be transferred, inherited and renewed. They are also expected to serve as collateral for credit.

The Communal Land Reform Act of 2003 (CLRA) provides the legal framework for the National Land Policy. It provides for the designation of parts of communal areas as agricultural development areas. Once designated, the land will be excised from the jurisdiction of traditional authorities. Communal land boards (CLB) may grant rights of leasehold for agricultural purposes to individuals. The process requires the minister to consult with affected traditional authorities, and leasehold may only be granted once traditional authorities have consented. However, the minister may also grant a right of leasehold in respect of land that falls outside a designated area if he or she is satisfied that such leasehold will not interfere with or curtail the use of commonage by members of the community. A right of leasehold may not be granted in respect of a portion of land over which another person holds customary land rights, unless the person is prepared to relinquish his or her rights. In such an instance, appropriate compensation and suitable arrangements for his or her resettlement on alternative land must be agreed upon.

The registrar of deeds has not yet registered any lease agreements in respect of land allocated in the freehold sector to small scale farmers under the land reform programme, as no agreement has yet been reached on the form of the lease agreements. At the time of writing, consultations were ongoing between various stakeholders, including financial institutions, on the drafting of standard leases for various categories of land use. A major concern of financial institutions appears to be that the land will continue to belong to the government and thus cannot be sold in the case of defaulters.

The National Resettlement Policy (NRP) lays down criteria for the selection of land reform beneficiaries. Previously disadvantaged Namibians owning less than 150 LSU, or the small stock equivalent, qualify for resettlement. Information obtained in the MLR suggests that the criteria set out in the National Resettlement Policy will be applied in selecting small scale commercial farmers. This means that all previously disadvantaged Namibians who qualify for resettlement by dint of the fact that they own less than 150 LSU may apply. It is also expected that applicants for small scale commercial farms must have the ability to farm commercially. In considering applications, the MLR will pay attention to previous experience in stock farming, current farming activities, the financial capacity of the individual as well as his or her management capacity (MLRR [2002]). CLBs in consultation with traditional authorities will make allocations.

The selection criteria provided in the NRP are very wide, making targeting of beneficiaries difficult. Cabinet therefore decided in May 2006 that beneficiary screening and selection be improved. In order to achieve this, the government was called upon by Cabinet to determine whether existing criteria for beneficiary selection continue to be socially, economically and politically appropriate. At the time of writing, this process was underway.

The National Agricultural Policy (NAP) also provides policy support for the development of small scale commercial farms. It has identified farming in the non-freehold or communal sector as offering the greatest potential for growth and diversification. Government will therefore encourage communal and commercial farmers to increase land productivity and put idle and under-utilised land to more productive use. In

this regard, idle and underutilised land controlled by government will be prioritised for development and (re)settlement. The NAP accepts that smallholder farming is the means by which the benefits of agriculture can be shared amongst the largest numbers of people in an equitable and sustainable manner.

3.1.3 Implementing agencies

3.1.3.1 Provision of financial support

Two scenarios have been developed by the MLR to finance the development of small scale commercial farms in non-freehold areas. Scenario 1 is based on the assumption that government will be responsible for all development costs. These costs will be based on actual prices of material and equipment and will include the cost of planning, surveying, ground water investigation and the drilling and equipping of one borehole as well as erecting a perimeter fence and internal fencing for four camps. The capital outlay is expected to be recouped by annual rental fees. The rentals to be paid annually for farms that were fully developed by the MLR have not been determined yet.

In Scenario 2, government will bear the costs of planning, surveying and water provision only. Fencing will be carried out at the expense of the beneficiary (MLR n.d.).

The pace of developing surveyed farms is being delayed by financial constraints experienced by the MLR. As a result, some programme beneficiaries have invested their own capital to develop their allocated farms. This will be reflected in annual rentals which will be lower than those for farms where the MLR bore all or part of the costs. At present, farmers who develop surveyed land using their own capital are expected to pay approximately N$9 000 per annum for a 2 500 ha farm.

3.1.3.2 Provision of technical support

The MLR and MAWF will be the main ministries to provide technical support for the development of small scale commercial farms similar to the support provided in the farm unit resettlement programme. The Department of Water Affairs (MAWF) currently provides support for sitting boreholes, preparing and evaluating tenders for drilling and borehole installation, as well as monitoring borehole development. The MLR provides the budget for this process. Farms are surveyed and fenced by private companies appointed and paid by the MLR.

3.1.4 Institutional environment

The MLR bears the main responsibility and mandate for the identification and development of small scale farming units in communal areas. It is responsible for the conceptualisation and implementation of the land reform programme as well as land management issues. Its primary role is to facilitate the effective allocation of land and the creation of conditions for optimal agricultural production, food security, affordable shelter, sound habitat and strategic sectoral linkages (MLR 2005).

Some land administration functions have been decentralised to communal land boards. In terms of the CLRA, land boards have been established in 12 out of 13 communal areas. Their functions include the approval of applications for leasehold in communal areas. However, CLBs can only approve applications for customary and leasehold rights up to 20 ha and 50 ha respectively. Applications exceeding the prescribed sizes must be forwarded to the Minister of Lands and Resettlement for approval. The same applies to applications for lease agreements that exceed 10 years. In addition, applications for lease agreements

can only be approved by CLBs if the traditional authority within whose area of jurisdiction such an application falls, has consented to the application.

Traditional authorities will continue to play an important role in the administration of communal land. Their consent is required for the approval of lease agreements and the designation of communal land for agricultural production or other economic activities.

Regional councils are not directly involved with the identification and development of small scale commercial farms in non-freehold areas. Planning and budgeting for the development of farms is done by the MLR. Regional councils are informed about his through the regional development coordinating committees, on which the MLR is represented. It must be anticipated, however, that regional councils will compete for a slice of the revenues generated through lease agreements, in view of the fact that they are expected to be financially self-supporting. The Trust Fund for Regional Development and Equity Provisions Act of 2000 provides for the establishment of a trust fund for regional development and equity provisions. This provides a mechanism for receiving funds in order to pay, among other things, for the identification, planning, preparation, implementation and monitoring of development projects.

A similar situation applies to traditional authorities. The Traditional Authorities Act of 1995 provides for the establishment of community trust funds by traditional authorities on behalf of their respective communities. The general purpose of such funds is to contribute towards the costs of running the offices of traditional authorities and carrying out the responsibilities stipulated in the Traditional Authorities Act of 1995. More specifically, these responsibilities include cooperation with regional councils and other government structures to implement government policies and programmes and to “keep members of the traditional community informed of developmental projects in their area” (Traditional Authorities Act of 1995: 8; 11).

At the same time, the CLRA stipulates that rentals be paid into the central Communal Land Reform Fund. A formula will be developed to guide the sharing of monies in that fund between regions, and it must be expected that various levels of regional and sub-regional government will compete fiercely for a portion of this fund. It is imperative that regional councils and traditional authorities be closely involved in determining such a formula so as not to alienate them from the development of communal land for extensive grazing purposes.

Other ministries that will be actively involved in the programme are the MAWF, the Ministry of Works, Transport and Communication (MWTC), the Ministry of Health and Social Services (MOHSS) and the Ministry of Regional and Local Government and Housing and Rural Development (MRLGHRD). Consultations with the MWTC and MOHSS with regard to the construction of roads and health facilities have not been finalised.

Identification of clear roles and responsibilities of line ministries in supporting the development of small scale farms and resettlement remains a challenge for the MLR, as it has no mandate to compel other ministries to fulfil their roles (PTT 2004). In order to improve coordination, Cabinet decided in May 2006 that the Cabinet Committee on Lands and Social Issues should coordinate activities on land reform generally, and that a technical committee on lands and social issues should be assigned to advise and facilitate the implementation of the approved Action Plan on Land Reform.

3.1.5 Selection and characteristics of sites

The initial demarcation of virgin and/or un- and under-utilised land was done by identifying areas with population densities of less than 2 people per km^2 (IDC 2000: 2). The official Population Census of 1991 was used as a basis from which to work. The initial identification was subsequently refined by taking the following into account:

- Agro-ecological zones;
- Status of rangeland conditions at the end of rainy seasons;
- Availability of infrastructure such as water supply (by pipelines or boreholes), roads, etc.;
- Current economic activities such as farming, mining, tourism and forestry; and
- Social infrastructure, such as school, clinics, settlements, etc.

In Kavango Region, traditional authorities have already earmarked land for commercial development. The final selection of sites for farm development will depend on the availability of water and borehole-drilling progress.

Land identified for potential small scale farming in the northern and north-eastern communal areas is located north of the Veterinary Cordon Fence. This introduces limitations on the marketing of livestock and meat at markets south of the VCF. All livestock destined for slaughter at Meatco abattoirs must be quarantined for a period of three weeks in quarantine camps. The following quarantine facilities are available in those regions (Vigne 2005a):

- Oshivello (Oshikoto Region): 13 000 ha, 190 km to export abattoir
- Omatumbo Maue (Oshana Region and adjacent to the north-western corner of Etosha National Park: 25 000 ha, 345 km to export abattoir
- Khowarib (Kunene Region): 5 000 ha
- Oatjakati (Kunene Region): 359 to export abattoir in Oshakati
- Ehomba (Kunene)
- Okongo (Ohangwena Region): 30 000 ha, 280 km to export abattoir
- NDC (Kavango Mangetti): 18 000 ha, 420 km to export abattoir
- Thomas Shiyaye (Kavango Region): 420 km to Katima Mulilo and 640 km to Oshakati export abattoir
- Matumbo Ribebe (Kavango Region): 584 km to Oshakati export abattoir
- Kopnao (Caprivi Region): 50 km to export abattoir
- Katima Mulilo (Caprivi Region): 20 km to export abattoir

In order to minimise the negative impact of the VCF on livestock marketing, IDC recommended that the development of SSCF should start in areas close to the commercial farming areas and be gradually expanded northwards. This would facilitate more rapid inclusion of SSCF in the unrestricted marketing areas (IDC 2000: 37).

The carrying capacity of rangeland in the northern and eastern communal areas improves gradually from west to east as rainfall increases. Based on the latest scientific estimations which assumed a large stock unit to have 450 kg live weight and to require 4 metric tons of dry feed per year, carrying capacities were estimated as follows for these regions:

- Kunene: 20 to 25 ha/LSU
- Oshikoto, Oshana, Ohangwena and Omusati regions:15 to 20 ha/LSU
- Kavango: 15ha/LSU
- Caprivi: 5 to 10 ha/LSU[1]

These carrying capacities were considered likely to support sustainable stocking rates on well-managed rangeland (IDC 2000: 26). Where indigenous livestock breeds are replaced with other breeds with higher live weights and a higher dependency on grass than the indigenous Sanga breed for example, stocking rates will have to be adjusted upwards.

3.1.6 Existing financial and economic data and publications

Small scale commercial farming units are still being surveyed and allocated and so financial and economic data for farm enterprises is unavailable. In 1998, the Land Reform Advisory Commission requested Agribank to develop scale models for farming units. The aim of the study was to determine the minimum extent of farmland required to conduct viable enterprises for small scale farming. These models were developed for large and small stock farming. Based on different farm sizes, Agribank developed detailed infrastructure costs, calculated cash flow projections, production costs and profits.

IDC has produced development cost estimates for farms ranging between 3 600 ha and 4 000 ha, but no cost benefit analysis. A broad economic analysis of different land reform models was undertaken by GFA *terra systems* in 2003.

3.2 Financial analysis

[The models developed for the financial (and economic) analysis are attached in Annexure 3. All calculation files (Excel files) can be found on the accompanying CD. They are designed to allow further modelling and altering by the interested user.]

3.2.1 Investment costs

Long-term investment costs for a surveyed and demarcated livestock farm comprise mainly the items listed below (Table 3.1). The figures shown represent a unit of 1 000 ha. This unit size was chosen for the models because it represents one quarter of a 4 000 ha farm – the smallest unit size to be discussed thus far. By implication, the borehole (pump, engine, etc included) is assumed to be shared between four farmers, as are parts of the fences shared between neighbours.

Table 3.1: Investment costs for a livestock farm per 1 000 ha

	Quantity		Price	Total	Lifespan	Depric.	Maint.
			N$	N$	years	N$/y	N$/y
Fences (border) (shared)	8.47	km	8,000	67,799	30	2,260	4,200
Fences (internal)	6.32	km	8,000	50,596	30	1,687	3,040

[1] In Annexure 3 (on the CD) are two maps which display the area distribution of the carrying capacity of the rangeland in Namibia. The coefficients from the maps tend to be more positive than the figures shown on this page.

Crush pen, etc.	1.00	10,000	10,000	10	1,000	100
Reservoirs, pipes, troughs	1.00	10,000	10,000	20	500	100
Pump and engine (shared)	0.25	16,000	4,000	15	267	200
Borehole (shared)	0.25	75,000	18,750	20	938	380
Simple housing for labourers	2	1,000	2,000	5	400	40
Total			163,146		7,051	8,060

Source: Own calculations

A sensitivity analysis in sub-paragraph 3.2.2 shows the effects of development cost variations given that different unit sizes are under discussion, development costs vary, and the costs of drilling boreholes and purchasing fencing have increased in price recently,. However, it has to be kept in mind that increasing unit size has both positive and negative effects on the costs per hectare. While the fencing costs per hectare tend to decrease slightly (a decrease of approximately 10% when size is doubled), the borehole costs may increase if, for example, a 2 000 ha unit already has its own borehole.

The information shown in the table above was collected during interviews with farmers in the Kavango and Ovambo Mangetti Scheme and checked against available data from the relevant ministries. The total amount is more than the MLR spends on the development of a 4 000 ha farm and subdivision into four units of 1 000 ha (compare with 3.2.3 below) because internal fencing within the 1 000 ha sub-units, crush pen and housing is not provided by the MLR.

However, depending on the carrying capacity of the rangeland, another major investment for the farmer is the investment in livestock. Regardless of whether the livestock is obtained by purchase, exchange or taking over an existing owned herd, the capital requirements per 1 000 ha for the productive cows (and bulls) amount to:

a) Approximately N$130 000 for approximately 51 cows and 2 bulls, assuming 10 ha/LSU.
b) Approximately N$90 000 for approximately 34 cows and 2 bulls, assuming 15 ha/LSU.

The capital requirements for a complete herd with young stock may be twice these amounts.

Since in practise there are different start-up options, these variants have been evaluated in more detail in a dynamic analysis. For the static analysis, the full capital requirements for a complete herd (with young stock) were used.

3.2.2 Financial viability

For the financial analysis (and for the subsequent economic analysis), interviews were held with farmers in the Kavango Region and the Ovambo Mangetti Scheme and discussions were held with extension staff. Three production levels with different input and output relationships were determined, which resulted in three different gross margins. The three production levels can be described as follows:

Low — These farmers are farming in a similar low-input way similar to the way they farmed previously in the communal areas. The input level is low and so is the output. Due to better feeding, breeding (availability of bulls) and health care conditions, the productivity in terms of calves born per cow per year is slightly higher than in the communal areas, but remains very low (0.5). Male offspring are kept a long time (four years, or even longer) until they are sold

(usually when money is needed for exceptional expenses) and so the prices obtained are very low.

Medium Most of the Mangetti farmers interviewed fell within this category. Due to supplementary feeding and health care measures, these farmers achieve a calving rate of about 60% (on average 0.6 calves per cow per year).However, supplementary feeding and health care measures are still below recommended levels. Male offspring are sold sooner than in the low production category, but are still too old to reach higher prices.

High This category represents a hypothetical "imagine-if" scenario as none of the Mangetti farmers interviewed fell within this category. It demonstrates the potential effects of improved productivity and demand-orientated marketing. The assumptions are based on the recommendations for supplementary feeding and health care measures, and on information collected during an informal discussion with a commercial farmer (outside Mangetti). The calving rate is assumed to be 70% and the selling age of male offspring is only 18 months which leads to higher meat prices (better grade).

For comparative purposes, a fourth model was developed assuming the production conditions in the communal areas. Since no interviews were conducted specifically for this model, the data was derived from responses obtained from the Mangetti farmers when they were asked for the major differences between individual and communal farming.

The major differences between the production levels can be summarised as follows:

Table 3.2: Input-output coefficients used for the analysis of commercial cattle farming

	Calving	Fattening of male offspring			Suppl. feed.	Health care
Scenario	Rate	months	fin. Weight (kg)	price / kg	kg/LSU/day	(factor*)
Communal	0.4	60	525	14	0.05	0.5
Low	0.5	54	490	14	0.07	0.6
Medium	0.6	48	460	14	0.1	0.8
High	0.7	24	330	20	0.15	1

Source: own calculations *) 1 = recommended level

Two major factors that would have a positive effect on profitability are an improved calving rate and a shorter fattening period for the male offspring. Whilst the link between increasing the number of calves born and thus the gross margin is obvious, reducing fattening periods of the male offspring (thus leading to lower marketing weights) at first glance seems to be counter-productive.

However, in addition to obtaining higher meat prices, shorter fattening periods lead to a lower average number of males kept, meaning that fewer animals need to be fed and maintained on the same land. Grassland that is not needed for older males thus becomes available for productive females. The herd is increased and therefore total production increases. The precise financial effects of improved marketing will be discussed later under 3.2.4 where a short calculation further illustrates this point.

The results presented in the following paragraphs are based on different carrying capacity conditions for the grassland of 1:10 (1 LSU per 10 ha) as in the Caprivi and northern Kavango, and 1:15 (1 LSU per 15 ha), as in the southern Kavango (1 LSU being equivalent to 450 kg of live weight, or 1 cow). Addition-

ally, sensitivity analyses have been carried out in order to assess the effects of the different natural conditions.

Static analysis

Gross margins (the financial results before deducting fixed costs) for the different production levels have been calculated as the basis of all further analyses. The results are summarised in the table below.

Gross margins for low and medium levels were very low – mainly due to very low prices being received for meat sold. Prices were low due to the animals' old age and suboptimal fat conditions at the time of marketing. The potential benefits of a different marketing strategy are represented by the "high" level and discussed later under *Sensitivity analyses* (in this chapter) and *Marketing* (3.2.4).

Table 3.3: Gross margins for cattle

Unit: 1 cow incl. offspring per year		Communal	Low	Medium	High
Meat production (offspring)	N$/y	830	973	1,102	1,315
Meat from old cows	N$/y	439	439	439	439
Value of produced heifers	N$/y	401	502	602	702
Total gross output	N$/y	1,670	1,913	2,142	2,456
Average replacement costs	N$/y	400	400	400	400
Feedstuffs costs	N$/y	77	113	166	208
Vet, health care costs	N$/y	122	154	211	222
Fuel (water supply)	N$/y	0	36	37	31
Other variable costs	N$/y	98	118	134	148
Total variable costs	N$/y	697	820	949	1,009
Gross Margin	**N$/y**	**973**	**1,093**	**1,194**	**1,446**

Source: Own calculations

The gross margin offers the first indication of the contribution to the consumable household income where no employed labour or loans are involved, since the fixed costs then refer mainly to the depreciation of fixed assets (see Table 3.1) which (a) can be consumed when money is scarce and (b) refer to investments financed by the MLR in case of subsidised farms.

However, to secure long-term sustainable farm development, the fixed assets must be maintained and money must be saved to replace them when necessary. If loans are involved, depreciation might also be used for the capital repayments, and interest must be paid. Thus, the profit of farming, demonstrated in the table below and which accounts for the depreciation for *all* development costs, is a far better measure of the average annual income for a farming household. By comparison, the last line in the table below shows the profit of farming *excluding* depreciation, since one may argue that if the farm development is subsidised by the MLR, the farmer does not pay for the fixed assets. However, rent still has to be paid (an annual amount of N$5 000) and the MLR cannot reasonably be expected to fully maintain and replace all fixed assets and so depreciation and maintenance of fixed assets must taken into account.

For this exercise, it was assumed that 60% of the fixed assets were financed by a loan (considering that with time, the farmer would replace some of the fixed assets using his or her own capital). In the case of a subsidised farm, interest payments would be lower, but by then these would be off-set by payment of the full rent for the land (N$5 000 per year). Wages are based on the assumption that two full-time labourers

would be employed at N$6 000 per person per year. If family labour is used exclusively, the wages paid could be added to the profit of farming as a contribution to the consumable household income. If labourers are employed, the profit of farming represents the farm owner's annual contribution to the consumable household income. Only where debts repayments exceed farm depreciation would these higher repayments to the bank further reduce the consumable household income. For a more detailed analysis of the effects of financing, please refer to the results of the dynamic analysis below.

Table. 3.4: Average annual profit of farming for cattle per 1 000 ha (various production levels)

		Carrying Capacity: 15 ha/LSU				Carrying Capacity: 10 ha/LSU			
		Commun.	Low	Medium	High	Commun.	Low	Medium	High
Total gross output	N$/cow y	1,670	1,913	2,142	2,456	1,670	1,913	2,142	2,456
Total variable costs	N$/cow y	697	820	949	1,009	697	820	949	1,009
Gross Margin	**N$/cow y**	**973**	**1,093**	**1,194**	**1,446**	**973**	**1,093**	**1,194**	**1,446**
Number of cows kept*)	(Ø/y)	36.41	34.76	33.77	40.33	54.61	52.14	50.65	60.50
Total Gross Margin of herd	**N$/y**	**35,431**	**38,005**	**40,312**	**58,336**	**53,146**	**57,007**	**60,469**	**87,504**
- Depreciation for fixed assets	N$/y	0	7,051	7,051	7,051	0	7,051	7,051	7,051
- Maintenance of fixed assets	N$/y	0	8,060	8,060	8,060	0	8,060	8,060	8,060
- Wages paid	N$/y	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000
- Interest paid	N$/y	0	3,915	3,915	3,915	0	3,915	3,915	3,915
- Rent paid	N$/y	0	3,600	3,600	3,600	0	3,600	3,600	3,600
= Profit of farming	**N$/y**	**23,431**	**3,378**	**5,686**	**23,709**	**41,146**	**22,381**	**25,843**	**52,877**
= Profit excl. deprec. **)	N$/y	23,431	9,029	11,337	29,360	41,146	28,031	31,493	58,528

*) Number of cows kept differs according to fattening period of the male offspring and the calving rate;
**) Depreciation added to PoF; Rent N$ 5000 instead of N$ 3600 per year
Source: Own calculations

The perceived profit of farming illustrates one of the major concerns that a farmer considering moving his or her existing herd from communal areas to an owned individual farm may have: a significant drop of income due to new equipment costs. Only by changing farming practices (input, productivity and marketing) in accordance with the "high productivity model" could the farmer generate sufficient income to absorb the increased costs.

Additionally, under favourable natural conditions (10 ha per LSU), a 1 000 ha unit may be large enough to provide a adequate household income. However, much larger farm sizes would be required for areas with lower carrying capacity. For a more detailed discussion of farm sizes see sub-paragraph 3.4.

In addition to the static calculations, questions regarding different financing options and start-up conditions are evaluated in the dynamic analysis below.

Dynamic analysis

In contrast to the static analysis above, with a dynamic model, different financing options and changes as the farm develops over time can be evaluated more accurately. For the dynamic analysis, three basic scenarios were developed in order to allow a differentiated analysis. The scenarios can be described as follows:

Scenario 1: *Flying start with purchased animals*

The farmer buys all cows right at the beginning.

In this scenario, the costs for the required animals are based on market prices.

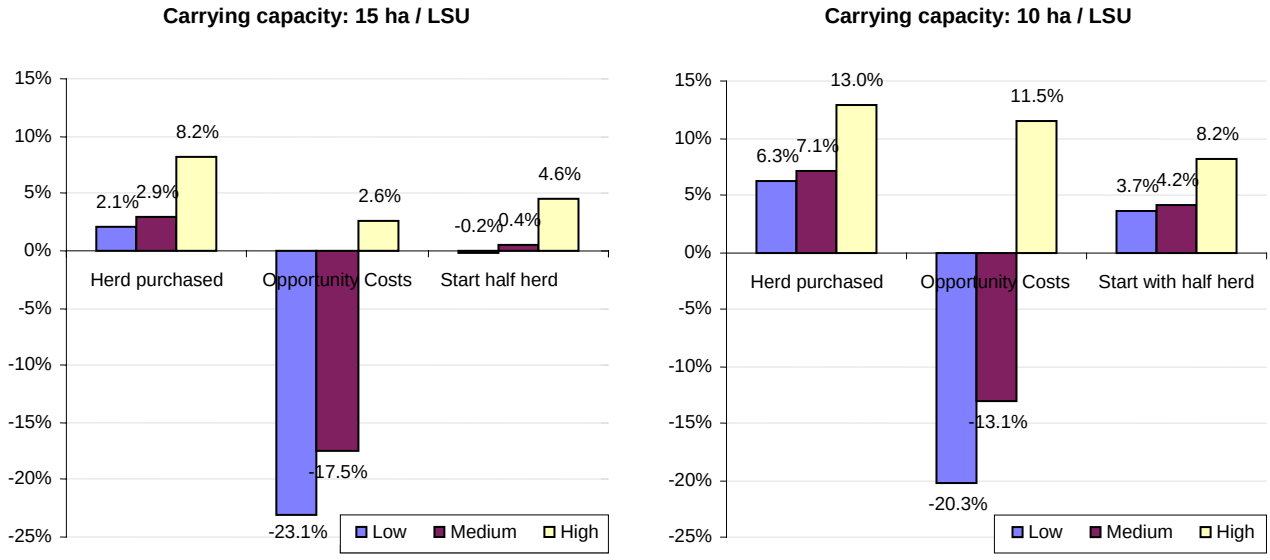
Scenario 2: *Flying start with own animals with opportunity costs*
The farmer already has a herd in the communal areas and takes all of these animals to his farm. This creates opportunity costs which are used to determine the costs for the required animals.

Scenario 3: *Start with half the herd (purchased animals)*
The farmer starts farming with approximately half of the number of cows that could be kept (15 ha/LSU: 20 cows; 10 ha LSU: 30 cows) and increases the herd over a period of 10 years. Again, the costs for the required animals are based on market prices

Each of the three scenarios was evaluated in combination with each of the three production levels discussed above, so that nine different alternatives have been elaborated.

The diagram below displays the internal rate of return based on the total capital invested for each of the nine alternatives. The hurdle interest rate chosen (as a yardstick) is 8%, which represents the real interest costs for capital derived from the nominal interest rate of 10% to 12% for long-term Agribank loans .

Figure 3.1: Internal rate of return for total capital invested



Source: Own calculations

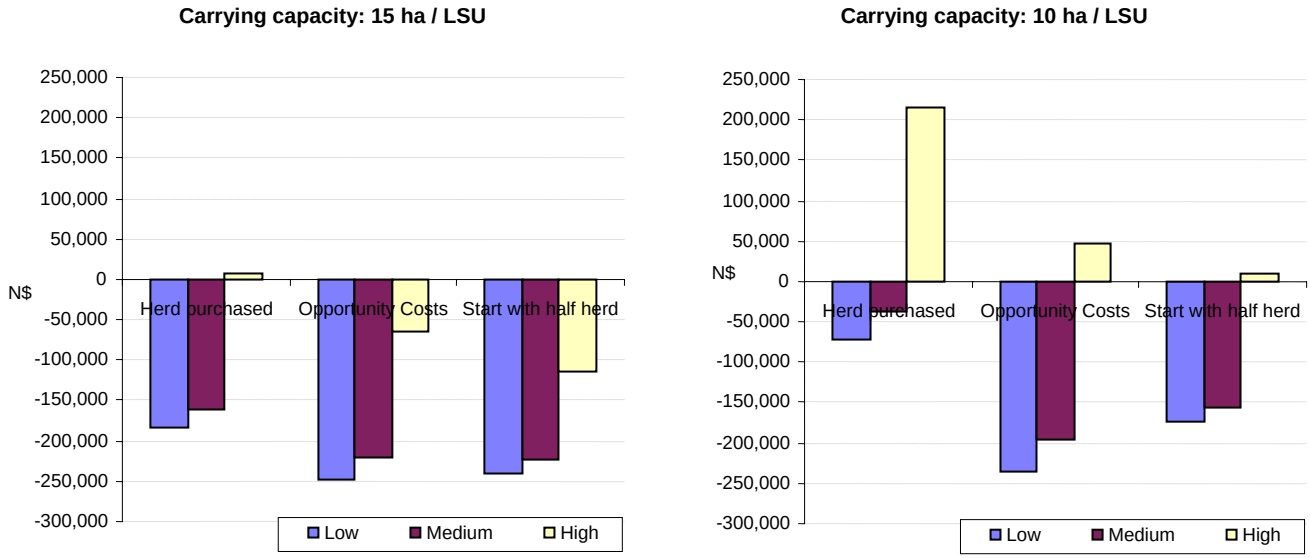
With the exception of the "opportunity costs" scenario, the diagram shows that the internal rate of return (IRR) is at least above zero, and so no capital is lost. However, to reach the hurdle value of 8%, being the minimum required to secure long-term profitability, improved herd management (high production level) is required. Farming at a low or medium productivity level will only attain results that are close to the profitability hurdle under very favourable natural conditions (where 10 ha per LSU or even less are required)

Starting with only half of the herd (Scenario 3) will result in far lower returns than starting with the full herd. Better natural conditions (10 ha/LSU) allow the high productivity category to be profitable, however not even this level is profitable when the carrying capacity decreases.

Similarly, in Scenario 2, where an existing herd is moved from communal areas to a farm (thus incurring opportunity costs), only under favourable natural conditions and best productivity can the profitability hurdle be reached. With the low and medium productivity levels there is a significant loss of capital, con-

sidering the lost alternative income from the communal farming. For all cases where the IRR rates do not exceed the hurdle value of 8%, the net present value (NPV) of the cash flows (based on total capital) will be negative. The following diagram illustrates the relationships between the various scenarios, production levels and natural conditions:

Figure 3.2: Net present value based on total capital invested

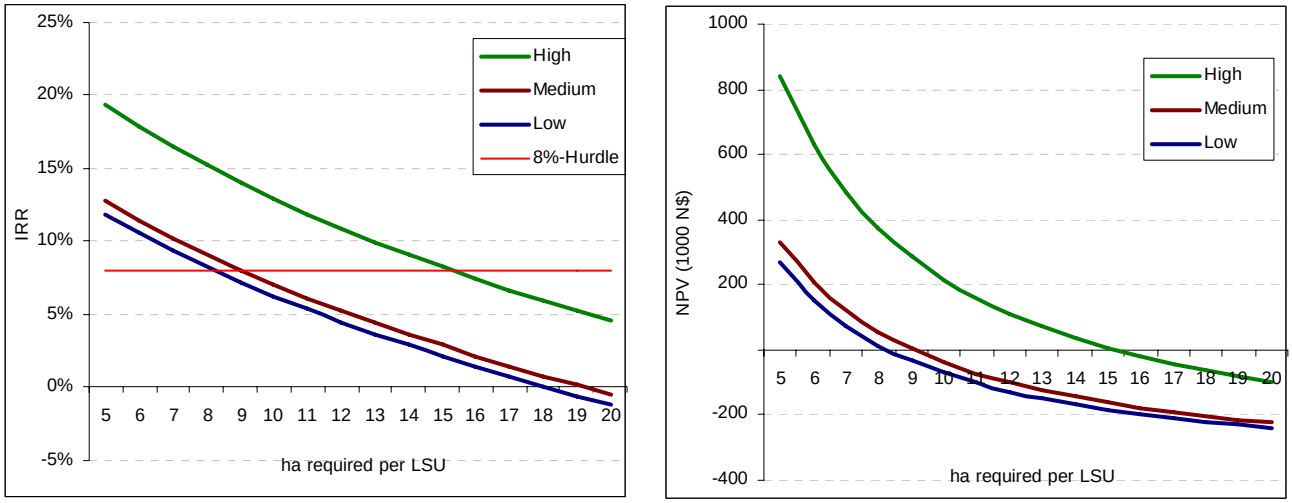


Source: Own calculations

Sensitivity analyses

Since the analyses above show that natural conditions have a significant influence on profitability, a sensitivity analysis was carried out to evaluate the effects of decreasing grassland carrying capacity on profitability. To avoid too many disturbing elements in the diagrams, only Scenario 1 (as the most favourable) was chosen for the sensitivity analysis. For the other scenarios, the results would be much lower.

Figure 3.3: IRR and NPV according to decreasing grassland carrying capacity



Source: Own calculations

The results show that the profitability hurdle (IRR ≥ 8%, i.e. NPV ≥ 0) can only be reached when:

- productivity level is low: with less than approximately 8.3 ha required per LSU
- productivity level is medium: with less than approximately 9.1 ha required per LSU
- productivity level is high: with less than approximately 15.5 ha required per LSU

Where the carrying capacity is low (more than 15.5 ha of rangeland required per LSU), not even the high production level will lead to profitability. Since the other scenarios would return even worse results, it becomes clear that a different marketing strategy is required in most cases. Higher meat prices and a higher proportion of productive cows in the herd could be achieved by reducing the marketing age of the male offspring to a level that meets the market's requirements. Although these issues are discussed in more detail in sub-paragraph 3.2.4, the following sensitivity analysis illustrates how important higher meat prices are when the carrying capacity is low.

Table 3.5: Return to total capital according to carrying capacity of grassland and meat prices

IRR (%)	Carrying capacity of the grassland (ha / LSU)															
Meat price (N$ / kg) [male offspring]	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5
13	-0.4	0.2	0.9	1.6	2.3	3.0	3.8	4.7	5.5	6.5	7.4	**8.5**	**9.6**	**10.8**	**12.0**	**13.4**
14	0.2	0.9	1.6	2.3	3.0	3.7	4.5	5.4	6.3	7.2	**8.2**	**9.2**	**10.3**	**11.5**	**12.8**	**14.2**
15	0.9	1.5	2.2	2.9	3.7	4.4	5.2	6.1	7.0	7.9	**8.9**	**10.0**	**11.1**	**12.3**	**13.6**	**15.0**
16	1.5	2.2	2.9	3.6	4.3	5.1	5.9	6.8	7.7	**8.6**	**9.6**	**10.7**	**11.8**	**13.1**	**14.4**	**15.8**
17	2.2	2.8	3.5	4.2	5.0	5.7	6.6	7.4	**8.3**	**9.3**	**10.3**	**11.4**	**12.6**	**13.8**	**15.1**	**16.6**
18	2.8	3.4	4.1	4.8	5.6	6.4	7.2	**8.1**	**9.0**	**10.0**	**11.0**	**12.1**	**13.3**	**14.5**	**15.9**	**17.3**
19	3.4	4.0	4.7	5.5	6.2	7.0	7.8	**8.7**	**9.7**	**10.6**	**11.7**	**12.8**	**14.0**	**15.2**	**16.6**	**18.1**
20	4.0	4.6	5.3	6.1	6.8	7.6	**8.5**	**9.3**	**10.3**	**11.3**	**12.3**	**13.4**	**14.6**	**15.9**	**17.3**	**18.8**
21	4.5	5.2	5.9	6.7	7.4	**8.2**	**9.1**	**10.0**	**10.9**	**11.9**	**13.0**	**14.1**	**15.3**	**16.6**	**18.0**	**19.5**
22	5.1	5.8	6.5	7.2	**8.0**	**8.8**	**9.7**	**10.6**	**11.5**	**12.5**	**13.6**	**14.7**	**15.9**	**17.3**	**18.7**	**20.2**

Source: Own calculations; Based on calving rate 0.6, marketing age of male offspring 24 months

In the worst case scenario (lowest price and 20 ha needed per LSU), the return to total capital is slightly below zero (that is, a loss of capital). For areas where more than 16 ha of rangeland are required per LSU not even the highest prices secure profitability. Profitable farming at lowest prices is only possible where the carrying capacity is very high (less than 10 ha of rangeland required per LSU). Where 9 to 16 ha are required per LSU, the diagonal line in the table above indicates the minimum prices to be reached in order to farm profitably (the line represents the hurdle value of 8% minimum return to capital).

Another factor that strongly affects profitability is the variety of development costs for a farm. Since this issue is strongly linked to financing and subsidising, it is discussed in the following chapter.

3.2.3 Financing

As described above, the MLR developed two financial models for the development of small scale commercial farms in non-freehold areas.

Scenario 1 is based on the assumption that government will be responsible for all development costs (such as planning, surveying, groundwater investigation, drilling and equipping of boreholes, and fencing). In

Scenario 2, government will only bear the costs of planning, surveying and water provision. Fencing will be carried out at the beneficiary's expense. The capital outlay is expected to be recouped by annual rental fees. The rental fees to be paid annually for farms that were fully developed by the MLR have not been determined yet, but N$5 per ha was used in the calculations for a proposal currently under discussion at the MLR.

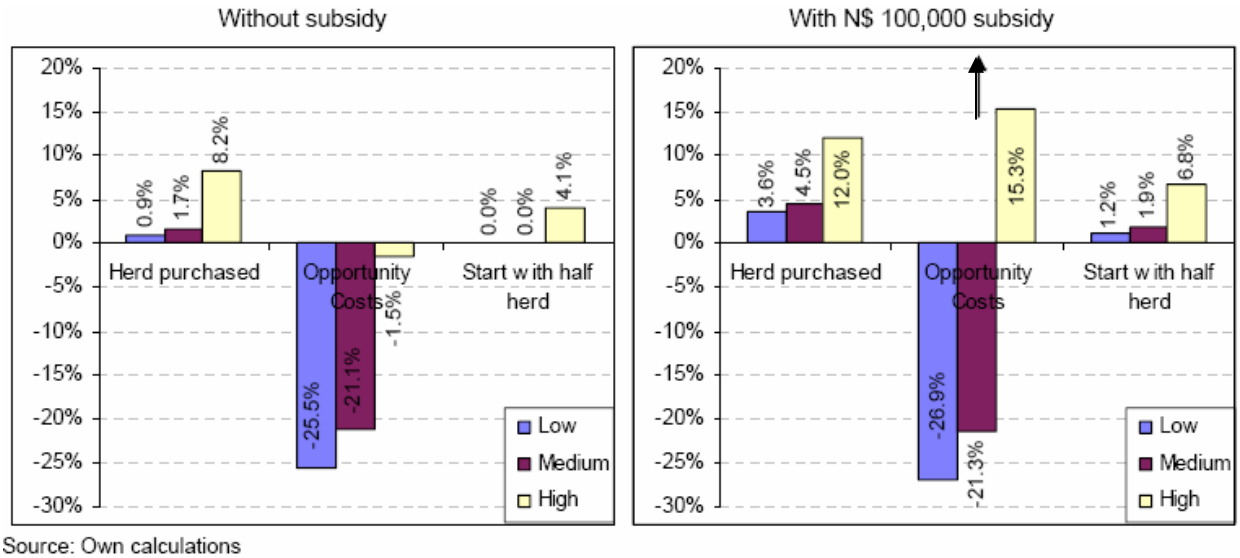
Since government funds for developing surveyed farms are limited, there is also the possibility that beneficiaries of the programme will develop their allocated farms by investing their own capital or using a loan. This will be reflected in lower annual rentals than for farms subsidised by the MLR. At present, farmers who develop surveyed land using their own capital are expected to pay approximately N$9 000 per annum for a 2 500 ha farm – N$3.60 per ha.

Three different variants were evaluated:

A. Using exclusively farmers' own funds for all development (with reduced rent of N$3.60 per ha).
B. Farmer takes a loan to finance the development (with reduced rent of N$3.60 per ha).
C. Development costs subsidised in the amount of N$100 per ha (with full rent of N$5.00 per ha).

Variant A is equivalent to the situation already described above for the return to total capital, since the owners' capital is equal to the total capital when no external financing is involved. For this reason, we will focus on Variants B and C in order to analyse the return to owners' capital. Variant B assumes that the loan will cover the full development costs (excluding labourers' housing) although livestock is financed by own funds. The term of the loan is 10 years and the (real) interest rate used is 8% (derived from a nominal rate of approximately 10.25% to 11% [AgriBank]). The amount of the loan differs according to the scenario (1, 2 or 3) since to start with the complete herd, approximately N$161 000 would be required for a 1 000 ha unit (according to Table 3.1) compared with a loan of N$100 000 for Scenario 3 since farms in this scenario do not need to be fully fenced at the outset (farming commences with half a herd). In Variant C, the subsidy for a 1 000 ha unit would be N$100 000 – enough to finance drilling and equipping of the borehole, and the boundary fencing. The remaining internal development costs are assumed to be covered by a loan (conditions as described for Variant B).

Figure 3.4: Return to owners' capital with and without subsidy (basis: 15 ha/LSU)

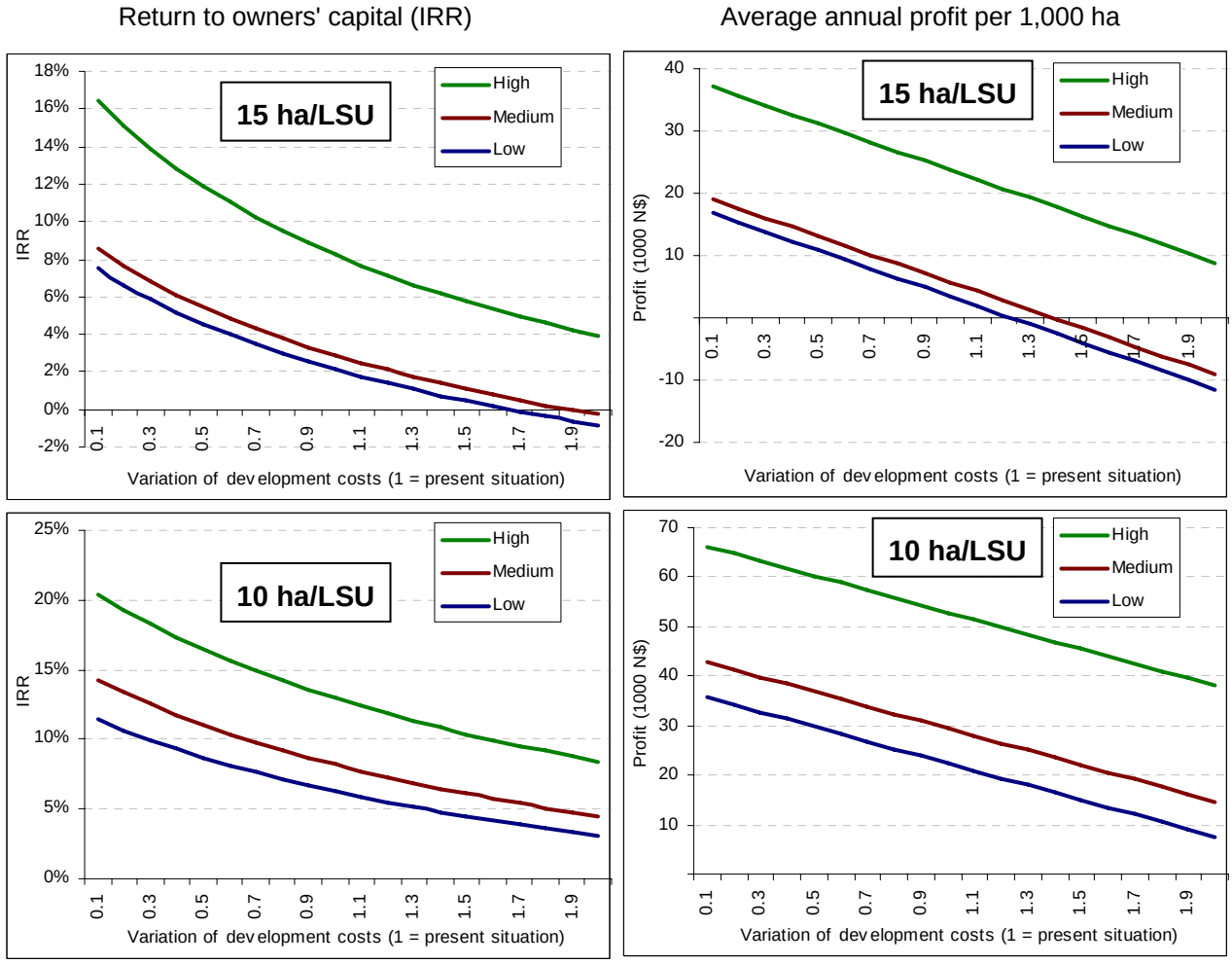


Source: Own calculations

The return to owners' capital, as displayed in the diagram above, clearly shows the financial effect of subsidised farm development. Although the subsidy increases the internal rate of return (compared with the total capital and the situation without subsidy), this increase is not enough to make the low and medium production levels profitable and so the general picture does not change much: under unfavourable natural conditions, only improved productivity and marketing make the investment profitable.

A sensitivity analysis was carried out to illustrate the variation of the results for different carrying capacity conditions and different subsidy levels. However, it not only shows the effects of reduced investment costs for the farmer due to subsidies. but also the effects of increasing development costs due to increased prices for necessary equipment. The X-axis of the diagram below represents the variation of development costs, where 1 stands for the present full development costs as described in sub-paragraph 0. Factors below 1 represent reduced costs due to subsidies, and factors above 1 represent increasing costs.

Figure 3.5: Return to owners' capital (IRR) and annual profit according to varied development costs



Source: Own calculations

The above diagrams again illustrate that with a lower carrying capacity (15 ha/LSU) any subsidy level would be insufficient to make a farm profitable under low and medium productivity conditions. However, with better natural conditions (10 ha/LSU), a 40% subsidy level would make the low production level profitable (IRR > 8%) and provide a substantial contribution to the household's income.

Similarly, *increasing* development costs will affect areas with lower capacities more severely than those with better rangeland conditions. With 10 ha/LSU, a 100% increase in development costs (factor 2) would still result in IRRs and profits above zero (although too low), whilst with lower carrying capacity (15 ha/LSU), any increase of the development costs would make even the high production level unprofitable (IRR < 8%) and considerably reduce the average profit of farming – probably resulting in losses for the low and medium production levels.

In summary, subsidised development of farms has advantages and disadvantages. In areas with lower carrying capacity it is the only way to make farming possible if productivity and marketing are not improved – and even at high production levels, subsidies will be necessary if prices for development equipment rise. However, as can be seen from the diagrams for 10 ha/LSU, subsidies reduce the pressure to improve productivity and marketing. The better the natural conditions are, the easier it becomes for subsidised farmers to earn sufficient returns on their invested capital, even with low or medium productivity. To avoid such counterproductive results, subsidised loans for financing farm development may be a better option than directly subsidising equipment.

3.2.4 Marketing

Meat marketing from north of the Veterinary Cordon Fence (VCF) through the quarantine camps and MeatCo abattoirs is still limited and was not very popular with the farmers we interviewed. Nevertheless, even the prices obtained for meat and livestock within the communal areas are determined (or at least influenced) by MeatCo prices. For future meat producers with true commercial interests, MeatCo will present the only realistic marketing option.

Although the farmers interviewed complained a lot about the difficult marketing conditions controlled by MeatCo (low prices, three-weeks quarantine, high transport costs) the reasons for low revenues are mainly of their own creation.

MeatCo prices are based on the age and subcutaneous fat of an animal. The subcutaneous fat is graded from 0 (no fat) to 6 (excessively overfat) and age grading is categorised as follows:

A Up to +/- 1½ year old (no permanent teeth).
B Up to +/- 2½ years old (one to six permanent teeth).
C Older than +/- 2½ years (seven to eight permanent teeth).

The farmers interviewed usually receive prices based on "C0" because the farmers sell old animals in mostly suboptimal condition. In fact, this approach constitutes one of the most important differences between communal and commercial farming. A farmer with true commercial interests would sell animals when they are in good condition and young enough to be graded as A or B. Farmers in the communal areas tend to keep the male offspring for five to six years (or even longer) until the need to sell arises (for financial reasons). Whilst the farmers interviewed regarded themselves as commercial farmers, their farming practices remained those of communal farmers. Although they may sell male animals younger than five to six years old, the animals were still too old to be graded better than C.

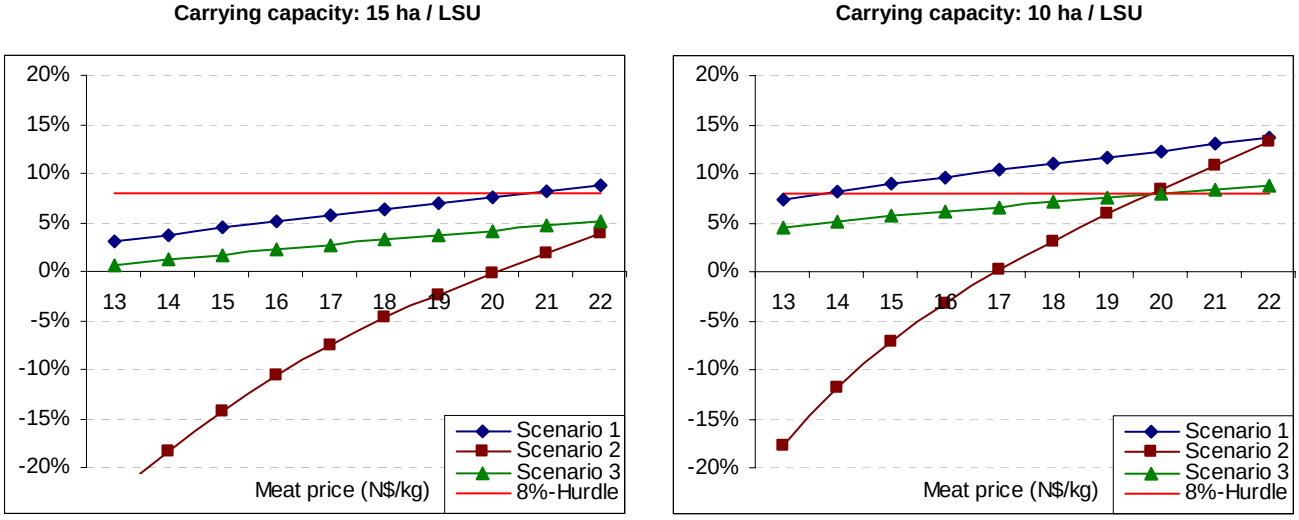
The reasons for this are easy to understand and should not be attributed merely to traditional habits or the fact that livestock are used as an alternative savings account. Firstly, all farmers interviewed earn a regular income from off-farm sources (mostly from own employment). Since there is no need to sell animals to generate an income, livestock is only sold when exceptional financial needs arise. Secondly, a shorter fattening period is associated with a lower marketing weight and thus a lower price for the animal. The latter reason is misleading: shorter fattening periods lead to a lower average number of males kept – that is, fewer animals need to be fed and raised on the same area. Grassland which is not needed for the older males becomes available for productive females, thus increasing the herd size, and by implication, the total production and income from the herd.

The following short calculation may illustrate the described relationships:

> Assuming the gross margin calculations described above (3.2.2) at a calving rate of 0,6 (calves born per cow per year), a selling age of the male offspring of 5 years and a carrying capacity of the grassland of 15:1 (15 ha required for 1 LSU), only 30 cows can be kept on 1 000 ha since the remaining area is needed for the offspring (male and female).
>
> By reducing the marketing age of the male offspring by one year, the number of cows kept can be increased by 4 (or 5) animals, leading to higher productivity and more than compensating for income lost from selling lower weight animals.

Thus, early marketing not only leads to better prices for the meat but leads also to higher productivity and profitability per hectare, due to a higher relative number of productive females. As stated earlier (see Table 3.5), the need to realize higher meat prices is even more important as the carrying capacity of the rangeland decreases. This is further illustrated by the influence of increased meat prices on profitability. The figure below displays the return to total capital (IRR) for the three scenarios according to increasing meat prices. For higher carrying capacities (10 ha/LSU), higher meat prices will lead to profitability (IRR > 8%) even for Scenario 2 (moving existing herd from communal land to individual farm) and for Scenario 3 (starting with half herd) while Scenario 1 (start with full purchased herd) will already be profitable with lower prices. For less favourable rangeland conditions (15 ha/LSU), higher meat prices are a precondition to profitability, although not even maximum prices would make Scenarios 2 and 3 profitable.

Figure 3.6: Return to total capital (IRR) according to increasing meat prices



Source: Own calculations; Based on calving rate 0.6, marketing age of male offspring 24 months

3.3 Economic analysis

3.3.1 Costs

For the economic analysis, the costs of the project were determined on the basis of the financial calculation. Where applicable, the current Value Added Tax (VAT) of 15% was excluded from the calculation. For all internationally tradable items, a foreign exchange premium of 6% was added to the costs. Livestock was regarded as a domestic investment, and so only the premium was applied.

For the economic opportunity costs for labour, a rate of 20% of the financial costs was used, allowing for the high rate of unemployment in the country and also for the fact that labourers on the analysed farms were usually unskilled. The economic opportunity costs for land were determined at a rate of 10% of the rental fee for the land, accounting for that the land used has no (or little) opportunity costs for the economy.

All adjustments were discussed amongst the consultancy teams as well as with a local consultant from the Ministry of Environment and Tourism (Jon Barnes). An explanatory statement for all adjustments made is attached in Annexure 2. Finally, the economic costs for a 1 000 ha unit were determined as follows:

Table 3.6: Economic investment costs to develop a 1 000 ha cattle farm

	Quantity		Financial (N$) Price	Financial (N$) Total	Convers. factor	Economic (N$) Price	Economic (N$) Total
Tradable items							
Fences (border) (shared)	8.47	km	8,000	67,799	0.922	7,374	62,493
Fences (internal)	6.32	km	8,000	50,596	0.922	7,374	46,637
Crush pen, etc.	1.00		10,000	10,000	0.922	9,217	9,217
Reservoirs, pipes, troughs	1.00		10,000	10,000	0.922	9,217	9,217
Pump and engine (shared)	0.25		16,000	4,000	0.922	14,748	3,687
Total				142,396			131,252
Domestic items							
Borehole (shared)	0.25		75,000	18,750	0.870	65,217	16304.348
Simple housing for labourers	2		1,000	2,000	0.870	870	1739.1304
Total				20,750			18,043
Grand total				163,146			149,295

*) Conversion factors: for tradable items: VAT adjustment factor 0,87 (=1/1.15) AND Foreign Exchange Factor 1,06
for domestic items: VAT adjustment factor 0,87 (=1/1.15)

In addition to the inputs taken from the financial calculation, the following costs were added in the economic calculation (per 1 000 ha):

- N$1 571 for plans and subdivision of a farm (= N$6 284 per 4 000 ha farm)
- N$800 per year for extension services
- N$1 200 per year for veterinary services

3.3.2 Benefits

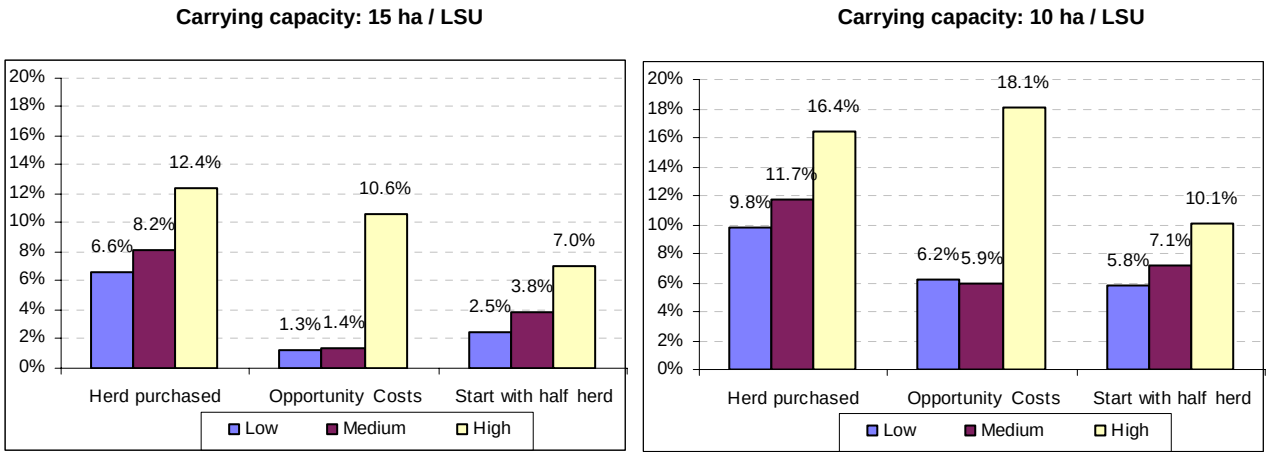
For the economic analysis, the benefits of the project are (like the costs) derived from the financial calculation. Conversion factors are used to determine the economic value of the produced goods. The meat

produced is regarded as internationally tradable and incurs a VAT adjustment factor of 0.87 (= 1/1.15) and a foreign exchange premium of 6%, whilst produced livestock (heifers) is regarded as a domestic product and so only the VAT adjustment factor is used.

3.3.3 Economic viability

The economic analysis was based on the same scenarios and production levels as those used in the financial analysis in order to allow a differentiated evaluation. The resulting economic rate of return of the project variants is displayed in the diagrams below.

Figure 3.7: Economic rate of return for cattle farming



Source: Own calculations

The economic results reach a slightly higher level than the financial results due to the conversion factors described above. Generally, these better results give room for subsidising – only, however, once the hurdle value of 8% is reached. Since the relationships between the different scenarios and production levels remain the same as in the financial calculation, subsidies should not counteract any efforts to raise calving rates, shorten fattening periods and improve meat quality, which increase in importance as the carrying capacity of an area decreases. Therefore, subsidising should be linked to training measures and subsidised loans are preferable to subsidised infrastructure.

The need for improved productivity and marketing in relationship to differing rangeland capacities now reflects the economic rate of return for the project according to meat prices and the carrying capacity of the grassland. The calculation is based on the medium production level (but with a reduced marketing age of 24 months for the male offspring). In the table below, the hurdle value of 8% is represented by a diagonal line to indicate what prices must be reached under which natural conditions to achieve the required 8%.

The results show that even under very unfavourable natural conditions, cattle farms can be economically viable, if productivity and marketing are organised optimally – which is unlikely for most farmers. With unimproved production and marketing practices, farming will not be economically viable in areas where the carrying capacity of the grassland dictates that more than 15 ha are required per LSU.

Table 3.7: Economic rate of return according to carrying capacity of grassland and meat prices

ERR (%)	Carrying capacity of the grassland (ha / LSU)															
Meat price (N$ / kg) [male offspring]	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5
13	4.9	5.4	5.9	6.4	6.9	7.5	8.1	8.8	9.5	10.2	11.0	11.8	12.8	13.7	14.8	15.9
14	5.5	6.0	6.5	7.0	7.6	8.2	8.8	9.5	10.2	10.9	11.7	12.6	13.5	14.5	15.6	16.8
15	6.1	6.6	7.1	7.7	8.2	8.8	9.5	10.2	10.9	11.6	12.5	13.3	14.3	15.3	16.4	17.6
16	6.7	7.2	7.7	8.3	8.9	9.5	10.1	10.8	11.6	12.3	13.2	14.1	15.0	16.1	17.2	18.4
17	7.3	7.8	8.3	8.9	9.5	10.1	10.8	11.5	12.2	13.0	13.9	14.8	15.7	16.8	17.9	19.2
18	7.8	8.3	8.9	9.5	10.1	10.7	11.4	12.1	12.9	13.7	14.5	15.5	16.5	17.5	18.7	20.0
19	8.4	8.9	9.5	10.1	10.7	11.3	12.0	12.7	13.5	14.3	15.2	16.1	17.2	18.2	19.4	20.7
20	8.9	9.5	10.0	10.6	11.2	11.9	12.6	13.3	14.1	15.0	15.8	16.8	17.8	18.9	20.1	21.4
21	9.5	10.0	10.6	11.2	11.8	12.5	13.2	13.9	14.7	15.6	16.5	17.5	18.5	19.6	20.8	22.2
22	10.0	10.5	11.1	11.7	12.4	13.1	13.8	14.5	15.3	16.2	17.1	18.1	19.2	20.3	21.5	22.9

Source: Own calculations; Based on calving rate 0.6, marketing age of male offspring 24 months

Based on the constraints discussed in both sections, recommendations will be discussed in 3.4 below.

3.3.4 Socio-economic impact and external effects

Future farm owners will not be the only project beneficiaries. In many cases, labourers will be employed to look after the cattle. This job creation effect will impact predominantly on unskilled labourers who represent the biggest share of the unemployed population. Given the 5 000 000 ha currently earmarked for development (1 242 farms of approximately 4 000 ha each), approximately 11 000 full-time employment positions could be created.

However, this farming system is relatively labour extensive and thus the job creation benefit self-limiting as only two full-time labourers have been planned per 1 000 ha farm unit. The positive job creation effect for the economy was accounted for in the economic analysis by replacing the financial labour costs with the economic opportunity costs which were assumed to be only 20% of the financial costs. (In some cases, the economic opportunity costs may even be zero.) This has a positive effect on the economic rate of return.

The fiscal benefits of the project (additional tax income for the government) will be negligible since the farm labourers will not pay income tax. (In fact, the same will be true of most farmers.) Only owners of larger farm units, who regularly sell large numbers of cattle, will be obliged to pay taxes. So, state income will be generated mostly in the area of meat sales, but even then, most of the meat will be exported and will not generate additional VAT for the government.

With regard to the environmental impact of the project, two issues deserve mention. One issue is the effect on the biodiversity in the areas concerned; the second concerns the impact on already-scarce water resources. Undoubtedly, the effects are inclined to be negative rather than positive, but such an evaluation is beyond the scope of this study.

3.4 Constraints and recommendations

Summarising the conclusions from the analyses carried out it is apparent that individual cattle farming on a low or medium productivity level (similar to the conditions in the communal areas) can only be financially and economically viable where less than 10 ha per LSU are required. In less favourable areas, only improved production and marketing strategies can secure profitability. However, under conditions where more than 15 ha of grassland are required per LSU, improved production and marketing will only be profitable with subsidies. However, subsidising is only viable when improved production and marketing strategies are applied.

In order to secure financial and economic success the following major conditions have been identified:

- Productive calving and weaning rates.
- Earlier marketing.
- Carrying capacity and supplementary feeding.
- Developing a strategy for herd development.
- Financing the initial investment.

Recommendations for maximising these conditions are discussed in the following paragraphs.

Productive calving and weaning rates

During the interviews with the farmers in the Mangetti Scheme it emerged that farmers knew little about their herds or their animals' reproduction rates. Farmers barely knew how many cattle they had, let alone the exact number of calves born in a specific season or by a specific cow. Nevertheless, in many cases animals had been earmarked (ear tags) and numbered for easy identification. The first important step towards improving productivity is knowledge of the herd: this could be achieved by using simple record sheets. There is no need for sophisticated bookkeeping systems; simple calving records would help to create awareness of calving rates.

Higher calving rates require increased input in terms of supplementary feeding and health care, but these additional costs would be more than covered by the increase in income as demonstrated by the financial analyses for the various production levels.

Suggested records sheets are attached in Annexure 3 (on the CD). Since the interests and abilities of the farmers (and farm workers) differ, a variety of sheets with different levels of complexity have been developed. In the simplest version, calving dates are listed for individual cows. In a detailed version of this form, individual record sheets are proposed for each cow on which breeding information can also be documented. For those who are interested, record sheets for major costs are provided as well.

Earlier marketing

The marketing strategies of farmers wanting to run commercially viable operations must be brought in line with the demands of MeatCo. It is therefore highly recommended to select people as future farm beneficiaries who have a strong grasp of the need for market-orientation in cattle farming, This is more likely to be found amongst people who have little (or no) off-farm income.

Carrying capacity and supplementary feeding

As illustrated above, the carrying capacity of the grassland plays an important role in determining the profitability of cattle farming. Although the carrying capacity is determined by the natural conditions of an area, in commercial cattle farming both in Namibia and around the world, supplementary feed is used to boost the natural potential of the grassland. In the communal areas and on the Mangetti Scheme farms that were visited, supplementary feed was limited to mineral and salt licks, sometimes combined with vitamins and energy. However, effective supplementary feeding goes beyond this. Purchased feed like hay or even grain concentrates should be available during dry periods to avoid animal losses and the optimal use of vitamins, minerals, protein and energy concentrates can be very effective in producing high quality beef.

Since these issues could not be analysed during the short time available for this study, it is highly recommended that the issue be further investigated with regard to financial viability, logistics and organisational requirements.

Developing a strategy for herd development

Starting with less cows than the carrying capacity of the rangeland would allow (and increase the number subsequently over time) will affect the profitability negatively. Although such a strategy might by driven by liquidity shortages farmers should try to use the full rangeland capacity from the beginning.

Financing the initial investment

Clearly, the cattle farms have the potential to generate a return on the capital invested. However, the less favourable the natural carrying capacity of the land, the more important improved cattle husbandry and marketing strategies to farm efficiently. Improved cattle husbandry and marketing strategies make it quite reasonable for the government to offer farming subsidies. On the other hand, given improved farming conditions, loans could also be used efficiently since the internal rates of return from the investment could be higher than the rates charged by the bank. It is advisable to facilitate farmers' access to loans by helping with collateral. Additionally, subsidising loans (with reduced interest rates and/or grace periods) may also be more advantageous than directly subsidising farm infrastructure since this could lead to greater cost effectiveness and could help farmers to farm more efficiently since the farm infrastructure is not perceived as belonging to the government.

Training

Contrary to popular belief, not everyone has the ability or the knowledge to farm cattle *successfully*, and training in record-keeping, market-orientation, supplementary feeding and the use of loans is needed, particularly to support the financial and economic viability of cattle farming in the northern parts of Namibia in general and for the projected cattle farms in particular. To encourage people to attend training days, the training could be offered free of charge, or even associated with subsidised inputs. Alternatively, the training could be a precondition to receipt of a loan or a subsidised farm.

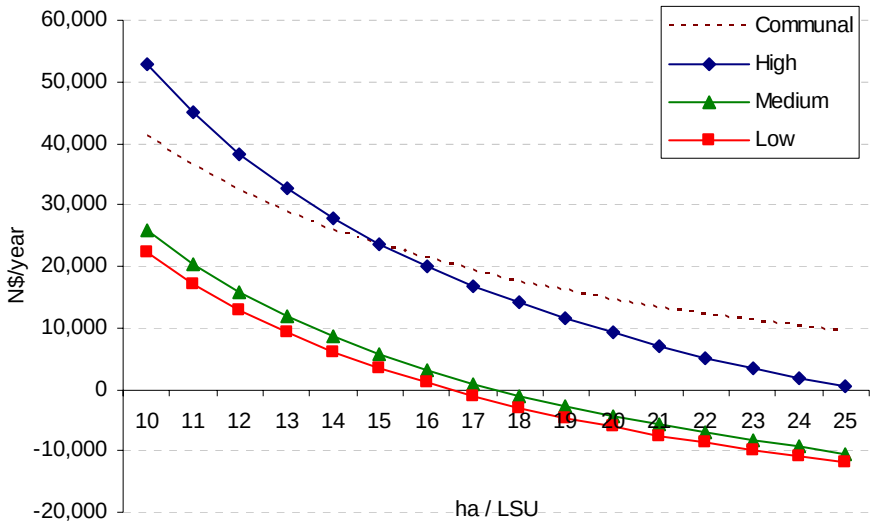
Income generation and minimum farm size

After having discussed all the constraints, recommendations and advisable improvements it might have already become clear, that the question of minimum farm size for sufficient income generation is not directly related to the number of ha available and not only related to the number of animals kept.

Where natural grassland conditions are favourable and production and marketing optimal, a farm of 1 000 ha *can* generate sufficient income for a farming family and for two extra workers (see For this exercise, it was assumed that 60% of the fixed assets were financed by a loan (considering that with time, the farmer would replace some of the fixed assets using his or her own capital). In the case of a subsidised farm, interest payments would be lower, but by then these would be off-set by payment of the full rent for the land (N$5 000 per year). Wages are based on the assumption that two full-time labourers would be employed at N$6 000 per person per year. If family labour is used exclusively, the wages paid could be added to the profit of farming as a contribution to the consumable household income. If labourers are employed, the profit of farming represents the farm owner's annual contribution to the consumable household income. Only where debts repayments exceed farm depreciation would these higher repayments to the bank further reduce the consumable household income. For a more detailed analysis of the effects of financing, please refer to the results of the dynamic analysis below.

Table. 3.4). However, for the majority of the future farmers, these two conditions will not apply.

Figure 3.8: Annual farm profit according to carrying capacity of grassland (per 1 000 ha)



Source: Own calculations

The diagram above illustrates how the annual farm profit for a 1 000 ha unit would decrease with increasing requirements of grassland per LSU. If natural conditions are favourable, a 1 000 ha farm has the potential to generate a substantial income even under low and medium productive conditions. For less favourable areas, more than 7 400 ha would be needed when farm productivity is low, and at least 4 400 ha would be needed when farm productivity is at a medium level. (Adequate annual income was deemed to be N$25 000 for this approximation.)

However, farming at a low or medium productivity level where the carrying capacity is low is not profitable anyhow, since the return on capital investment is not appropriate – not even on 4 000 or 7 000 ha.

Thus, political emphasis should placed on the improvement of production and marketing practices rather than on increasing the size of the farming units. For such less favoured areas where 10 to 15 ha are required per LSU a unit size of 1,500 to 2,500 ha will surely not be sufficient when farming on a low productive basis but that size *does* have the potential to provide sufficient income when improvements towards the described "high" level are achieved. Where more than 15 ha/LSU are needed, a positive profit can only be achieved under improved production and marketing conditions, but even then, the income cannot compete with farming under communal conditions. (For comparison, the curve for the communal areas is also displayed, which shows that the less favourable the natural conditions are, the less advantageous it is to farm individually with high development costs instead of farming on a low input basis in the communal areas.)

This raises another option: allowing unfenced communal farming on the projected land instead of fenced individual farming. Since fencing costs represent the biggest part of the development costs for farms, avoiding these costs would increase the profitability significantly. Whilst the data collected for this study did not lend itself to a detailed analysis of this proposition, it is highly recommended that this issue be further investigated.

4 ANALYSIS OF THE GREEN SCHEME

By
Christian Schuh
Wolfgang Werner

4.1 Background

4.1.1 Objectives of the programme

Like the proposed development of small scale commercial farms in communal areas, the Green Scheme was established to enhance the socio-economic development and upliftment of rural communities. In addition, it forms a crucial component of the government's strategy to increase food production in Namibia. This process started in 1998 with the government's appointment of consultants to investigate whether more food could be produced locally as part of an import substitution strategy. In the wake of the recommendations of the consultants and in order to enhance local horticultural production, the National Horticulture Development Initiative was embarked upon and a National Horticulture Task Team (NHTT) appointed in 2002. The latter has been incorporated into the Namibian Agronomic Board. The task team is representative of producers, wholesalers, consumers and government officials. Key development focus areas of the National Horticulture Development Initiative include:

- The development of a comprehensive database;
- The development of marketing infrastructure;
- The development of an import permit system; and
- Addressing production issues such as training, credit schemes and the introduction of new technology.

The National Horticulture Task team commissioned a consultancy to investigate the feasibility of the potential development of infrastructure for the marketing of horticultural produce in Namibia (IDC et al 2004).

Irrigation schemes developed in terms of the Green Scheme policy are expected to run along commercial lines, thus aiming at the commercialisation of smallholder irrigation. The role of the state will be limited and will mainly entail the creation of an environment that will facilitate public-private partnership in order to stimulate private investments in the irrigation sub-sector.

The Green Scheme will support Namibia's cross-sectoral development aims and objectives as articulated in documents and policies such as V2030 and the National Development Plans. More specifically, the Green Scheme is expected to contribute to the achievement of these objectives by:

- Contributing towards food security and food self-sufficiency;
- Improving nutrition at household level;
- Creating employment, specifically emphasising the participation of women and unemployed youth;
- Diversifying the agricultural base with a view to drought-proofing;
- Maximising the production of high value horticulture products to local and external markets;
- Providing secure livelihoods for growing rural populations;
- Reducing poverty levels by improving income levels; and
- Minimising government intervention and encouraging private sector involvement.

The Green Scheme will also decrease Namibia's dependence on imported food. Less than one quarter of Namibia's total national food requirement is produced locally. It is hoped that the agricultural sector will be able to satisfy about 50% of the national demand locally in the foreseeable future.

4.1.2 Guiding policies and strategies

The cross-cutting and sector-specific policies and strategies discussed in the previous chapter also apply to the Green Scheme. These will not be discussed again. Suffice to say that the Green Scheme, as an intervention to develop agricultural production in the non-freehold sector of Namibia, is expected to contribute to the attainment of V2030, National Development Plans and poverty reduction strategies and plans. The policy and legal framework that governs the demarcation of communal land for the development of small scale farming units and procedures to apply for and be granted leasehold also applies to the Green Scheme.

A number of specific policies and strategies have been developed for the encouragement of horticultural production and the Green Scheme.

The Green Scheme Irrigation Policy outlines the policy and strategies of the Green Scheme. The Green Scheme will consist of a number of individual irrigation projects, which will have to comply with the development objectives set out in the policy in order to qualify for the incentives offered by government.

A Green Scheme Agency has been established in terms of the Green Scheme Irrigation Policy. It will facilitate and coordinate the development of individual irrigation projects in line with Green Scheme objectives. The policy provides for the establishment of commercial irrigation enterprises which will be responsible for the management and provision of clearly defined support services to small scale irrigation farmers in a joint enterprise. However, the commercial and small scale enterprises will operate independently of each other, and along commercial terms. The commercial farming enterprise has to facilitate capacity building and skills transfer to small scale farmers as well as provide agricultural support on a cost recovery basis. In return, government will offer suitable incentives which include access to infrastructural and financial resources at subsidised rates and tariffs. Subsidies have to be repaid in full in the event of an irrigation farmer leaving a project within a 10-year period of initial project start-up.

Green Scheme participants will be able to obtain long-term lease agreements through communal land boards. Such leaseholds will entail specific requirements relevant to achieving the objectives of the Green Scheme as well as meeting the requirements of individual projects.

The policy recommends that traditional authorities be involved in a profit-sharing scheme with the commercial enterprise to account for any opportunity costs incurred in releasing land for an irrigation project. Annual rental charges should thus be the lowest possible amount acceptable to land boards in order to increase the percentage distributable by the commercial irrigation enterprise to traditional authorities.

The National Water Policy proposes some strategies that have a direct bearing on the Green Scheme in cluding the introduction of abstraction fees to enforce economic efficiency and create incentives for the most beneficial use of water and regulations concerning metering and reporting obligations. The Water Policy also proposes to promote the adoption of volumetric pricing policies particular for industry and agriculture to reflect the marginal cost of water services and discourage low-value, high volume users. However, water allocation should be based on socio-economic analysis and the principle of equity. The Green Scheme Policy states that subsidisation requirements should be based on the real value of water costs, the irrigation methods used, the crop production programme as well as the size of the project area and climatic conditions within that area. Water subsidies should be decreased gradually after an initial

start-up period of 5 to 10 years. The Green Scheme Agency should govern and monitor the pricing of water supply services by the service provider as well as report on water usage.

4.1.3 Implementing agencies

4.1.3.1 Provision of financial support

Government, through the MAWF, will fund predevelopment studies as well as all bulk infrastructure for the provision of water to farm gate. Government will also provide predetermined interest rate incentives and loan collaterals on long-, medium- and bridging finance requirements of the farmer. Interest rate incentives have been determined as follows:

Table 4.1: Financing conditions for Green Scheme farmers

Year (after start-up)	% of interest paid by government	
	Development capital	Working capital
1	100	20
2	100	20
3	100	20
4	70	10
5	50	5
6	20	0
7	0	0

Source: Green Scheme Agency

Government may also consider short-term water tariff incentives where needed. Such incentives will be mainly aimed at the small scale farmers and will not exceed a period of 10 years.

All on-farm costs will have to be borne by irrigators. These include on-land water distribution and irrigation equipment, de-bushing, -stumping and – rooting of fields as well as housing requirements and storage facilities. To finance these costs, irrigators will need to take up agricultural credit on terms and conditions determined by financial institutions. The GSA will provide assistance to farmers in this regard.

4.1.3.2 Provision of technical support

The Green Scheme will require high levels of technical and management support to achieve its objectives. However, irrigation skills and expertise are thinly spread within government and outside, partly due to the fact that Namibia does not have a long history of irrigation. To optimise available technical and managerial skills, government decided to create an environment in which the private sector can take a leading role in providing technical support in the development and implementation of the Green Scheme.

Under the Green Scheme, the commercial farming unit will act as a service provider. This includes the maintenance of the bulk water supply infrastructure and adequate water provision, provision of mechanised equipment as well as advisory or extension services to small scale farmers. The MAWF will also provide extension services. The Green Scheme Agency (GSA) will coordinate technical aspects of implementation.

Additionally, applicants for a small scale farming unit will be trained at the Mashare Agricultural Development Institute (MARDI) on a new, specially designed training course. Since the curriculum was made

available for this study, some comments on the training contents have been elaborated, which can be found in paragraph 4.4 (Constraints and recommendations).

4.1.4 Institutional environment

The MAWF is the initiator and implementing agency of the Green Scheme. It will facilitate the governance and mentorship functions of the Green Scheme and create an enabling environment for the its objectives to be achieved. It set up the GSA as a neutral institution to advise the MAWF and coordinate implementation. Its main functions can be summarised as setting irrigation project objectives, monitoring and evaluating achievements of projects, and reviewing guidelines and regulations where activities fail to meet desired objectives. Some of its specific responsibilities include the following:

- advise on appropriate farm units;
- determine budget requirements for the MAWF in terms of capital incentives and subsidy schemes;
- review tariff structure of bulk water and electricity providers;
- review submitted leasehold applications for communal land identified as suitable for irrigation as well as business plans and feasibility studies accompanying such applications before making a recommendation to the MAWF;
- assist applicants to submit proposals to the MLR once the project has been approved by MAWF; and
- review applications submitted to the communal land boards and make recommendations regarding the acceptance or denial of an application.

The MLR will provide final authorisation for the utilisation of communal land for the development of an irrigation project subject to the provisions of the Communal Land Reform Act, 2003 (CLRA). The provisions governing this process are the same as for the development of communal land for small scale commercial farms and have been discussed above. The functions of the MLR have been decentralised to communal land boards, which are responsible for the approval or cancellation of lese agreements. CLB have to ensure that traditional authorities have given their consent for a proposed project to be implemented. The CLRA requires that lease agreements can only be approved by a CLB if traditional authorities have consented.

Regional Councils (RC) are not directly involved in the Green Scheme. The only link at present between RC and the GS are through the CLB, on which all RCs are represented. The representative of the regional council on the CLB can bring any concerns the regional council may have about the GS to the attention of the CLB and the Green Scheme Agency. The observations made in the previous chapter on the likelihood of regional councils competing for revenues generated by the development of communal areas in their regions apply equally to the GS.

Central to the Green Scheme concept is the commercial irrigation enterprise as service provider to small scale irrigator. Services have to be provided on a cost-recovery basis and include the provision of irrigation water; the provision of crop production inputs; the provision of mechanisation services and the provision of marketing and distribution services. Commercial irrigation enterprises will also assist the MAWF in building irrigation capacity and transferring necessary skills to small scale farmers.

Financial institutions will play an important role in providing credit to irrigation farmers. The GSA will guide farmers and provide recommendations to lending institutions. However, financial agreements entered into by participants of a project will be decided on a case-by-case basis.

At present, water rights are granted by the MAWF. However, regional water boards will be established in the foreseeable future to ensure effective water management. Irrigation projects will then have to apply to these boards for water permits.

4.1.5 Selection and characteristics of sites

The selection of sites for Green Scheme development is governed by the availability of reliable water, suitable soils and low population densities. The Department of Water Affairs has identified water abstraction potentials from perennial rivers for irrigation as follows:

- Orange River 12 000 ha
- Kunene River 6 000 ha
- Kavango River 12 000 ha
- Zambezi River 15 000 ha

To reduce the costs for the development and operation of bulk water infrastructure, sites for irrigation should be as close as possible to rivers. It is likely that some suitable irrigation sites will coincide with areas where local communities practise rain-fed cultivation close to rivers. In such instances, established communal farmers need to be integrated into the Green Scheme development, or compensated for loss of land and income according to procedures and compensation guidelines laid down by Cabinet and the CLRA.

The identification of specific sites for irrigation projects under the Green Scheme will be jointly initiated by the commercial irrigation farmer and small scale farmers with the support of the local land board and traditional authorities. The GSA will make a recommendation to the MAWF that an evaluation of the suitability of the land area should be conducted. This will include soil analyses, environmental impact assessments, water resource availability and sustainability as well as social and economic impact assessments.

4.1.6 Existing financial and economic data and publications

Financial consultants developed a cost-benefit analysis of the Green Scheme and Horticulture Initiative in early 2005 (PriceWaterhouseCoopers 2005). The study establishes the macro-economic impact of the Green Scheme without giving details of the baseline data used for the calculations and especially how the contributions of small scale farmers was valued. It does not provide an analysis of the socio-economic impact at household and community level with regard to incomes and employment creation. No analysis was done to guide decision makers on the appropriate size of a holding for small scale irrigators, cropping mixes and acceptable levels of rental fees and water tariffs.

In an earlier study, GFA*terra systems* (2003) provided gross margin calculations for selected crops produced at Aussenkehr and Naute Dam. These calculations were based on data supplied by the Namibia Development Corporation and the MAWF. Due to time and data constraints, these calculations were very

broad and based on data from specific enterprises. They therefore did not purport to be representative of irrigation projects, but rather intended to provide rough pointers.

4.2 Financial analysis

[The models developed for the financial (and economic) analysis are attached in Annexure 4. All calculation files (Excel files) can be found on the accompanying CD. They are designed in a way to allow further modelling and altering for the interested user.]

4.2.1 Investment costs

The models developed for the analysis of the Green Scheme are based on the size and layout of the project in Ndonga Linena[2], since this is the only project for which development costs could be obtained. Ndonga Linena is situated close to the Kavango River, 90 km east of Rundu. It comprises a total area of approximately 800 ha which is subdivided into four units, of which approximately half of the area will be used by the service provider and half will be available for 29 to 32 small scale farmers (using 3 ha each). In 2006, the off-field bulk infrastructure for two units (approximately 400 ha in total) had already been installed by the government. For the developed models, only one unit (Unit 2) is used, since each unit is financially independent from the others. The chosen unit consists of 100 ha for the service provider and 32 plots of 3 ha each for (32) small scale farmers. Since the installed bulk infrastructure is shared between two units, half of the costs are attributed to Unit 2. The total amount spent on off-field investment costs (by the government) together with the prospected on-field investment costs (by the farmers) and the resulting annual depreciation and maintenance expenditure are summarised in the table below.

Table 4.2: Investment costs and resulting annual costs for a 200 ha irrigation scheme

	Amount		Price (N$)	Total (N$)	of it: SP*	of it: SSF*	per 1 SSF*	Depric.	Maint.
Off-field infrastructure (provided by gov.)									
De-bush & de-stump	0.5		3,000,000	1,500,000	750,000	750,000	23,438	3.3%	0%
Pump station	0.5		6,500,000	3,250,000	1,625,000	1,625,000	50,781	6.7%	2.0%
Riser main	0.5		7,000,000	3,500,000	1,750,000	1,750,000	54,688	6.7%	2.0%
Electricity	0.5		1,500,000	750,000	375,000	375,000	11,719	6.7%	2.0%
Roads	0.5		100,000	50,000	25,000	25,000	781	6.7%	0.5%
Fencing	0.5		150,000	75,000	37,500	37,500	1,172	6.7%	5.0%
Total				9,125,000	4,562,500	4,562,500	142,578		
On-field infrastructure (provided by SP/SSF)									
Buildings & structures	1		1,000,000	1,000,000	1,000,000			3.3%	0.5%
Tractors & implements	100	ha	7,000	700,000	700,000			6.7%	**)
Irrigation systems SP	100	ha	12,000	1,200,000	1,200,000			6.7%	3.0%
Irrigation systems SSF	96	ha	7,500	720,000		720,000	22,500	6.7%	3.0%
housing small farmers	32	plots	25,000	800,000		800,000	25,000	3.3%	0.5%
Total				4,420,000	2,900,000	1,520,000	47,500		

[2] The *Information Document for Prospective Developers* for the Ndonga Linena Scheme is attached in Annexure 4 (CD)

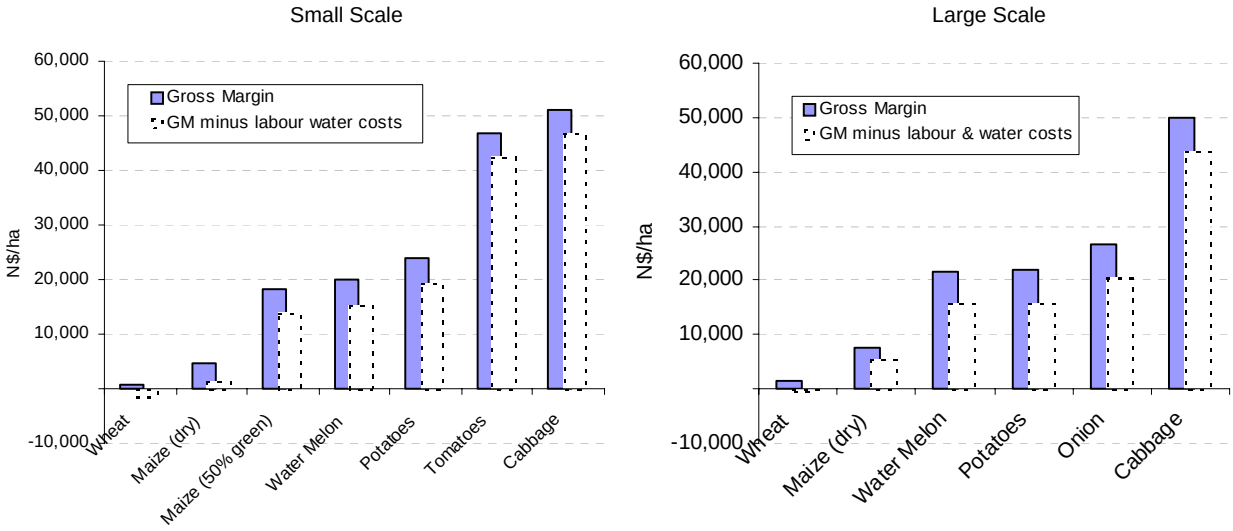
Total investment costs		**13,545,000**	**7,462,500**	**6,082,500**	**190,078**
Depriciation	Off-field infrastructure	558,333	279,167	279,167	8,724
(N$ / year)	On-field infrastructure	234,667	160,000	74,667	2,333
	Total	793,000	439,167	353,833	11,057
Maintenance	Off-field infrastructure	154,000	77,000	77,000	2,406
(N$ / year)	On-field infrastructure	66,600	41,000	25,600	800
	Total	220,600	118,000	102,600	3,206

*) SP = Service Provider, SSF = Small Scale Farmers **) included in Gross Margins
Source: Own calculations based on information from Green Scheme Agency

4.2.2 Financial viability

The information on yields, market prices and variable costs for the gross margin calculations for the developed models is based on data from the Green Scheme Agency and from the interviews with farmers at the Shadikongoro (Kavango) and Etunda (Ovambo) Irrigation Schemes.

Figure 4.1: Gross margins for the crops cultivated under large and small scale production



Source: Own calculations

The diagrams show clearly the differences in the potential of grain crops (wheat, maize) and horticulture crops (vegetables, watermelon). The number of crops that can be grown (and that *are* grown at the visited sites) is of course much higher. However, from the variety of crops cultivated by the small scale farmers, only those for which information could be obtained directly from the farmers were chosen for the modelling,. Even this reduced number of crops sufficiently represents the financial potential of the different crops grown.

The left (coloured) bars in the diagram show the gross margins before deducting possible labour and water costs (only electricity costs for pumping the water are included); the right (white) bars show the results after labour and water costs have been subtracted. According to the *Information Document for Prospective Developers* for the Ndonga Linena Scheme, the water pumped from the Kavango River for this particular project will be free of charge. Therefore, water costs are excluded in the models but (based on information

from the Etunda Irrigation Scheme) the issue of water costs (or of water tariffs for the use of the infrastructure) has been especially evaluated in a sensitivity analysis.

The labour costs accounted for in the case of the service provider (large scale production) are the wages paid to the field workers (administration and management labour included in the fixed/overhead costs). For small scale farmers, the labour costs calculated comprise both wages paid and imputed costs for family labour. It is assumed that 20% of the labour requirements are provided by paid labourers (wages) and 80% of the work is carried out by the farming family (causing imputed costs). On basis of the gross margins shown above, a variety of farm models have been developed. The three major variants display:

a) the situation of the complete unit (service provider + 32 small scale farmers = 200 ha);
b) the situation of the service provider only (100 ha);
c) the situation of one small scale farmer (3 ha).

For each of these three variants, additional scenarios have been elaborated for different cropping patterns. The base variant with 0% of horticultural crops planted means that only grain crops are cultivated (maize, wheat). With increasing percentages of horticultural crops cultivated, the total gross margin and profit of farming increases. For all scenarios a static and a dynamic analysis was carried out. The static calculation shows the average annual income in terms of profit of farming based on the total gross margin. In addition to the profit, in a separate line, the "Profit of farming excluding the depreciation for off-field infrastructure" is shown (= profit plus depreciation for off-field infrastructure). This was done to show what the income for the service provider and the small scale farmers was if the off-field infrastructure was not be regarded as a cost of farming. This is not a viable approach when evaluating the profitability of the total capital invested, but it may show how even an unprofitable enterprise can create income when subsidised.

Analysis of the complete unit (200 ha)

For the complete farm unit of 200 ha, the calculation of the profit of farming based on the total gross margin for different proportions of horticultural crops cultivated is displayed in the table below (derived from a static calculation). Additionally, the internal rate of return and the net present value (based on total capital) taken from the dynamic calculation are also shown. The water costs and the rent for the land are set to zero; both will be analysed separately in a sensitivity analysis.

Table 4.3: Financial profitability coefficients for Green Scheme – complete unit (200 ha)

Proportion of hortic. crops		0%	5%	10%	15%	20%	25%
Total Gross Margin	N$/y	**1,450,000**	**2,116,538**	**2,783,075**	**3,449,613**	**4,116,150**	**4,782,688**
- Depreciation for fixed assets	N$/y	793,000	793,000	793,000	793,000	793,000	793,000
- Maintenance of fixed assets	N$/y	220,600	220,600	220,600	220,600	220,600	220,600
- Overheads (large scale)	N$/y	200,000	200,000	200,000	200,000	200,000	200,000
- Water costs	N$/y	0	0	0	0	0	0
- Wages paid	N$/y	294,667	334,000	373,333	412,667	452,000	491,333
- Interest paid	N$/y	65,970	66,956	67,941	68,926	69,912	70,897
- Rent paid	N$/y	0	0	0	0	0	0
- Profit share for RC, TA, PW	N$/y	19,410	82,032	144,653	207,275	269,897	332,519
Profit of farming	**N$/y**	**-143,647**	**419,950**	**983,547**	**1,547,144**	**2,110,741**	**2,674,338**
PoF excl. depric. For off-field infrastr.	N$/y	414,687	978,284	1,541,881	2,105,477	2,669,074	3,232,671
Internal rate of return (total capital)		-4.2%	2.9%	8.6%	13.7%	18.5%	22.9%
Net Present Value (total capital)	N$	-9,752,848	-4,566,775	619,299	5,805,372	10,991,445	16,177,519

Source: Own calculations

For the pure grain crop variant, the average annual profit of farming and the return to total capital invested (internal rate of return) are both negative. However, excluding the depreciation for the off-farm infrastructure, a substantial (but still too low) income is already generated – which is of course only a result of the subsidised infrastructure.

When 5% of the area is used for horticultural crops, the profit of farming and the internal rate of return are positive, but still unprofitably low. The hurdle value of 8% for the return on total capital invested is far from attainable and the achieved profit is insufficient for all farmers involved.

This changes when 10% of the area is used for horticultural crops. Now the project creates sufficient profit for the farmers involved and the internal rate of return exceeds the hurdle value of 8%.

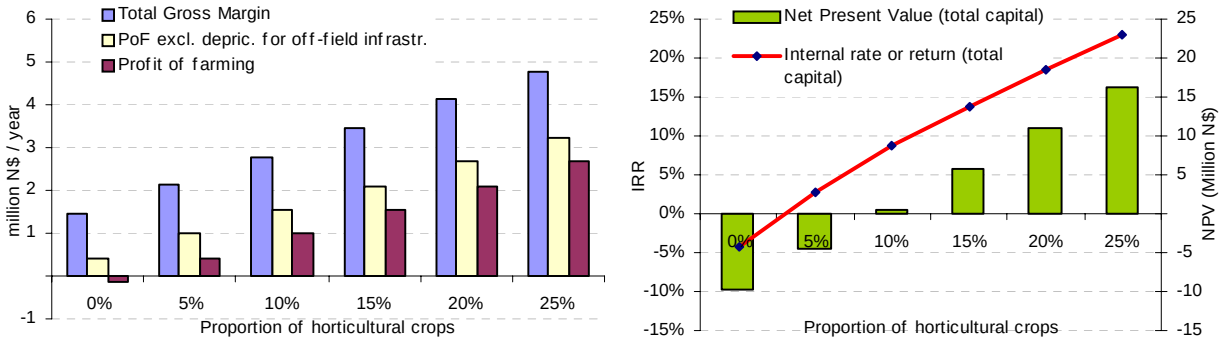
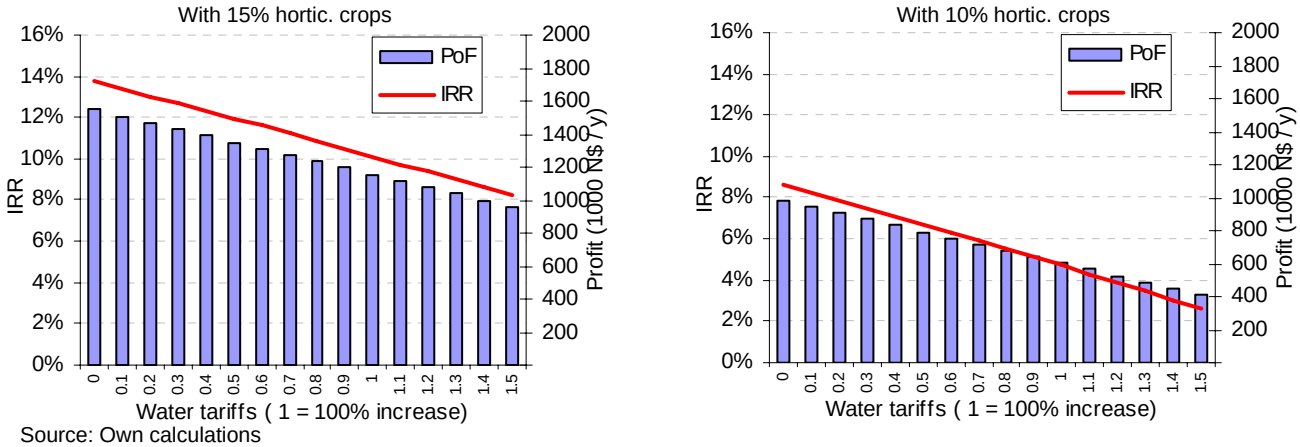


Figure 4.2: Financial profitability coefficients for Green Scheme – complete unit (200 ha)

Source: Own calculations

Of course, the picture will change again when water tariffs are raised. The results of the sensitivity analysis displayed in the diagram below were derived by raising the existing electricity costs for water pumping by using a factor (which is drawn on the X-axis). A factor of 0.1 means that the costs are raised by 10%, a factor 1 represents an increase of 100%. The diagram shows the decrease of the internal rate of return for total capital (line) and the average annual profit of farming (bars).

Figure 4.3: Profitability for Green Scheme with water tariffs



Source: Own calculations

On the basis of 15% of horticultural crops cultivated, the water costs could be increased by 150% until the profitability falls below the hurdle value of 8%. Assuming only 10% horticultural crops are cultivated, an increase of the water costs by only 20% will lead to insufficient profitability.

Analysis of the large scale unit (100 ha)

The same analyses were carried out for the 100 ha unit as for the complete farm unit. The conditions for the service provider are considerably less advantageous when compared with the overall situation, since the service provider has to bear the costs of maintaining and replacing the off-farm infrastructure on his or her own, as well as the overhead costs and profit share for the relevant regional council, the traditional authorities and the permanent workers.

Table 4.4: Financial profitability coefficients for Green Scheme – service provider (100 ha)

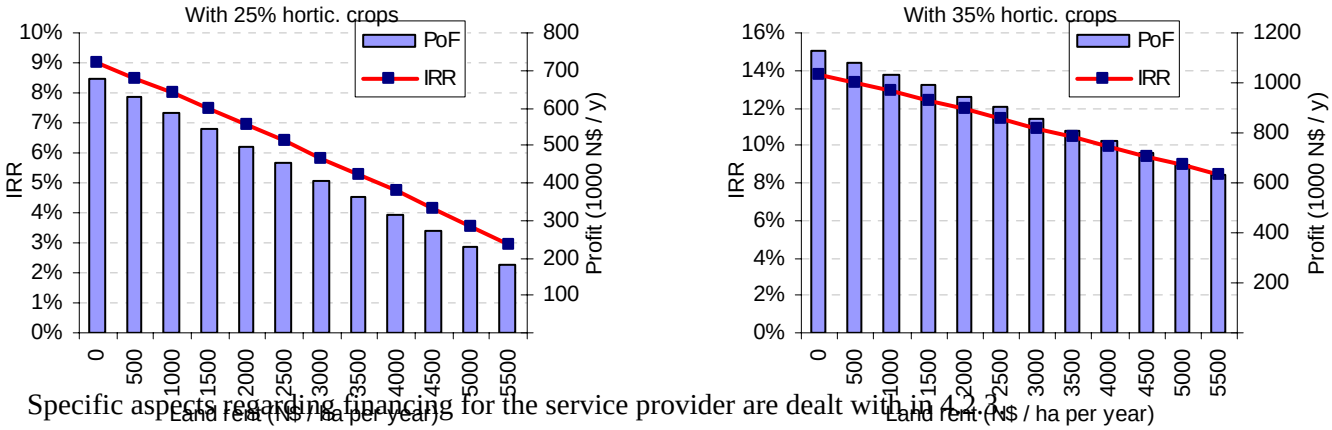
Proportion of hortic. crops		0%	10%	20%	30%	40%	50%
Total Gross Margin	N$/y	**924,000**	**1,494,625**	**2,065,250**	**2,635,875**	**3,206,500**	**3,777,125**
- Depreciation for fixed assets	N$/y	718,333	718,333	718,333	718,333	718,333	718,333
- Maintenance of fixed assets	N$/y	195,000	195,000	195,000	195,000	195,000	195,000
- Overheads (large scale)	N$/y	200,000	200,000	200,000	200,000	200,000	200,000
- Water costs	N$/y	0	0	0	0	0	0
- Wages paid	N$/y	228,000	299,000	370,000	441,000	512,000	583,000
- Interest paid	N$/y	41,629	42,648	43,667	44,686	45,705	46,724
- Rent paid	N$/y	0	0	0	0	0	0
- Profit share for RC, TA, PW	N$/y	0	35,798	85,658	135,519	185,380	235,240
Profit of farming	**N$/y**	**-458,963**	**3,846**	**452,591**	**901,337**	**1,350,082**	**1,798,828**
PoF excl. depric. for off-field infrastr.	N$/y	99,371	562,179	1,010,925	1,459,670	1,908,416	2,357,161
Internal rate or return (total capital)		-7.2%	0.5%	6.4%	11.5%	16.0%	20.3%
Net Present Value (total capital)	N$	-9,726,635	-5,503,067	-1,279,500	2,944,068	7,167,636	11,391,204

Source: Own calculations

Under the suboptimal conditions referred to above, a minimum of 23% horticultural crops cultivated would be needed to break even and reach the minimum of 8% for the return to total capital. However, based on the profit of farming excluding depreciation for subsidised off-farm infrastructure, even with pure grain crops a sufficient profit and internal rate of return can be gained.

Since the service provider is expected to pay rent for the land used (although there are no obligatory rates) a sensitivity analysis was carried out to evaluate this issue. In the case of only grain crops being grown and costs for the maintenance and replacement of the off-farm infrastructure being borne in full by the service provider, no money would be left to make rent payments. However, if 25% of the land was planted with horticultural crops, up to N$1 000 per ha per annum could be afforded. With 35% of the land used to raise horticultural crops, the rent could even be increased to N$5 500 per ha per annum before all profitability is lost. However, as the service provider needs to deduct some risk allowances, 70 to 80% of the maximum rent payments is probably more realistic.

Figure 4.4: Profitability of large scale unit (100 ha) according to rent payments



Specific aspects regarding financing for the service provider are dealt with in 4.2.2.

Analysis of one small scale unit (3 ha)

Once again, the same analyses were conducted for the 3 ha unit of a small scale farmer as for the complete farm unit. The suboptimal conditions as described above for the service provider are in fact to the benefit of the small scale farmer who shares off-farm and on-farm infrastructure (including machinery) without having to share the fixed costs they incur.

Table 4.5: Financial profitability coefficients for Green Scheme – small scale farmer (3 ha)

Proportion of hortic. crops		0%	5%	10%	15%	20%	25%
Total Gross Margin	N$/y	**15,780**	**27,217**	**38,654**	**50,090**	**61,527**	**72,964**
- Depreciation for fixed assets	N$/y	2,333	2,333	2,333	2,333	2,333	2,333
- Maintenance of fixed assets	N$/y	800	800	800	800	800	800
- Overheads (large scale)	N$/y	0	0	0	0	0	0
- Water costs	N$/y	0	0	0	0	0	0
- Wages paid	N$/y	2,000	2,115	2,230	2,345	2,460	2,575
- Interest paid	N$/y	754	768	782	797	811	825
- Rent paid	N$/y	0	0	0	0	0	0
- Profit share for RC, TA, PW	N$/y	0	0	0	0	0	0
Profit of farming	**N$/y**	**9,893**	**21,200**	**32,508**	**43,815**	**55,123**	**66,430**
PoF excl. depric. for off-field infrastr.	N$/y	9,893	21,200	32,508	43,815	55,123	66,430
Internal rate or return (total capital)		7.4%	26.9%	44.3%	60.8%	76.7%	92.1%
Net Present Value (total capital)	N$	-2,529	89,700	181,929	274,157	366,386	458,615

Source: Own calculations

Even without any horticultural crops, the small scale farmer earns a profit and some return on capital invested (almost reaching the hurdle value of 8%). Although this seems to be quite positive, it has to be carefully interpreted.

The profit earned represents the absolute minimum acceptable for a farming family and if anything were reduce this profit further, the income would become insufficient. For example, if fewer than two family members were available to work on the farm, labour costs could rise substantially. The wages displayed in the table above represent the costs for 20% of the labour requirements. Doubling this rate would double the costs. Furthermore, the high internal rates of return must be seen against the relatively small capital investment made (consisting only of the irrigation equipment and the working capital). As the IRR is a

relative figure, calculating output as a percentage of the capital investment leads to misleadingly high results.

Finance is another critical issue and is dealt with below. There it is shown that if a farmer farms with grain crops only, once the interest subsidy declines after the first three or four years, the farmer will not be able to pay the interest and instalments to the bank. This is not demonstrated by the above table since the *average* interest payments over 15 years are not problematic. However, they *are* a problem in certain years (which can only be seen in the dynamic analysis; see next chapter).

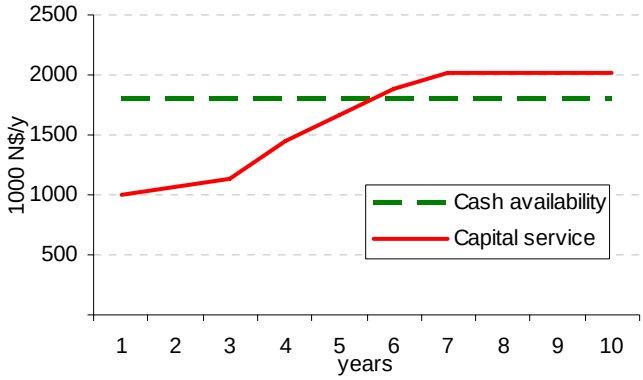
As soon as a farmer starts horticulture cultivation (even to a limited degree), his financial situation improves considerably. As a result, liquidity problems with payments to bank should become rare.

4.2.3 Finance

As stated above, the government, through the MAWF, funds the bulk infrastructure for the provision of water to farm gate. However, it is also possible that a prospective large scale farmer (service provider) could fund the off-farm infrastructure. If full private financing should be the case, the analyses regarding return to total capital invested (IRR) as dealt with in the previous chapter are relevant.

Government will also provide predetermined interest rate incentives and loan collaterals on long-term and medium-term loans, as well as on the farmer's bridging finance requirements. (For interest rates, see 4.1.3.1.) For this reason, the dynamic financial analysis includes a scenario reflecting external financing of the long-term investments and with short-term (seasonal) loans for the working capital.

Fig. 4.5: Capital service for a subsidized loan

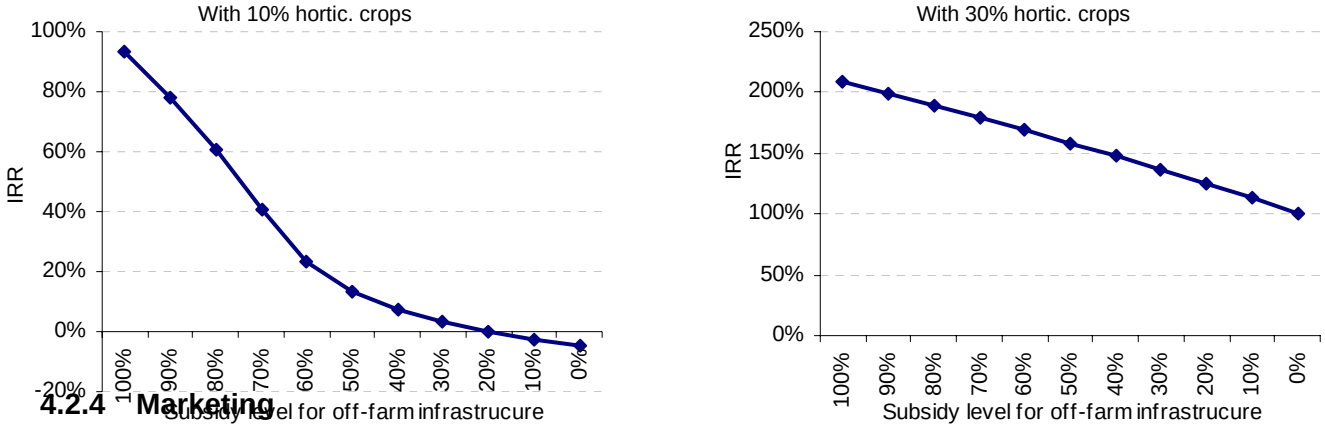


Should an investor want to develop a complete unit (200 ha) by himself using a subsidised 10-year loan , we have already established that a minimum of 10% horticulture crops are required to be profitable. However, with only 10% horticulture crops the investor will not be able to meet his or her obligations to the bank after the first five years when the interest subsidy declines. For this reason, a higher proportion of horticulture crops is necessary (at least 13%) to secure liquidity.

The same problem arises for the small scale farmer who cultivates only grain crops. Such a strategy is not only problematic regarding profitability; it will also lead to liquidity problems once loan subsidies decline.

It has been established that the service provider who decides not to grow horticultural crops will generate a negative internal rate of return. However, by using the subsidy for the off-farm infrastructure and the subsidised loans for his or her own long-term and short-term investments, the return to owner's capital will (thanks to the subsidies) exceed the hurdle value of 8%. The higher the direct subsidy for the off-farm infrastructure, the higher the return to owner's capital. However, the resulting internal rates of return have to be interpreted carefully since the amount of owner's capital invested decreases considerably with higher subsidies.

Figure 4.6: Return to owner's capital (IRR) for SP (100 ha) according to decreasing subsidy level



4.2.4 Marketing

As shown in the financial analysis above, those crops with established, straightforward marketing methods such as maize and wheat are unfortunately not the crops which promise sustainable profitability.

On the other hand, crops with higher profitability potential such as vegetables and fruits have no marketing channels from farm gate at present. The Etunda example, in which small scale farmers are marketing their vegetables individually through the local markets in the villages and towns within a radius of more than 100 km, may be a good starting point, but this is inadequate for a larger number of projects.

Especially for high value crops (which usually implies high quality products), ways to market produce of small scale farmers *and* service providers must be developed. Cooperatives of small scale farmers could be one possibility for small scale farmers, but for goods that are produced by small and large scale farmers, and for goods that are sold to larger food companies or even exported, a common way of marketing their goods would be most advantageous. Clearly, since such production and marketing has not yet been established, it could not be evaluated during this study. However it is strongly advised that such studies be carried out as soon as possible, preferably with assistance of the Namibia Agronomic Board.

One benefit for the future must be mentioned. According to information received from the Namibia Agronomic Board, from October 2006 all Namibian food importers must buy a certain quota of Namibian-produced food in order to obtain an import license. This is clearly an opportunity for all local food producers, but time will tell which types of food are preferred by the importers.

4.3 Economic analysis

4.3.1 Costs

For the economic analysis, the costs of the project were determined on basis of the financial calculation. For all items that include Value Added Tax (VAT), 15% in 2006, the VAT was excluded from the calculation. For all internationally tradable items, a foreign exchange premium of 6% was added to the costs.

For the economic opportunity costs for labour, a rate of 20% of the financial costs was used, allowing for the high rate of unemployment in the country and also for the fact that labourers on the analysed farms were usually unskilled. For the economic opportunity cost for the labour input of the service provider, a rate of 70% of the financial costs was used. The economic opportunity costs for land were determined at a

rate of 10% of the rental fee for the land, accounting for that the land used has no (or little) opportunity costs for the economy. (Note: in the base scenario no land rent is included.)

All adjustments were discussed amongst the consultancy teams as well as with a local consultant from the Ministry of Environment and Tourism (Jon Barnes). An explanatory statement for all adjustments made is attached in Annexure 2. Finally, the economic costs for a 200 ha unit were determined as follows:

Table 4.6: Economic investment costs for developing a 200 ha unit under the Green Scheme

	Financial costs (N$)	Conversion Factor	Economic costs (N$)
Off-field infrastructure (provided by gov.)	9,125,000	0.922	8,410,870
On-field infrastructure (provided by SP/SSF)	4,420,000	0.922	4,074,087
Total	13,545,000		12,484,957

*) Conversion factors: VAT adjustment factor 0,87 (=1/1.15) AND Foreign Exchange Factor 1,06

4.3.2 Benefits

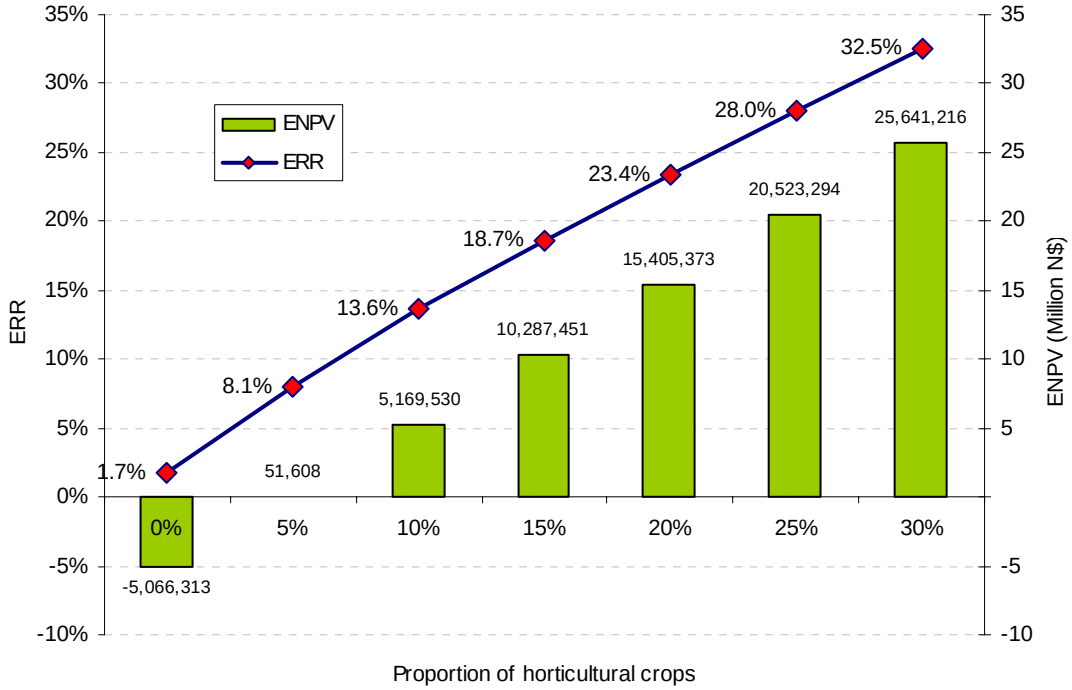
For the economic analysis, the benefits of the project are derived from the financial calculation (as were the costs). As for the costs, conversion factors were used to determine the economic value of the produced goods. All produced goods have been regarded as internationally tradable: a VAT adjustment factor of 0.87 [= 1/1.15] and a foreign exchange premium of 6% were applied.

The economic analysis includes the benefits for all stakeholders: small scale farmers, service providers, regional councils, traditional authorities and permanent workers.

4.3.3 Economic viability

In order to allow a differentiated evaluation, the economic analysis was carried out on the basis of the “complete unit” scenario (service provider + 32 farmers on 200 ha) using the same variations regarding the proportion of horticulture crops as used in the financial analysis. The resulting economic rate of return and the economic net present value of the project variants are displayed in the diagrams below:

Figure 4.7: Economic rate of return and economic net present value



Source: Own calculations

Due to the positive effect of the conversion factors, the economic results appear even more advantageous then the financial results. By the time 5% of the land has been used for horticultural crops, the hurdle value of 8% for the economic rate of return is exceeded and the economic net present values rise above zero. However, once again the diagram shows clearly that the exclusion of high value crops and orientation towards standard grain crops alone is not economically viable.

Looking at the rates of return for the higher proportions of horticulture crops, one should bear in mind that a selection of crops was chosen from the broad variety that can be grown (and are grown, for example, in Etunda). Therefore, the higher values in the diagram should not be regarded as hard figures but rather as a clear trend that underlines the need for orientation towards high value crops under the Green Scheme initiative.

4.3.4 Socio-economic impact and external effects

The socio-economic impact and the external effects of the Green Scheme initiative will very much depend on the final produce orientation. Should standard crops like maize, wheat and beans be grown, the socio-economic impact and the external effects will be limited (as will farm profitability), since job creation and fiscal benefits will not reach the anticipated levels. However, with the successful introduction of high value production, considerable socio-economic and external effects may be expected. Since a detailed evaluation of these effects would go far beyond of what could be done within the limited timeframe of this study, at this point reference is made to the PriceWaterhouseCoopers study of 2005, in which the authors estimated more than 6 700 additional permanent employment positions and almost 23 000 additional part-

time positions created by 27 000 ha of additional land intended for development under the Green Scheme initiative. This estimate still seems cautious – considering the models developed for the financial and economic analysis, the job creation could even be considerably higher.

A material characteristic of the Green Scheme initiative is that the service provider must share any profit with the relevant regional council (2.5%), the traditional authorities (5%), and the permanent workers (2.5%). Whilst only of benefit if sufficient profit is generated, with the cultivation of high value crops a substantial impact may be expected.

The removal of water from the rivers is a significant environmental result of the project.. The Department of Water Affairs has identified water abstraction potential from perennial rivers for irrigation as stated above (see 4.1.5). In the *Information Document for Prospective Developers* for the Ndonga Linena Scheme (attached as Annexure 4), it is stated, "No environmental study on the specific project was undertaken. Wild life is virtually non-existent. A number of studies on the river were conducted in the past. The only factor that seems to be of significance is the abstraction rate of water during low-flow conditions during the hot summer months of October to December, when irrigation demands are at a high. According to a policy issued by the Directorate of Resource Management of the MAWF, the intended project is still within limits."

4.4 Constraints and recommendations

Based on the analyses above, the major keys to success and viability (financially and economical) are the following:

- Cultivation of high value crops
- Appropriate marketing
- Suitable financing and subsidising
- Target-oriented training of the small scale farmers

High-value crops

Both, the financial and the economic analyses showed clearly that an orientation towards high value crops is essential for the successful implementation of the Green Scheme initiative. However, it has to be repeated that looking at the high rates of return for the higher proportions of horticultural crops cultivated, only a selection of crops was chosen from the broad variety that can be grown. Therefore, the high internal rates of return should not be taken too literally but should rather be interpreted as an indication of the clear trend towards the increased profitability of high value crops under the Green Scheme initiative. Since training of the small scale farming applicants has already started and the first schemes are ready to begin, it is strongly recommended that appropriate high value crops be identified for planting at the planned sites – both by agronomic and financial analysis, and by conducting trials in different agro-ecological zones.

The financial analysis indicated that it would be dangerous to start with standard crops and merely experiment with fruit and vegetables for a few years. Whilst this may be profitable for the first few years, once the subsidised interest on loans falls away, if no high value crop cultivation is established, projects are endangered to fail purely due to liquidity problems.

Marketing

As already discussed above, no marketing channels from farm gate exist at present for the high value crops that are regarded as essential for the Green Scheme initiative. In Etunda, small scale farmers are individually marketing their vegetables through the local markets in the villages and towns. This may serve as an example for starting off, but joint ways to marketing the produce of small scale farmers and/or the service providers have to be developed, especially for high value crops (which usually demand a high quality standard of the products). Since marketing through the service provider will not be possible for all crops produced, it is strongly recommended that small scale farmers are assisted in forming marketing cooperatives and that marketing studies are carried out as soon as possible, preferably with the assistance of the Namibia Agronomic Board.

Financing and subsidising

The present system of subsidies and financing offers good opportunities for interested service providers and small scale farmers. It is crucial that such incentives exist to attract potential service providers. However, they do not address the considerable imbalance between service provider and small scale farmer regarding the costs of farming. The service provider has to bear high costs that benefit both the service provider and the small scale farmers: the maintenance of the off-farm infrastructure and the fixed costs for the machinery.

The rates paid by small scale farmers for mechanisation services (N$13 to N$14 per litre of diesel) at the sites visited (Shadikongoro and Etunda) only cover the costs for the fuel and the maintenance of the machinery – they are not sufficient to cover the capital costs. For a service provider, who has to buy the machinery, this is a substantial burden. It is therefore strongly recommended that a way be found to share costs for shared equipment, like an updated calculation for the mechanisation service rate, or even the payment of a monthly amount by the small scale farmers for the land and the infrastructure.

Training

Two types of training for small scale farmers are envisaged under the Green Scheme concept: pre-start training at the Mashare Agricultural Development Institute (MARDI) and on-the-site advice given by the service provider who should act as a mentor.

Nothing can be said of the second option: there are as yet no examples in existence. However, at Shadikongoro and Etunda, the relationships between service providers and small scale farmers are not those envisaged by the Green Scheme policy since they are characterized by *directing* rather than guiding or mentoring small scale farmers in their farming activities. However, some farmers do make use of the opportunity to ask for assistance when problems occur.

The MARDI curriculum was made available for this study and is attached as Annexure 4 on the CD. The curriculum is quite comprehensive; however, two areas require more development.

Since the production of fruit and vegetables must play a major role in the Green Scheme, it seems advisable to place more emphasis on this in the curriculum. The special requirements and production practices for *individual* horticultural crops should be documented in detail so that the farmers will have something like a reference book for their later practical work.

The second issue is related to farm management. The curriculum contains quite comprehensive sections on record-keeping, profit and loss calculation, financing, etc. However, documentation should always be a tool for decision-making for the future. If a small scale farmer is meant to be a self-responsible entrepreneur he or she needs knowledge and tools to implement. In order to enable the farmer to take decisions about what to plant (and how to plant it) on basis of the documented experiences from the past, it is essential to develop and teach an easy-to-use gross margin analysis system that allows costs and revenues to be assigned to a specific crop on a specific plot in a specific season so that the records can be used not for documentation as well as for planning and decision-making.

5 ANALYSIS OF COMMUNAL CONSERVANCIES

By
Joseph Grimm
Michael Humavindu

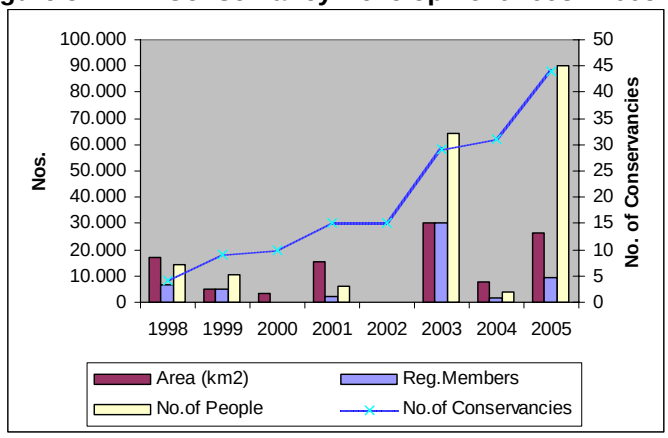
5.1 Background

5.1.1 Objectives of the programme

By the time of the 1980s drought, uncontrolled hunting and poaching had reduced Namibia's wildlife considerably in communal areas, particularly in the Kunene Region (north-western Namibia). The government was responsible for the management of this resource, though local communities bore the brunt of living alongside wildlife without reaping any material benefits. To remedy the situation and in cooperation with the Department of Nature Conservation and some NGOs, local leaders started an initiative that led to the appointment of community game guards. This involvement of the broader community resulted in a dramatic reduction in poaching and subsequently led to an unprecedented increase in wildlife in this area. Game counts based on aerial and road count surveys suggest that the number of elephant and black rhino in Kunene has doubled in the last 20 years, while springbok, oryx and mountain zebra populations may have seen a tenfold increase over the same period.

Today, community-based natural resource management (CBNRM) in Namibia aims to allow rural communities to participate actively in the management and utilisation of their local natural resource potential. The concept of communal conservancies (CC) provides especially for the use of wildlife in a given area. This is based on the assumption that the gain from managing and utilising wildlife sustainably, outweighs the costs of an increased wildlife presence in the respective local environs.

Figure 5.1: Conservancy Development 1998 - 2005



Consumptive-use rights provide for conditional ownership allowing for game to be hunted as trophies, used for consumption by conservancy members, culled for commercial sale of meat, or captured and sold as live game. Non-consumptive rights over wildlife include the exploitation of the CBNRM-potential for tourism through joint venture agreements with private sector entrepreneurs or community-based tourism enterprises (CBTE).

By the end of 2005, the 44 registered communal conservancies covered more than 105 000 km² of land, which represents about 41% of Namibia's communal areas. These communal conservancies are home to about 190 000 people who largely depend for their livelihoods on the use of this land resource for their livestock and arable enterprises. Benefits accruing from conservancies complement local incomes, but do not represent a major pillar of the livelihoods in those areas.

Objectives of Communal Conservancies "…**for the sustainable management and utilization of game in such area**;…."
Nature Conservation Amendment Act (1996) Section 24A 2b.

Objectives of communal conservancies "…**for the sustainable management and utilization of game in such area**…."
Nature Conservation Amendment Act (1996) Section 24A 2b.

The conservancy programme in Namibia is implemented through partnerships between different levels of government, non-governmental organisations (NGOs), the private sector and rural communities.

5.1.2 Guiding policies and strategies

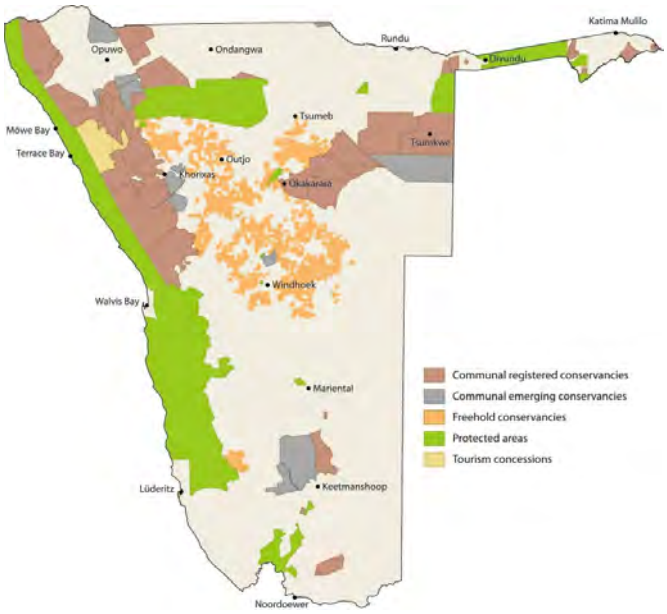
The Nature Conservation Amendment Act, Act 5 of 1996, provides the legal basis for communities to form "common property resource management associations" called "conservancies". This Act provides for an "economically based system of sustainable management and utilisation of game in communal areas". Once established, the members of a conservancy gain the limited right to consumptive and non-consumptive use of the wildlife in their respective conservancy on the basis of their MET-approved management plan. All income earned goes directly to the conservancy. This particular legislation puts communal areas largely on a par with freehold landowners who have enjoyed economic benefits from the game on their respective farm land.

The establishment of conservancies has substantially contributed towards the achievement of the broad development goals aiming to create mechanisms that protect and guide the sustainable use of the country's

natural resources. In the process, a sustainable wildlife habitat is preserved and communities have the opportunity to derive some direct benefits through consumptive and non-consumptive use of wildlife.

CBNRM is now firmly entrenched in Namibia's national development plans and poverty reduction strategies, and conservancies were explicitly named as one of several rural development strategies in NDP1 & 2 as well as in Namibia's Vision 2030. In placing poverty reduction high on its development agenda, the Namibian government formulated the National Poverty Reduction Action Programme (NPRAP).

Figure 5.2: Extent of Namibia's conservation areas



The CBNRM concept is based on three pillars. Decisions on land use are primarily founded on the following principles:

(a) Economic principles rather than conservation. "Investment" in a conservancy is not based on direct financial contributions by individual member households, but rather on the acceptance of land management practises that restrict individual land use. It is therefore critical that the perceived advantages for the individual and the community as a whole exceed the perceived disadvantages.

(b) Devolution of decision-making on resource management represents a new concept in southern Africa where authority over wildlife has always been vested in the central government.

(c) Collective ownership where a group of people (community) are given sanctioned use of resources which they can use according to their own rules and strategies.

Figure 5.2 depicts the spatial extent and distribution of land under conservation management. By the end of 2005, communal conservancies covered 13% of Namibia. National parks and game reserves (inclusive of the soon-to-be proclaimed Sperrgebiet National Park) account for 16.5% of Namibia's surface area, while a further 6% of the country is registered as freehold conservancies, totalling 35% of the total land surface under conservation management.

Given the great importance of communal conservancies with regard to their scope and scale in the broader CBNRM strategy, it is important to strengthen these often still-fragile structures. In practise, the formulation of the relevant Act is, in parts, ambiguous on issues that have an important bearing on the successful and sustainable establishment of CCs:

- **Conservancy committees:** The Act stipulates how such committees are accountable upwards towards the MET, but does not spell out any principles and requirements for the election of committee memebers or their accountability to their respective communities.

  Implementation experience shows that the constitutions initially drawn up during the registration phase to regulate the duties and functions of the management committee do not always address the

needs of the communities and are later adjusted to the actual needs and conditions of a CC. Spatial aspects of representation giving different villages in a CC a voice on the committee proved to be an important element in the effective implementation of land use plans for many conservancies.

- **Membership:** The Act does not spell out the requirement for formal "membership", but continuously refers to "members of the community" (24A - 2[c] and 24A - 4), "suggesting" the whole community. Therefore implementation practices vary widely amongst conservancies with regard to the percentage of the population who are CC members. For example, Uukwaluudhi (100%) and Sheya Uushona (5.6%) demonstrate the two extremes; whereas Salambala (45.5%), ≠Khoadi -//Hôas (50%), Torra (37.5%) and Nyae Nyae (33.5%) have adopted the principle that all members of the community above the age of 18 are automatically members.

CC establishment : The Minister of MET will declare a conservancy on the following conditions:
- Application from the community submits the names of the elected committee.
- Community has agreed on a legal constitution providing for sustainable use and management of the wildlife in the conservancy.
- The elected committee has the ability to manage funds.
- The committee has an approved method for the equitable distribution of benefits to its members form consumptive and non-consumptive use.
- The community has defined the boundaries of the geographic area of the conservancy.
- The area identified has not been formally dedicated for any other use.

  Issues of membership versus residence in a conservancy are of relevance when sharing income and other benefits of the CC. Furthermore, it is essential for the whole community to be involved when deciding on a land use plan or a management plan. On the other hand, many of the benefits target the wider community such as support to schools and the establishment of water points, and it would be impossible to distinguish between members and non-members in the utilisation of such facilities.

- **Management:** MET's interpretation of its role in conservancy management is in some cases wider than the Act would suggest, such as the ministry not only issues the quota for trophy hunting but also stipulates the number and species for "own use hunting" and also grants permission for tourism development. This may be justifiable as CCs have little experience in taking full management responsibility for their whole resource base, but as committees and the conservancy population grow into their role and gain experience, the functions of MET could gradually be reduced to the function stipulated in the Act (quotas for trophy hunting) and assume an advisory capacity in all other aspects.

5.1.3 Implementing agencies

5.1.3.1 Provision of financial support

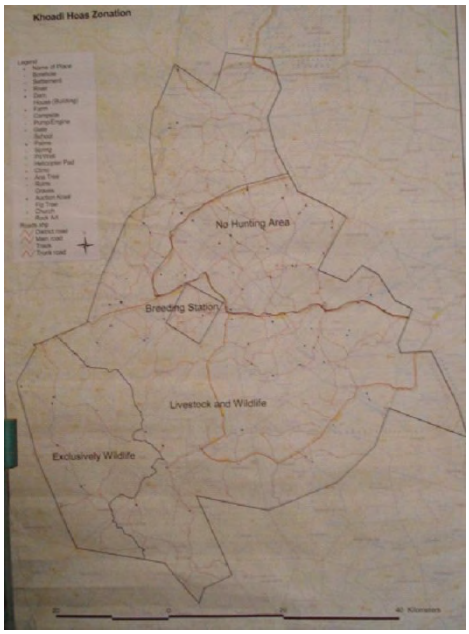
The formal support to the introduction and the establishment of the communal conservancy programme started in 1990. Since then total programme spending by the GRN and various donor agencies amounts to over N$680 million. However, most of this support reached the respective communities in the form of services and in kind.

Since 1999, game to the value of N$8 million has been introduced to the area. A total of 2 913 animals were introduced between 1999 and 2005 to the following conservancies: Nyae Nyae (2 114 animals), Uukwaluudhi (301), Salambala (308), ≠Khoadi-//Hôas (50), Mayuni (26), Ehirovipuka (36), Oskop (48) and Tsiseb (30 animals). Altogether, 12 different species were provided in order to add to or establish nucleus breeding units in the respective areas.

Another type of financial support is the GRN contribution to the Human-Animal-Conflict Conservancy Compensation Scheme (HACCCS), which aims to insure individual conservancy members against stock losses. In this second phase, however, most conservancies now pay 50 % the claims out of their own funds. In a future phase, the insurance scheme will be extended to cover crop damage as well.

5.1.3.2 Provision of technical support

Figure 5.3: Land use plan ≠Khoadi-//Hôas



Most of the support was given by local NGOs through the Namibian Association of CBNRM Support Organisations (NACSO), the University of Namibia and individual associate members. The multi-level support over the years included some feasibility investigations, but centred mainly on the following components:

- Capacity-building of community (local governance) in management and administration of conservancy committees and their staff;
- Improved local-level planning and resource management;
- Support for enterprise development, especially to generate income from tourism.

Development objectives for each of the communal conservancies must be outlined in a management plan. At the heart of such plans are zone maps indicating which type of land use is to be practised. Most CCs designate exclusive wildlife areas and areas where wildlife mixes with the conventional land use systems (see Figure 5.3). Such zones[3] can also help to reduce human-wildlife-conflict.

In addition, these plans are supposed to spell out how natural resources will be managed, how enterprises are created and run, and how the conservancy is administered (staff employment, controlling the use of vehicles and equipment, etc).

Thirty-one conservancies have now developed and implemented comprehensive management plan frameworks, compared with seven conservancies in 2003. The frameworks include an institutional structure (organogram), a zone plan for different resource management zones, and planning tools and policies that will enable the conservancy to achieve its set goals. This framework has been adapted by conservancies in different parts of the country to suit local needs.

[3] There was a substantial reduction in incidents of crop damage by wildlife in one of two neighbouring conservancies (Mayuni and Kwando) which was largely attributed to the implementation of a zone plan at Mayuni, which led to the relocation of people away from the Kwando River floodplains. While this issue requires further investigation, it suggests that the implementation of land use plans is a key strategy for reducing incidents of wildlife damage.

5.1.4 Institutional environment

Traditional authorities, as the customary custodians of the land, are in most cases at the centre of the conservancy formation, and CCs are often designed along the boundaries of the area of jurisdiction of the local king or chief. In some cases, this leads to conservancy designs that do not necessarily constitute sustainable economic and ecologically suitable management units, as game populations may roam in larger spatial units.

Communal conservancies are declared by the Minister of Environment and Tourism and the respective committees are registered if they demonstrate their ability to perform their respective functions and if a management plan has been submitted and approved.

Land boards are now critical to the establishment of communal conservancies, as they must approve the dedication of land for any formal land use system. Once approved, such a registration protects the community's plans against other developments that could jeopardise the conservancy approach.

In addition to the government, NGOs have played a key role in developing the conceptual approach, building capacity of conservancy personnel, and hands-on management support. Such support will still be required in the foreseeable future. The formation of NACSO represents a major step forward in the MET's efforts to have conservancy development driven forward as a national initiative, with the contribution of different donor organisations.

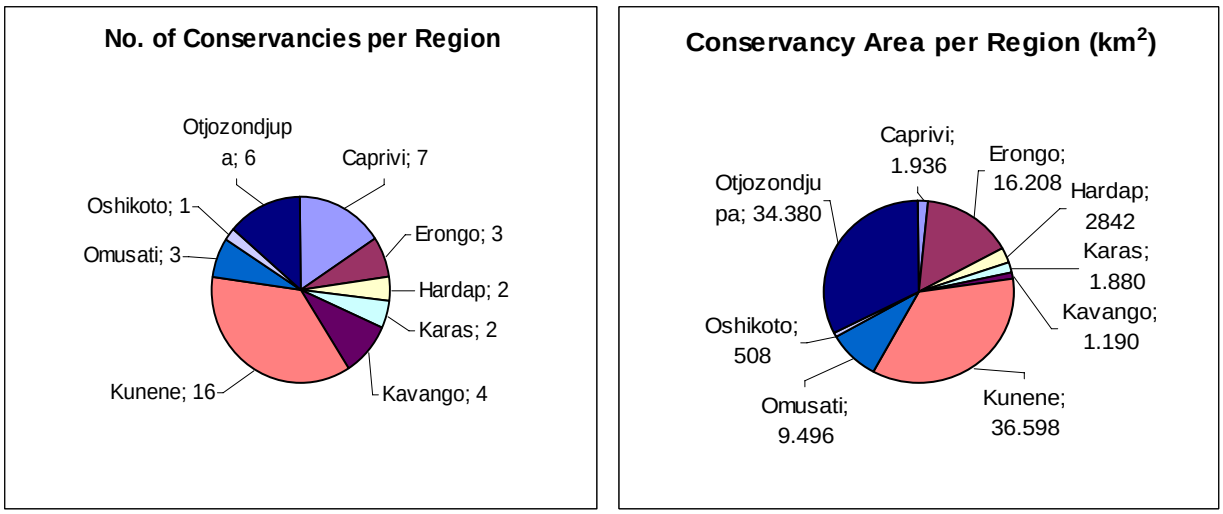
Cooperation with the private sector yields the lion's share of conservancy income, so the private sector is a major partner in the successful development of conservancies. This includes umbrella organisations of the tourism and the professional hunting industries, as well as the individual companies in the respective economic sectors.

5.1.5 Selection and characteristics of sites

The concept of communal conservancies evolved from the successful experiences with the communal game guard system and led to a marked increase in wildlife numbers over the years, especially in Kunene. The initial selection of sites for conservancies focused on areas with high wildlife concentrations and/or outstanding scenic beauty. But since the registration of the first communal conservancies in 1998, the concept has grown into a major nationwide CBNRM initiative with communal lands in several regions covered by wall-to-wall conservancies (see Figure 5.2 above).

CCs vary considerably in size from 36 km² to 9 120 km² and with a resident population ranging between 120 and 35 360 people. The land per person in a conservancy is another parameter that offers insight into the distribution of possible benefits; with a spatial spread of between 3 ha per person to 1 372 ha per person.

Figure 5.4: Conservancy development - Status 2005



The rapid expansion of the conservancy programme over the last few years has also led to a critical analysis of the viability of the many communal conservation sites. Support organisations have agreed on a formula for financial support and therefore classified the CCs in terms of their income-earning potential and biodiversity value:

- **Fast-track** conservancies expect to be self-reliant in less than five years.
- **Medium-track** conservancies supposed to be self-sufficient in about five years.
- **Slow-track** conservancies will not become self-sustaining, but the area has high biodiversity value.

There is great variation between the different conservancies in terms of their wildlife, agricultural use and population density.

The agro-ecological conditions predetermine the prevailing land use system which also impacts on the characteristics of the conservancies. In the eastern Caprivi and in the north of the country, adequate precipitation allows for mixed farming to meet some of the subsistence requirement of the households. Most of the area in the north and north-east is also covered by bush and forests of varying densities and potentials.

5.1.6 Existing financial and economic data and publications

There is a considerable amount of literature available on the design, management and impact of conservancies on participating communities and the wildlife. Various NGOs, coordinated by NACSO, continue to monitor conservancy progress very closely.

The MET, through its economics unit in the Directorate of Environmental Affairs, has continuously analysed conservancy progress and projected impact with regard to income and costs of the initiative for the beneficiaries, and the economic impact at national level. Rarely has a government department succeeded in galvanising so much national and international research into such a topic.

In addition, several studies were undertaken, one of the most comprehensive being the “WILD” Report of 2004. It provided the most wide-ranging view of the impact of communal conservancy on the intended target group.

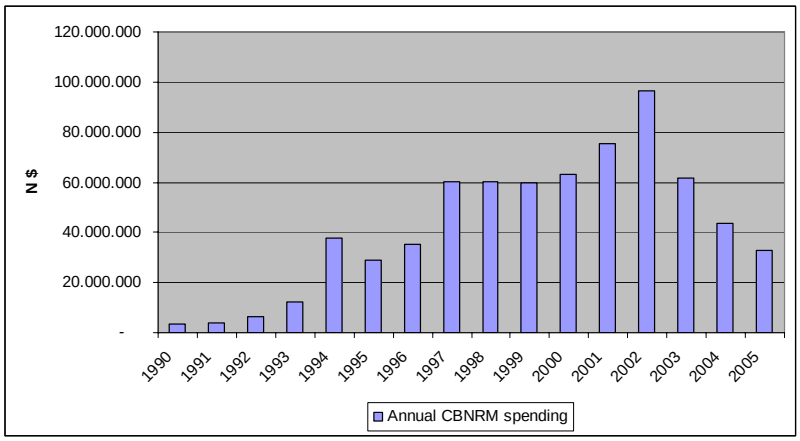
The various topical studies and the investigations could provide important insight into the progress made.

5.2 Financial analysis

5.2.1 Investment costs

Conservancies have not incurred any investment costs for their own establishment, as there has been wide support across large sections of the donor community for development of conservancies. Most of the investment reached the community in the form of capacity building and concept development. There are no data available on how much support was given to individual CCs.

Figure 5.5: Total CBNRM expenditure for conservancies



Drought and poaching had depleted game stocks in many potential conservancy areas. It was therefore decided to support newly established conservancies by providing different game species to build up dwindling herds and in some cases to reintroduce new species to increase diversity and enhance the attractiveness of the area for tourists. The total value for the introduction of certain game species in selected conservancies was in excess of N$8 million.

Spending for CBNRM peaked in 2002 but seems to be petering off now. There are still another 26 communities preparing to have all or part of their land declared conservancies. These communities will require similar (or even more) financial and technical support.

In the past, the private sector invested in lodges. In many cases, these operators had obtained the permission to operate in a given area before the conservancies existed. In such cases CCs benefit through the employment of local people, but conservancies are in a weak position to renegotiate a greater share in the profit.

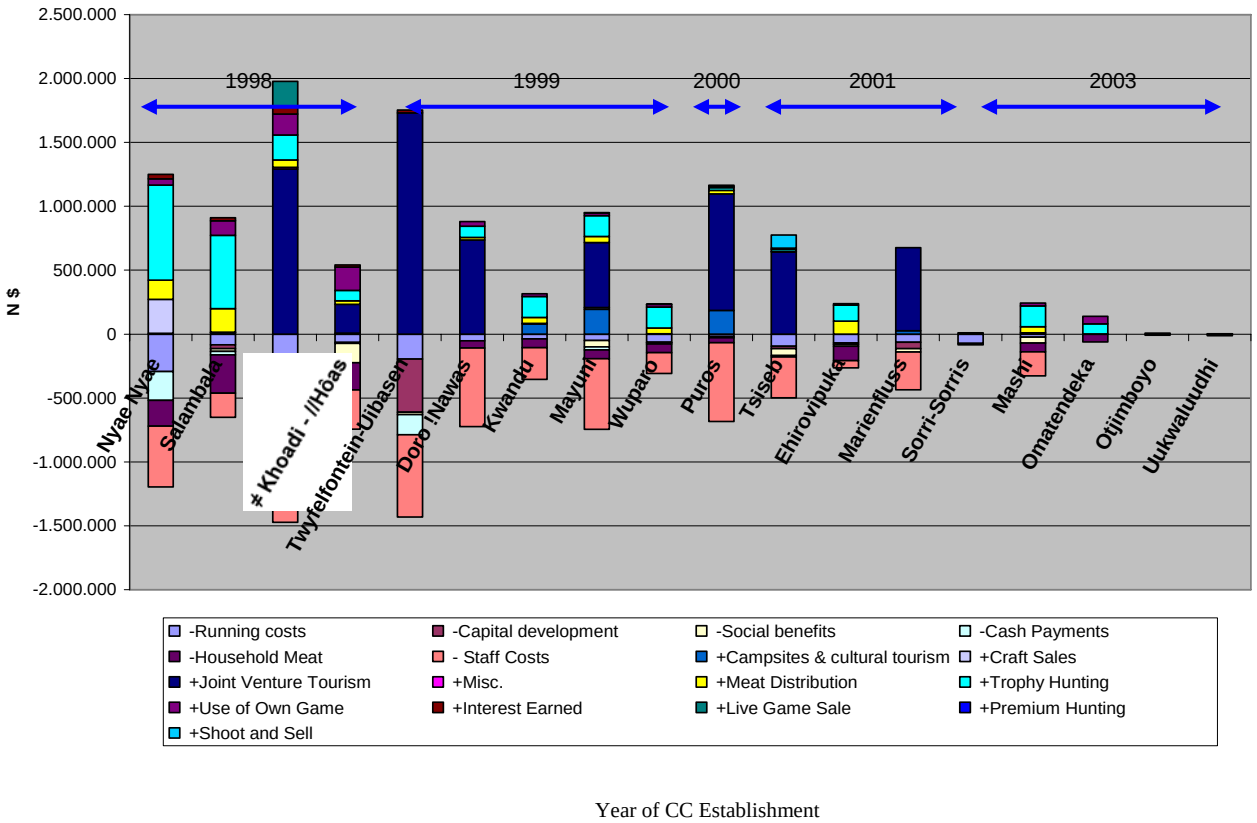
There are cases where donors have invested in the construction of a lodge and donated the lodge to a conservancy, such as at ≠Khoadi-//Hôas. At this stage, a donation by a financing institution seems to be the only option for a conservancy to own such a facility.

5.2.2 Financial viability

Namibia has embarked on a massive drive to establish 44 conservancies across the country. Given that the concept was very new to implementers as well as to communities, this is still a comparatively short period of time during which these rural institutions have become operational. It was always accepted by the planners that only a small percentage of conservancies would have the potential to generate enough income to meet their own expenses and contribute to the development of their respective communities.

Fast track conservancies are supposed to be financially independent within five years. Figure 5.6 gives an indication of income and expenditure patterns for different CCs. The diagram reveals that conservancies with joint venture tourism enterprises account for most of the high-income entities; experience has shown that 57% of all conservancy income in 2003 stemmed from this source. It also indicates that such undertakings represent a longer-term investment and therefore provide some financial security to the respective community. Figure 5.6 further suggests that most of the older CCs are achieving higher margins of income, which could indicate that conservancies require close to five years to realise the full potential of their area's resources.

Figure 5.6: Income and expenditure patterns for 18 conservancies in 2003



Income from hunting is a major budget item in 14 of the 18 CCs (see Figure 5.6 above). Contracts with professional hunting companies are usually negotiated on two- or three-year basis. In 2003, these conservancies earned a total of more than N$2.5 million; seven conservancies had contracts ranging from N$160 000 to N$700 000.

It has become apparent, however, that the process of allocating quotas for trophy animals to conservancies requires close monitoring: in some cases, the quota was set too high, suggesting the presence of more tro-

phy animals in a given area than were actually present. As a result, the hunter and his or her clients did not find the required trophy animals in the conservancy area and this led to legal disputes and the adjustment of contracts. It is recommended that quotas be set at a level that can be maintained over a period of years. Conservancies base expenditure on anticipated income, and budgets are usually limited. Staff, a conservancy's largest single expense, will have been employed, and such events cause conservancies to spend in excess of their income or to lay off employees. Few CCs are able to build up financial reserves to buffer future income fluctuations and such fluctuations need to be communicated well in advance.

Joint venture tourism lodges and camps in which conservancies negotiate a levy or income sharing agreement are by far the most important source of income. During 2005, a total of N$7 643 943 was earned from these ventures, representing 56% of all conservancy income. At the end of 2005, there were ten formal joint venture agreements generating income for conservancies and there are currently 13 potential joint venture agreements under negotiation. Another six conservancies received income from operators for traversing or resource utilisation. In the same year, trophy hunting concessions represented the second highest source of income for conservancies, generating N$3.6 million. By the end of 2005, 12 concessions extending over 16 conservancies had been allocated to professional hunters. A further five conservancies have approved trophy quotas and have entered into agreements with private sector hunters in 2006.

These are very positive trends and such steady sources of income lead to self-sustaining conservancies. In 2005, eleven conservancies were self-funding and another six made substantial contributions towards the cost of their operation. The impact at a national level is also impressive. In 2005, Namibia earned nearly N$140 million from CBNRM activities.

5.2.3 Financing

Since the launch of the programme, most finance has been provided either by the government or by donors on a grant basis. Investments in tourism infrastructure are financed by the private sector partners; conservancies do not raise any capital of their own.

Conservancy operations are normally based on a constitution that has the sustainable utilisation of game as its central objective and this is recognised by the Minister of Environment and Tourism. Unlike a cooperative, t is doubtful whether such recognition gives a conservancy the legal status to engage in financial business transactions.

5.2.4 Marketing

Marketing presents a challenge to conservancies. It is left largely to support organisations to market hunting opportunities through various channels. Tourism enterprises are nearly exclusively marketed through PPP-partners and their respective networks.

Usually, conservancies that derive a substantial income from tourism benefit from scenic or cultural features of their area – not the wildlife. In other cases they are conveniently placed along the major tourism routes such as the roads to Swakopmund or Etosha and provide convenient stop-over points, usually only for one night. Some CCs are busy developing and marketing special features such as game or nature walks and rides in order to attract bookings a second night or longer. The newly established Grootberg Lodge (≠Khoadi-//Hôas) markets itself internationally unambiguously as a Communal Conservancy Lodge, an innovation that deserves close monitoring for adoption by other CCs.

5.3 Economic analysis

5.3.1 Costs

The expenses incurred by communal conservancies fall into the following categories*:

(a) Salaries to employees (managers, administration, game scouts – on average 56.8% of all expenditure).

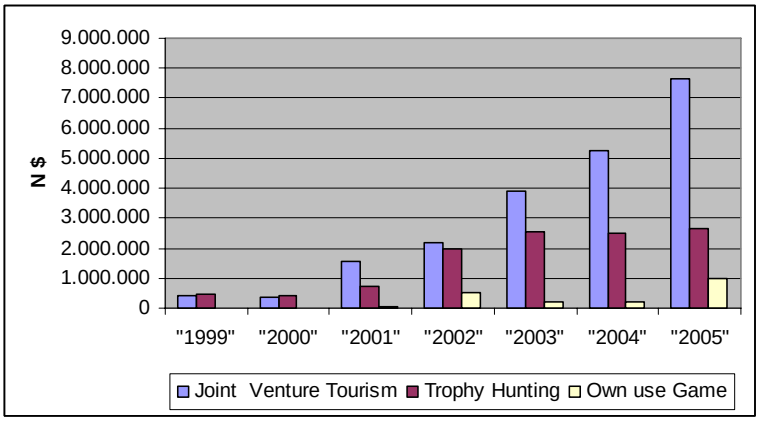
(b) Household meat accounts (15.1%).

(c) General running costs (13.5%).

(d) The remaining costs comprise cash payments to member, social benefits and capital development costs.

*Breakdown is based on 18 conservancies and their expenditure pattern in 2003.

Figure 5.7: Major income sources for conservancies



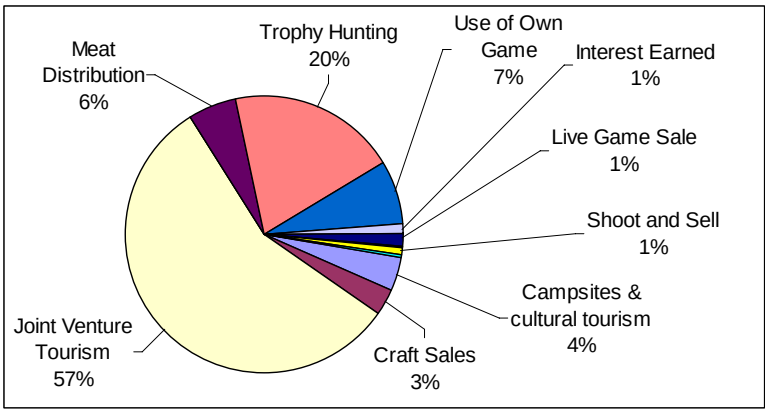
5.3.2 Benefits

Conservancy level

In 2005, conservancies earned more than N$13.7 million in income. As Figure 5.7 indicates, the major income streams are joint venture tourism, trophy hunting, and own use of game.

The increase in income has come from the continuous and increasing expansion of joint venture tourism throughout the conservancies since the establishment of the CCs. The growth of this sector is benefiting from general growth in the tourism sector during the same period. Nevertheless, it is impressive how new ventures seem to establish themselves in a very competitive market. However it should be noted that the lion's share of the so-called "income" from joint venture tourism is actually the salaries of local people employed at the lodges. Whilst this is highly commendable, it does not materially benefit the broader public in the CC.

Figure 5.8: CC income sources 2003



Trophy hunting appears to have levelled off over the last three years. During the field visits, conservancy management reported that quotas for elephant, for example, had been drastically reduced in the Kunene. In the Caprivi, some conservancies found it difficult to fully utilise their quotas, especially with regard to buffalo, as professional hunters did not seem to find the required trophy animals. Trophy hunting provides a conservancy with cash for rentals and royalties, wages for people employed during the hunt, and benefits such as meat.

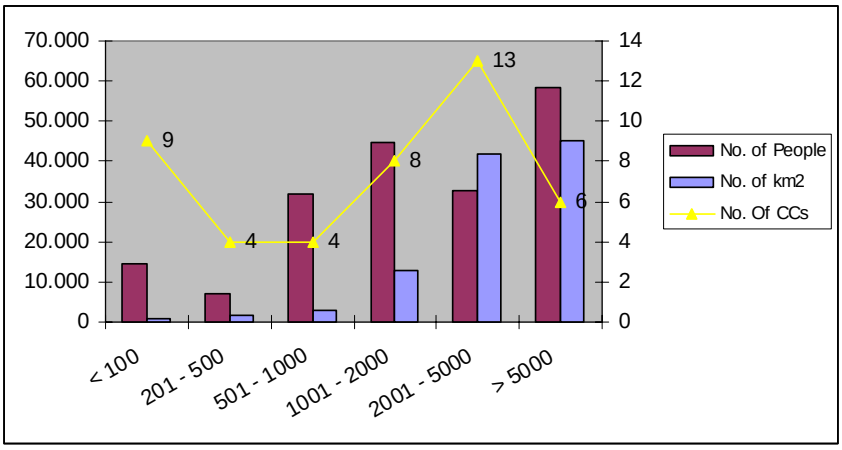
During 2005, a total of 21 conservancy members received meat and skins from animals that had been allocated as quotas for the conservancy's own use. This was a marked increase from the 11 conservancies that benefited in this way in 2003. In addition, the members of 16 conservancies received meat from trophy hunting in their areas.

Household level

Most benefits accruing from conservancies are not being passed on to the individual member households. There are currently several different approaches to distributing benefits to the wider community:

- Cash payouts are only made in Nyae Nyae where 50% of the revenue (N$300) is shared directly with conservancy members, (all community adults above the age of 18). This system is appropriate as there are relatively few beneficiaries.
- Social funds have been set up in some CCs to assist needy members when help is needed.
- Benefits are shared amongst the different geographic areas or on a village to village basis.
- Community schools, water points and clinics are financed in some CCs.
- Soup kitchens for the elderly and for orphans are supported in some CCs.
- Several conservancies are already supporting "insurance schemes" which compensate farmers for people and livestock killed by wildlife.
- Residents in conservancies with trophy and premium hunting benefit from meat distribution.
- A small minority of the households in CCs benefit from employment opportunities. Income from joint venture tourism usually takes the form of salaries to staff employed at these facilities. Much of a conservancy's budget is used to employ game guards and other personnel such as managers and secretaries.

Figure 5.9: Population and size of conservancies



In 2005, conservancies earned more than N$13.7 million, which represents approximately 69% of the total CBNRM income of N$19 943 7674.

This represents an increase of 61% from 2003 and demonstrates the prominent role that conservancies now play in generating benefits through CBNRM activities.

Conservancy size

Figure 5.9 shows the imbalance between the sizes of conservancies in km^2 and the resident populations. Whilst there are some small CCs generating high revenues, these are the exception to the rule. Densely populated conservancies face the challenge of low income per capita and individual households benefit very little.

5.3.3 Economic viability

The results of the conservancy valuation are summarised in Table 5.1. These values give comparisons of the project investment, project income, community income and economic value of the conservancy investment. The economic values tell us whether the initiative contributes positively to national development or not.

Table 5.1: Base case financial and economic values for the five Namibian conservancies in 2005 (N$)

Conservancy:	Torra	=/Khoadi //Hôas	Nyae Nyae	Mayuni	Salambala
Project financial values					
Initial capital investment	2,377,955	1,066,943	3,882,102	955,746	1,733,637

[4] This figure differs from the Total Financial Benefits from CBNRM for 2005 as reflected in the LIFE Plus semi-annual report for the period: October 1 through March 31, 2006. WWF LIFE Plus Programme, Windhoek. The figure above excludes the value of game donated to conservancies in 2005 which amounted to N$318 000 and includes an additional amount of N$162 594 from trophy hunting not captured in the LIFE report.

Annual Gross Income [a]	1,657,045	525,257	742,702	784,240	589,771
Variable Financial Costs [a]	412,231	151,691	335,813	27,796	135,387
Fixed Financial Costs [a]	993,055	471,874	1,031,653	653,967	539,292
Annual Net Income [a]	251,758	-98,308	-624,765	102,477	-84,908
Project Financial rate of return [b]	11.10%	15.59%	11.29%	2.59%	2.93%
Project Financial net present value [b]	576,862	1,005,616	1,190,788	-643,848	-793,640
Community financial values					
Financial rate of return [b]	54.92%	126.24%	-0.62%	106.63%	12.78%
Financial net present value [b]	3,632,381	2,440,354	-982,717	2,673,568	279,179
Economic values					
Annual net value added [c]	1,146,490	171,048	-305326	442,994	229,683
Net value added per ha.	10.56	0.96	-0.34	140.07	20.88
Economic rate of return [b]	71.80%	33.28%	11.29%	45.34%	19.61%
Economic net present value [b]	638,2958	2,501,592	1,119,412	2,115,078	1,429,864

[a] Based on year 10
[b] Measured over 10 years (8% discount).
[c] Gross value added minus asset depreciation

The results show that all projects in three of the five conservancies (Torra, =/Khoadi //Hoas and Nyae Nyae) are financially viable as the financial internal rate of return is above the hurdle rate of 8%. The economic IRR for all conservancies also exceeds the hurdle rate of 8%. All community rates of returns are significant, except for Nyae Nyae conservancies.

There are various reasons for weak financial returns with regard to the annual net income. Firstly, conservancies appear to be under-reporting their actual income. Based on data from WWF Namibia, actual income for all five conservancies should, on average, be 30% higher than that obtained from the fieldwork. The weak internal controls and financial record keeping in conservancies contribute to the under-reporting. Secondly, fluctuations in income from trophy hunting due to annual changes in quota allocations lead to low financial returns. Thirdly, another source of a conservancy's income, lodges, is only partially captured in the models: only the royalty accruing to conservancies (on average 8% of gross turnover from lodges) is captured, as the rest accrues to the private sector owners and/or operators. If we include this income, the financial viability of these entities is greatly enhanced. Finally, as the natural resource base continues to grow in the conservancies, as it has over the past ten years, continuing investment, for example in a second lodge, would enhance the CC's economic and financial viability.

Overall, conservancies are economically efficient and should be regarded as a valuable addition to existing livestock and crop production systems in communal areas. They are valuable income diversification strategies for their communities.

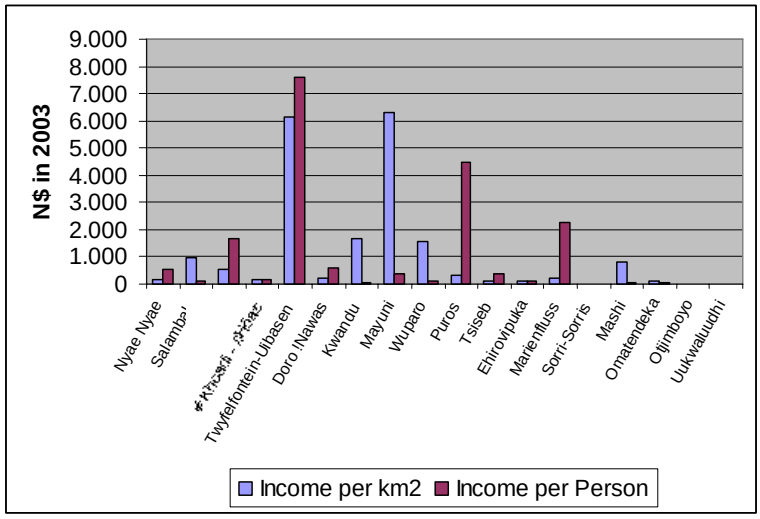
Sensitivity analysis

A simple sensitivity analysis was carried out on two important financial parameters with which conservancies are grappling: annual gross income and annual variable costs. This was apparent from our fieldwork. The aim was to ascertain whether these affect the internal rates of return from a financial viability

point of view. The base case parameters were decreased and then increased by 50%. The full results of the sensitivity analysis are presented in Annexure 5. The results show that as expected, increasing annual gross income increases financial viability, whilst a decrease in annual income further reduces financial viability. As expected, increases in variable costs further decrease the prospect of financial viability, whilst a reduction increases financial viability for the conservancies.

5.3.4 Socio-economic impact and external effects

Figure 5.10: Income analysis of 18 conservancies in 2003



Communal conservancies are not designed to be the main livelihood strategy for the population in the respective regions, but rather designed to complement the income generated by the current activities.

Figure 5.10Fig 5.10 converts the income streams of selected conservancies depicted in Figure 5.6 into incomes per square kilometre (100 ha) and income per capita for the respective CCs. The analysis reveals that incomes from conservancies are, with a few exceptions, comparatively low. Only one third of the18 conservancies generates more than N$400 per km² (N$4 per ha). In per capita terms, the income of 12 of the CCs is below N$500 (N$2 000 to N$2 500/HH).

As long as the conservancies manage to adjust their expenditure according to the income generated by their various enterprises they can continue to operate viably. The crucial factor will be whether in the perceptions of the farmers in a CC, the benefits exceed the disadvantages that go hand-in-hand with farming in a conservancy.

The WILD report and other research has investigated the human-wildlife-conflict (HWC) impact of conservancies on household level and concluded that there are a number of benefits to households. With regional differences, some or all of the following activities were attributed to conservancies: reed and thatch harvesting, extraction of building poles, fishing and craft making. There is, however, a sound argument that general activities have no direct connection with the conservancy mandate (which focuses explicitly on wildlife), and should therefore not be attributed to the existence of a CC. Twenty-four percent of the households in the Caprivi and 29% in the Kunene benefited directly from wildlife utilisation.

Available literature also established that living within conservancies and close to wildlife comes at a price. Over 50% of the households surveyed in Torra reported that they suffered crop or livestock damage from wildlife – wildlife conservation can also result in significant “costs” to households.

The increase in game populations in conservancies, which are often predominantly farming areas, has also considerable negative impacts as Table 5.2 reveals HWC incidences on a national level:

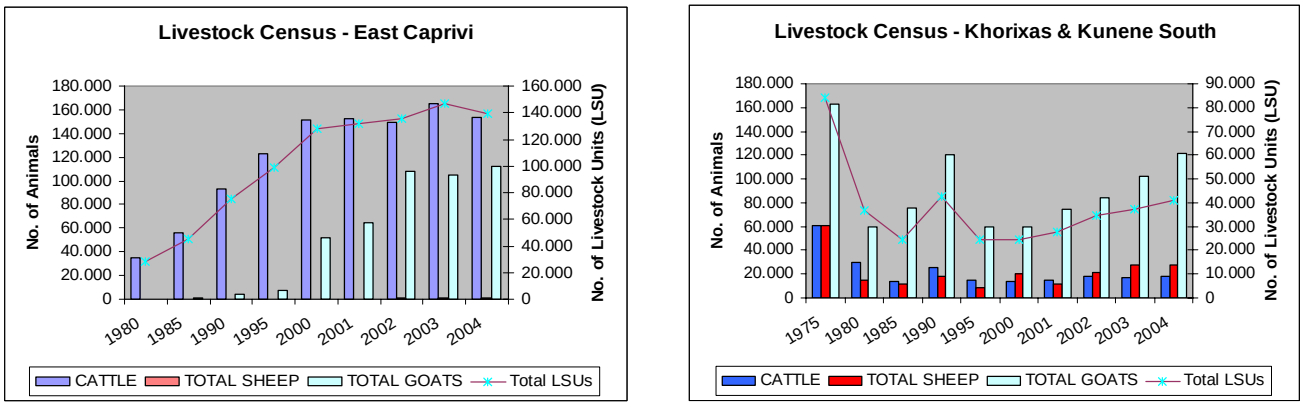
Table 5.2: Wildlife damage in Namibia's conservancies

	2003	2004	2005
Human Attacks	17	14	15
Livestock Attacks	1733	1684	2658
Crop Damage	1098	1084	1470
Other Damage	171	154	139

The statistics in the table above show an alarming increase in the number of incidents[5] of damage caused by wildlife. With nearly all the benefits shared by the wider community, the cost of living with an increased game population is largely borne by people. Increased presence of game aggravates the demands on existing resources. As

Figure 5.11indicates, there has been a dramatic increase in livestock numbers over the last 15 to 20 years, especially in the eastern Caprivi.

Figure 5.11: Development of livestock numbers and herd composition in different regions



Such trends lead to an increased competition for grazing areas between livestock and game, thus increasing the likelihood of HWC. As Table 5.2 indicates,

An internal working document of the MET[6] has attempted to assess the impact of wildlife damage in Caprivi in monetary terms:

[5] Table 5.2 details incidents reported in conservancies' "events books". This represents only a fraction of the conservancies and the actual extent of wildlife damage is believed to be substantially higher.

[6] Jonathan Barnes & Olimpio Nhuleipo, Economics Unit, MET : Economic impact analysis of human wildlife conflicts in Caprivi. Unpublished internal working document.

- Crop damage and predation on stock by wildlife in Caprivi costs households some N$540 per annum.
- Aggregate loss of GDP per annum from wildlife damage is some N$5.6 million.
- Households lose some 5% of their net livestock income and some 29% of their net crop income to wildlife damage.
- In the Caprivi, benefits from CBNRM compensate communities for the costs of wildlife damage.

The magnitude of the financial losses of individual households is very significant. In most cases, it far exceeds benefits distributed to individual households. This has been realized by planners supporting conservancy development, and so a number of approaches are being used to manage conflict between people and wildlife. Nine conservancies in the Caprivi and the Kunene are testing phase two of the pilot scheme – the Human-Animal Conflict Conservancy Compensation Scheme (HACCCS). This project aims to insure individual conservancy members against stock losses. In this second phase, most conservancies now pay 50% of their claims from their own income and are taking the lead in running this process. A Problem Animal Strategy (PAM) worked out for each conservancy forms a key component of the scheme. The strategies attempt to link rights and responsibilities. For example, Caprivian stock that has not been kraaled at night, or that is killed inside a national park, may not be claimed. A review panel, consisting of representatives of MET, conservancy committees, traditional authorities and the facilitating NGO (IRDNC), monitors the process. Phase three will test a crop damage scheme in one Caprivi conservancy.

As

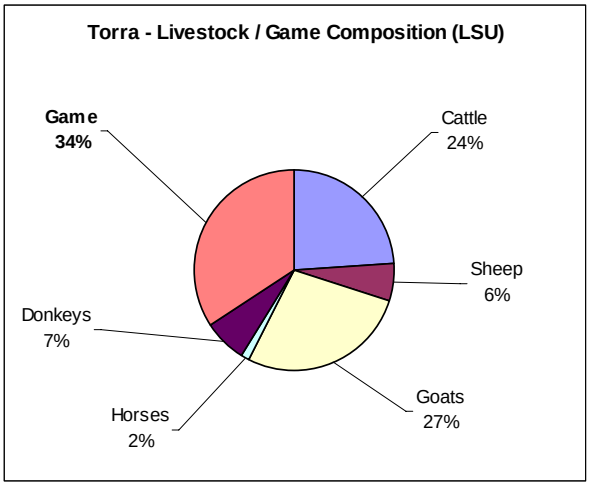
Figure 5.12 (next page) indicates, wildlife impacts to varying degrees on the local land use system. The figures for wildlife are based on actual game counts by WWF and communities,[7] and represent their joint estimates.

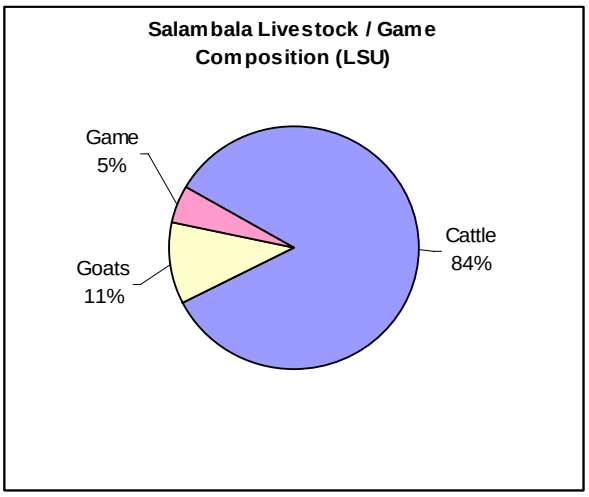
The different percentages of wildlife are also an indication of the competition for grazing. In Torra, wildlife accounts for more than one third of all LSUs, this impacts significantly on local grazing and land use in general with regard to the feed consumed as well as the actual land occupied. The higher the wildlife presence in an area the more important it is that households receive material benefits from such enterprises. In the Kunene, the high presence of plains game, such as springboks, and their respective growth rates call for high off-take rates which then reach households in the form of distributed meat.

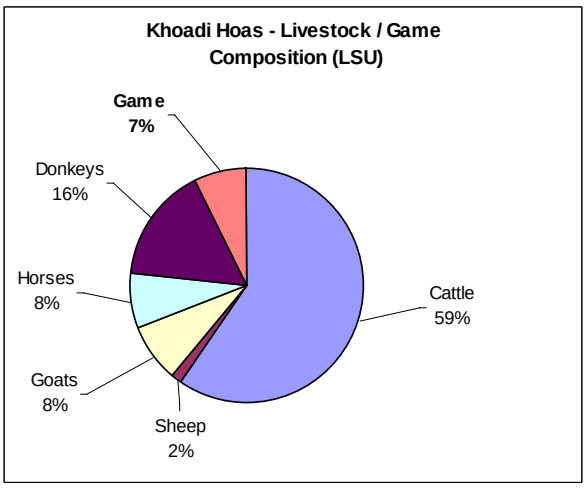
On a national level, the value of meat distributed to the communities amounted to some N$774 567 in 2005.

[7] The figures for wildlife in the Kunene are based on joint game counts by WWF and communities in 2004; the data for Salambala are estimates based on personal communication by WWF/IRDNC officials in the area. Livestock data are based on the livestock census of 2004. For Torra and Salambala, the livestock composition was estimated on the basis of regional statistics (Khorixas/Kunene South and East Caprivi respectively). ≠Khoadi //Hôas supplied actual livestock data from an internal census.

Figure 5.12: LSU composition (livestock/wildlife) for selected conservancies







5.4 Constraints and recommendations

Constraints:

Major development constraints presently faced by communal conservancies are:

(a) a lack of technical capacity in the conservancy committees and management

(b) issues of conservancy membership and representation

(c) benefits and cost sharing

(d) land use planning

(e) regional cooperation

(f) marketing.

Recommendations:

Develop the technical capacity of the CC officials and members

In order to utilise the full resource potential in the different communal conservancies, committees and management as well as members require technical training and extension support. Conservancies need to be understood as business entities and the different activities as separate, although related, enterprises. Business training for the management structures is still an important requirement to effectively manage and market the different products.

Previously, most technical support to conservancies focused mainly on the management of wildlife and tourism. Conservancies should be seen as a strategy for the diversification of the rural economy which provides a variety of income streams for the local communities. This in itself presents new challenges and requires outside technical support to optimise the respective enterprises.

Membership and representation

The sustained success of these communal approaches to resource use (conservancies and forests) will depend on the benefits that individuals and communities as a whole derive from this land use system. Important in that context will also be the aspect of representation of the conservancy population on the committee.

The law gives rights to conservancy committees but not to the community and this blurs the aspect of accountability and issues of membership. Committees have upward accountability, but not outward towards the community. In a number of conservancies this has already led to a reorganisation of the structures and the election of committee members.

In order for the committees to work easily with the broader community, the ToR for the representatives need to be clear and approved by the broader conservancy population.

It does not seem necessary to have formal membership of a CC, since all households in the area are affected by the increased presence of wildlife and all are supposed to adhere to the management plan in any case. In addition, benefits distributed usually come in the form of contributions to communal facilities or projects, from which all members of the community profit.

Benefits and cost sharing

At the moment, a number of conservancies receive tangible benefits, but in many cases these do not trickle down to individual households, whose support and adherence to land use practises which are often restricting, directly uphold the success of a conservancy. As the analysis has shown, in most CCs it is not feasible to distribute “dividends” to the members because the benefits per capita are too small. It makes more sense to support measures that address communal needs. Nevertheless, it is important for the broader public to have a say in which communal projects are supported.

Also, even if the distribution of direct financial benefits to individual households is not feasible, it is important for the sustained commitment of the members to conservation that CCs allocate resources to compensate household for wildlife damage.

It is important to remember that most communities have no alternative to a conservancy, because the game is resident in the area in any case. The conservancy concept at least allows a community to utilise this resource base and to derive some income from it.

Land use planning

It is the primary objective of conservancies to plan for the management and utilisation of wildlife in the area. Since the state bestows custodianship for this important resource on conservancies, it does not make sense to withhold other resources from communal governance. For instance, CC residents have no jurisdiction over the plant life in their area such as forests or devil's claw. The FIRM approach (Forum for Integrated Resource Management) is being piloted in a few conservancies and should become standard. In terms of this approach, communities are empowered to plan for the sustainable use of all the potential resources within their respective areas.

Since most conservancies have fluctuating game populations due to seasonal migration patterns, it is important that CCs who share these moving assets also cooperate in their land use planning and the zoning of their land.

Quotas for conservancies appear to be subject to annual fluctuations. The authorities responsible for quota setting should aim at more conservative estimates that can be maintained over a number of years. This would give CCs clear perspectives and allow them to draw up reliable business plans.

It is important to remember that conservancies are made up of farm- and woodland that provides for the livelihood of the population living in that area. A conservancy represents a communal enterprise to use the wildlife or other natural assets that are already present in the area. Such an enterprise should provide additional income, create jobs and at least compensate the population for losses and damage caused by wildlife.

Regional cooperation

Most conservancies are affected by wildlife migration. Since quotas are often issued as a percentage of the herd sizes of the different species, agreements must be reached between the different communities on how proceeds from trophy and own-use hunting are to be shared.

The initial site selection and dimensioning (size determination) of conservancies has not always followed economic or ecological criteria, both important parameters for the sustained success of a conservancy. Dimensioning and spatial design of conservancies is often based on considerations such as traditional authority boundaries, ethnicity, etc. Whilst such considerations may have merit, regional collaboration agreements are necessary to balance the income streams and ensure the fair sharing of benefits between all communities in such areas.

Marketing

The conservation perspective has, for the main part, driven and support the conservancy concept, however the conservancy concept has not been widely marketed, despite tourism being the largest income generator for conservancies. The official Namibia Tourism Board website does not deviate from conventional tourism products and no reference is made to conservancies. Other internet searches link CCs to hunting and conservation. There is a need to market conservancies in their own right. In this respect, conservancies could learn a lot about product design and marketing from the private game farms.

Premium hunting has not been widely marketed either.. With growing game populations, premium hunting could provide a substantial income and compensate for the reduction in trophy quotas. According to WWF[8] there is considerable potential for such an enterprise, such as hunting elephants in the Caprivi and plain game in the Kunene.

6 ANALYSIS OF COMMUNITY FORESTS

By
Joseph Grimm
Michael Humavindu

6.1 Background

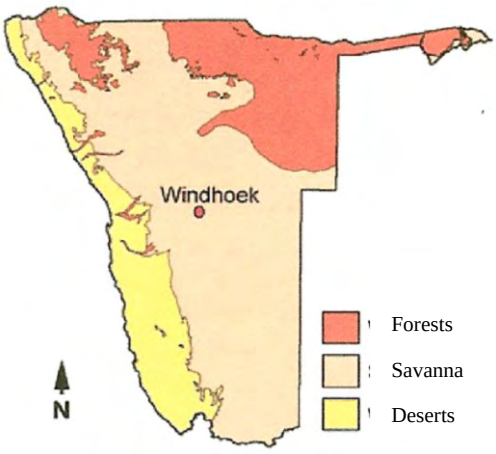
6.1.1 Objectives of the programme

. Over 260 000 km² of Namibia's land mass is communal land and this area is home to approximately 68% of the country's population. About 28% of this area is forested and large sections are community forests and communal conservancies. Many households living on communal lands in the north and north-east of the country depend on communal land and for the upkeep of their livelihoods as well as the utilisation of forest products.

The natural forests provide grazing for livestock grazing, and wood which is used for building, fuel, furniture and other household items. A broad variety of forest plants supply food and the ingredients for a range of traditional and commercial medicines and products.

Forests prevent land degradation, act as corridors for wildlife migration and act as carbon dioxide "sinks", playing an important role in the protection of water sources in the context of integrated water basin management.

Fig. 6.1: Major Agro-Ecological Zones



Data Source: Mendelsohn et. al

[8] Personal communication.

Prior to independence in 1990, communal areas in general but particularly in the north and north-east for decades lacked basic agricultural and land management support. The fact that forest areas were "policed" rather than managed sustainably by the South Afrucab authorities did little to create a sense of ownership of the environment amongst the local population.

Overgrazing and uncontrolled fires have led to bush encroachment and the degradation of the forest areas. Handing the responsibility for the environment back to the people on the ground is a logical step. The successful introduction and implementation of the community forests (CF) concept depends on the awareness of the communities of their rights to manage such areas, but also on their willingness and their technical know-how to do so.

The community forestry approach has now become an integral part of the Ministry of Agriculture, Water and Forestry's CBNRM programme. Based on the experience gained from various pilot projects over the last 15 years, the Department of Forestry (DoF) now pursues the implementation according to the Community Forestry Guidelines, which are derived from best practises and lessons learnt in the past.

Since ecological and natural conditions vary considerably throughout the country, this has given rise to different land use practises. DoF has therefore formulated the objectives for community forestry in broad terms:

- Contributing to poverty reduction and rural livelihood improvement through:
  - Controlled harvesting and management of forest products for subsistence and/or commercial use.
  - Creation of employment opportunities.
  - Promotion of technical, organisational and marketing skills.
  - Sustainable land use planning that besides forestry also benefits agriculture and livestock enterprises.
- Over and above these technical objectives, it reinforces communities' rights to communal land.
- The concept provides for decision-making and conflict resolution directly on community level.

There is no blueprint for the establishent of CFs. The implementation of the programme takes cognisance of the respective land-use history, the current prevailing traditional land use practises, ethnicity and the existing socio-economic conditions.

6.1.2 Guiding policies and strategies

The Constitution of Namibia states in Article 95(1) that Namibia shall actively promote and maintain the welfare of the people by adopting policies aiming at " … the maintenance of ecosystems … and the utilisation of living natural resources on a sustainable basis for the benefit of all Namibians". The country's Vision 2030 also emphasises the need for sustainable development by stating that the country's "diverse woodlands, savannas and the many resources they provide must be managed in a participatory and sustainable manner to help support rural livelihoods, enhance socio-economic development and ensure environmental stability".

In 2001, Parliament passed the Forestry Act providing for community forests. The objective was to build adequate community institutions focusing on:[9]

- Capacity building;
- Compiling forestry inventories;
- Dealing with controlled extraction; and
- Developing management plans for the respective areas.

Communal forests can be established by communities with the consent of the respective traditional authority, but they require the endorsement by the land board and the final approval of the responsible minister. DoF will enter into a written agreement with the respective community on the basis that:

- The geographical boundaries have been identified;
- A management body (FMC – forest management committee) has been established to manage the use of the forest, to ensure equal access to the CF by the members of the respective communal land and to provide for the equitable use of or distribution of the surplus.
- A management plan for the CF has been compiled by the FMC outlining how the forest produce and other natural resources of the forest are to be managed and used. Furthermore, the conditions under which certain products can be used must be stipulated and the FMC must be authorised to collect and retain fees.

6.1.3 Implementing agencies

6.1.3.1 Provision of financial support

Communal forests have received very little so far in direct financial support. The concept of community forestry is still comparatively new in Namibia. At present, many of the CFs are busy with the detailed compilation of their management plans. Once all the resources within a given area have been listed and their full potentials identified, a more comprehensive business plan (management plan) can be drawn up. There is a range of forestry products and non-timber-forestry-products (NTFP) that have potential for commercialisation, some of which also have potential "value chain development". Once such concepts are reflected in business plans, the need for financial support will arise. Some financial support will be provided under the German Development Cooperation support through CFNEN (Community Forests North-Eastern Namibia).

6.1.3.2 Provision of technical support

The communal forests concept places the stewardship for this important national resource in the hands of the respective communities. The role of the DoF is reduced to providing technical support, which focuses with different training steps on the different implementation stages of the community forests.

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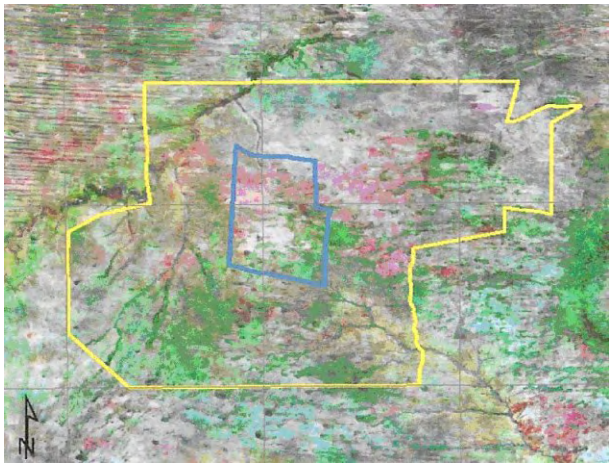
[9] Objectives of community forests: **"…to manage and use forest produce and other natural resources of the forest…"** Forest Act (2001) Section 15, 2d.

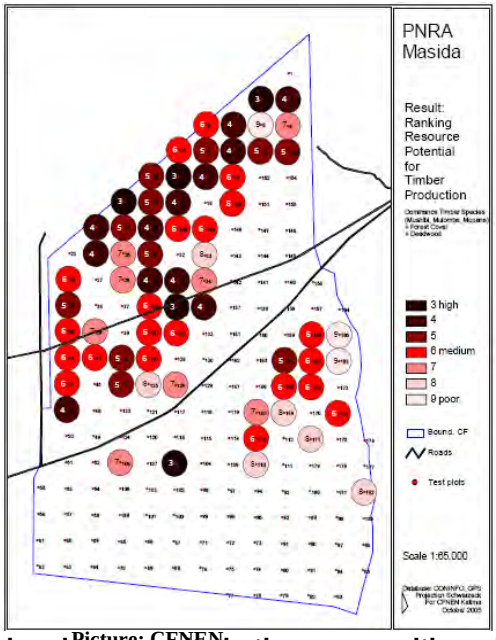
During the ***Initiation Phase*** the focus is on awareness creation and organisational support for the establishment of the respective structure (FMC). During the ***Application and Declaration Phase***, indicative mapping of the resource base and the demarcation of the proposed boundaries takes place. Furthermore, the by-laws which prescribe how costs and benefits are to be shared must be worked out. The third phase deals with all aspects of ***Implementation and Monitoring***. It is during this phase that the forest is inventoried in detail, a management plan compiled and the FMC strengthened.

Figure 6.2: Satellite image of CF area



A number of the community forests are already in Phase 3 and the DoF is providing direct advisory and management support to these FMCs. DoF staff, in close cooperation with technical advisers from the German Development Service, are supporting FMCs in different regions within the CFNEN programme as they assess their forest potential, compile their management plans and assist in product development and the formulation of marketing strategies.

Figure 6.3: Resource map of CF Masida



Picture: CFNEN

Figure 6.2 depicts the use of satellite images in mapping boundaries (yellow line outlines the extent of N‡a-Jaqna conservancy and the blue line marks the 8 675 ha gazetted as M'Kata Communal Forest). More importantly, such images help to assess the forestry resources (for example, red indicates a high concentration of trees), assist with the monitoring of the environment and help to determine extent and impact of forest fires.

CFNEN has found a good balance in supporting the planning capacity in the communities with high-tech-generated technical information.

Figure 6.3 reflects the detailed results of a participatory natural resource assessment (PNRA) indicating areas with potential for timber extraction.

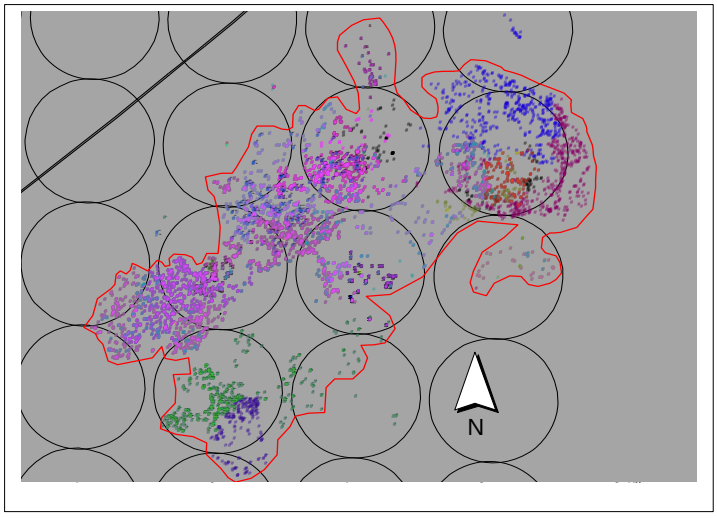
The next step is for the prevalence of different species (size and number of trees) to be determined, giving an indication of the area's economic potential. The use of GPSs allows the establishment of a geo-referenced inventory system, indicating the spatial distribution of the different tree species in a given area (see

Figure 6.4). Such information assists an FMC to compile realistic and sustainable business plans based on actual potential of an area.

This highly commendable detailed high-tech approach is being used in some pilot areas only, but the ex

perience gained in its application assists the CFNEN team to analyse large sections of the different regions and to establish forestry potential based on satellite images and aerial photo interpretation.

Figure 6.4: Detailed survey of important tree species



Currently, most CFs are still busy with the detailed analysis of their respective forest's potential. The full commercial utilisation of the various forest products is presently tested on the basis of a few pilot products. However, wide-scale utilisation will still require continued close technical support from the DoF and its respective partner institutions.

The DoF is conducting a variety of trials on methods of upgrading existing forests. Coppicing trials with mopane (colophosphermum mopane) and terminalia (terminalia sericea) species have so far yielded impressive results. Within three to four years, coppiced trees develop straight poles of two to three metres in length; these are sought after in certain areas (building construction; droppers for fencing). These techniques could even lead to enterprises specialising in such products, however an analysis of their commercial potential has not been carried out.

Given the potential for commercial activities, communities need to boost managerial and entrepreneurial capacity. This should become an priority for technical support intervention.

6.1.4 Institutional environment

Traditional authorities are key to the establishment and the success of community forests. Chiefs are either members of FMCs or maintain close links with them.

Technically, the DoF is the most important partner institution for the CFs. The DoF has also a legal function to undertake: approving management plans and monitoring their implementation. Besides these supervisory functions, the DoF is also the main source of technical support.

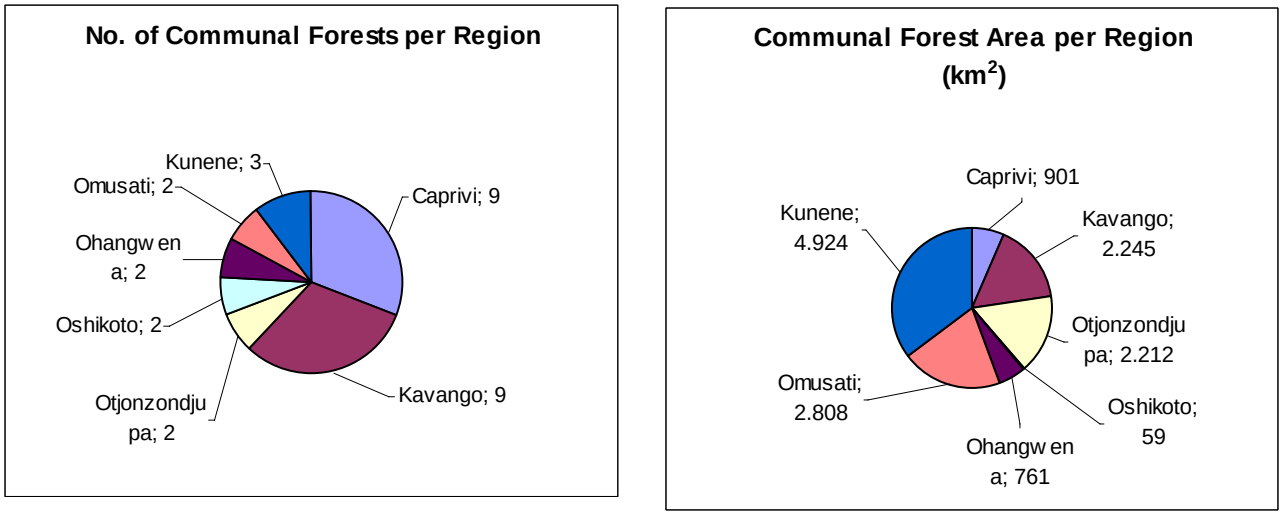
Land boards play an important role during the establishment of community forests as their approval is required before the minister can officially gazette a CF area. Afterwards, land boards are required to monitor whether the designated land use system is being implemented. In the Caprivi, first steps have been undertaken to integrate CF closely into the local and regional governmental structures such as village development committees and constitutional development committees.

6.1.5 Selection and characteristics of sites

General

The Department of Forestry has adopted a dual strategy distinguishing between "forest poor" areas (Type 1) and "forest rich" areas (Type 2). The latter are found mainly in the Caprivi and Kavango Regions and correspond with the FAO classification of forests, warranting more stringent management aiming at a higher output from the area. Currently, the DoF recommends the more low-key Type 1 as the dominant approach to community forestry.

Figure 6.5: Development status of communal forests



By 2005, a total of 29 communal forests had been identified and 13 were already gazetted. The 29 CFs cover an area of 1 390 959 ha and are home to some 240 000 people. Especially in the Caprivi and Otjozondjupa Regions, CFs are often found within areas that have also been declared a communal conservancy.

During this investigation the following sites were visited:

M'Kata Communal Forest

The gazetted forest area is 86 750 ha of semi-arid woodland in extent. The San communities who inhabit the area grow some millet and keep some livestock. There is, however, a strong attachment to the traditional way of life as people collect nuts, tubers, leaves and edible fruits. Game has largely disappeared from the area. The area in which the M'Kata forest is situated was recently gazetted as a conservancy (see Figure 6.5 above).

Major challenges are (i) uncontrolled bush fires, (ii) deforestation around settlements, (iii) depletion of grazing resources around water points, (iv) unsustainable use of groundwater, and (v) disappearance of wildlife from the area.

There is increasing pressure on the forest for grazing from communities living adjacent to the community forest.

Masida Communal Forest

The 1 200 inhabitants (220 households) live in 21 villages which are situated within the 19 000 ha community forest. The forest is managed by a committee comprised of representatives from the different villages (area representation) and the local chiefs. Masida borders on the Lubuta CF in the west, a state forest in the north and Mudumu National Park in the south. There are two different committees responsible for the two communal entities in the eastern Caprivi.

Fig. 6.6: Site map communal land use in Caprivi

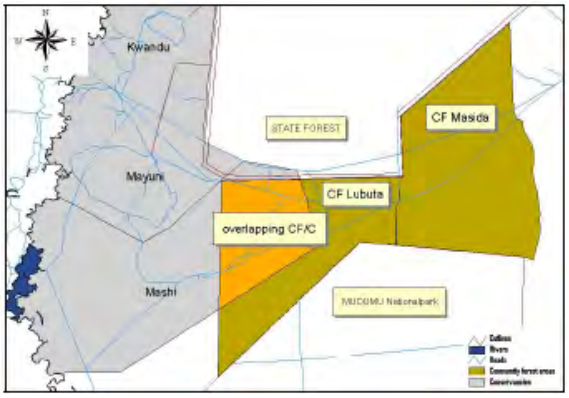
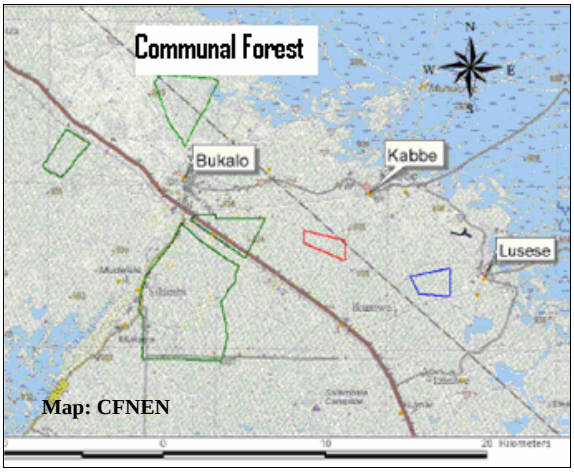


Fig. 6.7: Bukalo communal forest area



Bukalo Communal Forest

There are over 1 100 households (6 300 people) involved in the CF programme and the community forest area covers 5 500 ha of woodland. Most of this area is part of the communal conservancy area of Salambala There are also substantial forestry resources within the communal conservancy and the alignment of CC and CF operation in the area is under consideration. The existing forest area is used by migratory game (elephants) which at times causes considerable damage – especially to young trees.

Due to comparatively high rainfalls (from 5 to 700 mm/yr) there is good grazing in the area and farmers keep herds averaging 30 head of cattle.

In general, forest areas in the north-east of the country have higher growth rates and higher extraction rates for timber and non-timber forestry products. Communal forests in this area thus yield higher returns per unit area than forests in other regions.

6.1.6 Existing financial and economic data and publications

The CF programme was officially launched in 2004 and the first 13 CF were established. A lot of work had to be done and much is on-going, such as developing the managerial capacity of the forestry committees. Comparing the community forestry programme with the communal conservancy programme, as far as conservancy establishment is concerned, the DoF appears to receive far less external support than the MET.

For the purpose of this study, three CFs in the operational area of "Community Forests North-Eastern Namibia – CFNEN" were visited. As the respective communities currently have little experience on the commercial utilisation of the forests, there is no financial or economic information available yet.

CFNEN has embarked on a thorough analysis of the existing potential and is currently supporting the various committees as they determine their respective strategies and development plans. There are a number of brief sectoral working papers available that outline the potential for different products.

6.2 Financial analysis

6.2.1 Investment costs

There is currently negligible external formal investment into the productive potential of communal forests. Communities themselves have purchased tools such as saws and axes. The DoF/CFNEN assists with finance for cutlines and bush roads, and in some cases with the establishment of forestry offices.

Development plans for the Caprivi envisage the establishment of a commercial forestry unit that should allow local value addition and resulting higher value products leaving the region. The establishment of such a unit would require an initial investment of less than N$500 000. A detailed projection of the business development is given in Annexure 6.

Some community forests (such as M'Kata) use most of their income from permits to cut and clear fire lines. This should not only prevent large-scale fires, but should also allow for better management and utilisation of the existing resources. Currently, 200 tons of firewood are lost to uncontrolled fires every year. The amount of commercial hardwood lost has not been assessed.

6.2.2 Financial viability

Community forests finance themselves through fees for permits, and from charging "royalties" for specific products for the harvesting of certain categories of forest products.

Table 6.1: Gross margins for selected timber products at M'Kata CF

Firewood Production per Year	No. HH		**Present N $**	**Future N $**
No. Of Tons			325	525
N $ / ton			300	300
Gross Output			**97,500**	**157,500**
Variable Costs:				
FMC - Fees		50%	48,750	78,750

Saw Timber (plank) Production per Year		**Future N $**
No, of Logs		200
N $ / m^3		2,500
Gross Output		**500,000**
Variable Costs:		
FMC - Fees (m^3)	1,200	240,000

Tools/HH	80	100	8,000	8,000
Total VCs			56,750	86,750
Gross Margin(GM)			**40,750**	**70,750**
No. Of HH	80			
Income per HH GM)			**509**	**884**
GM per ha			**0.47**	**0.82**

Tools/HH	10	1,000	10,000
Total VCs			250,000
Gross Margin (GM)			**250,000**
No. Of HH	80		
Income per HH (GM)			**3,125**
GM per ha			**2.88**

Interpreting the information in the table above shows that the M'Kata Communal Forest has the potential to generate a **gross output of at least N$657 500 which corresponds with N$7 58 per ha** from timber alone. The potential of income from NTFPs have not yet been estimated for the CF area.

6.2.3 Financing

The modalities for financing the commercial forestry unit have not been worked out in detail. It is envisaged that the community share in the capital costs f

or the establishment of the business at least should be financed by government or donor grants.

6.2.4 Marketing

The forests offer communities a variety of products, both timber and non-timber, for private use and commercial exploitation, however the concept of community forests is still very new and most of the sites have only been gazetted recently.

The current strategy[10] foresees using only deadwood. The following species are available in north-eastern Namibia and will be utilised on sustainability principles:

Pterocarpus angolensis (kiaat), guibourtia colosperma (rosewood), baikiaea plurijuga (Zambezi teak), colophosperum mopane (mopane), acacia erioloba (camel thorn), B. africana (red suringa).

Regional forest inventories and detailed inventories in community forests in the Caprivi have shown that there is the potential for sustainable utilisation of valuable hardwood species (baikiaea plurijuga, guibourtiacoleosperma, pterocarpus angolensis), resources of deadwood and undesirable encroaching bush and tree species. Planned harvesting operations (firewood and/or charcoal production) will actively restore and improve wildlife habitats and pastures.

The proposal foresees the development of a forestry-based joint venture between communities as minor share holders (<50%) and a private sector (manager), responsible for:

- buying raw materials from community forests and selling forest products,
- employing two mobile teams, in charge of operating specialised machinery (chainsaw, circular saw, mobile band saws),
- acquiring sufficient work for the two teams both in- and outside regions,
- deploying mobile teams, and
- organising logistics and infrastructure.

A financial analysis of the proposed unit is contained in Annexure 6.

In the past, commercial loggers extracted timber cheaply from community land and all value addition took place outside the region. Local timber processing currently takes the form of “pitsawing”, which results in products which are only tradable in the local market. The establishment of a forestry unit with the proper equipment for processing export-quality timber would generate far more income for the region.

Firewood and charcoal production could fall back on the abundance of suitable raw material. However, as the local market is fully saturated, opportunities to export these products, and the relevant logistics, should be investigated further.

Non-timber products such as devil’s claw and marula also have the potential for incorporation in a wide range of products.

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[10] The projection details for this commercial development venture are taken from a CFNEN internal working document.

6.3 Economic analysis

6.3.1 Costs

Communal forests utilise only “dead” wood for the different enterprises. If not used, much of this timber is burned in forest fires and for this reason, little economic value is attached to the use of this resource.

6.3.2 Benefits

Community level

Though some NTFPs require licensing by the FMC, people could continue to collect these products in any case, as happened in the past. However, the existence of a communal entity instils a communal approach towards using some of the products that may not face a large demand on the local market, but are internationally sought after such as marula nut oil and ximenia seed oil, for example.

The DoF-approved management plan of the elected FMC specifies the quantity and quality of forest products to be used. On the basis of this plan, individuals can decide to undertake an economic activity and this generates income for the FMC. The committee decides how to utilise the communal income. So far, the money has usually been reinvested into the forest by employing the community to cut fire lines, carry out surveys and monitor resource use.

Community forests do not undertake enterprises as a single entity, but derive their income from licensing fees and royalties charged to members for their entrepreneurial activities. Other indirect benefits of the CFs are improved forest grazing, greater availability of timber for the different uses, reduction of the fire hazards through controlled burning and the establishment and maintenance of fire lines.

Household level

Community forests offer their members a variety of opportunities for income generation. So far the principle has been that individuals or groups undertake to utilise some of the products that are considered communal property. Depending on the product, the FMC issues permits for the type and quantity of product against payment of or claims to a certain percentage of the proceeds of a transaction – in some cases up to 50%, of the proceeds.

The fact that individuals can be proactive offers households an opportunity to earn some cash. In this context CFs activities are also suitable to female-headed households and households affected by HIV or AIDS.

6.3.3 Economic viability

The CF programme is expanding. Whilst there is insufficient data available to warrant an economic analysis, indications point towards a highly economical endeavour. Barnes et al (2005) anticipate the typical characteristics of a forest use enterprise as small-scale fuel, wood, pole and non-timber forest products (NTFP). One NTFP example is cut grass. The saw timber extraction model is of a large-scale commercial enterprise producing saw-milled baikiaea plurijuga and pterocarpus angolensis planks. All models are economically efficient and financially viable.

Table 6.2: Characteristics of typical forest use enterprises in Namibia

	Units	Small-scale Fuel wood	Small-scale Poles	Commercial Saw timber**	Small-scale NTFPs
Volume produced	m^3/annum	5.50	6.12	15,000	-
Financial (private) values					
Initial capital	NAD	900	900	6,059,900	1,100
Gross output	NAD/annum	4,300	2,100	23,003,300	3,400
Variable costs	NAD/annum	100	100	9,060,400	600
Fixed costs	NAD/annum	500	400	4,513,100	1,000
Net profit	NAD/annum	3,700	1,500	9,429,800	1,800
Internal rate of return	% 10 years	153%	84%	37%	79%
Net present value	NAD 10 years	19,300	7,700	35,650,800	7,800
Economic values					
Gross value added	NAD/annum	4,300	1,900	16,150,900	2,200
Value added/output	%	94%	89%	66%	67%

Source: Barnes et al 2005, extracted from empirically derived financial end economic models (NAD, 2004)

6.3.4 Socio-economic impact and external effects

General

Members of the different communities have started to benefit from the community forests. Forests in different agro-ecological zones (AEZ) offer a variety of different products for exploitation. Quantity and quality of specific product yields will depend on the impact of the prevailing agro-ecological conditions in an area. The following tables give a brief overview of current land use practices with regard to forestry products.

M'Kata Communal Forest

CFNEN has carried out a preliminary survey of the commercial potential of the area. This investigation concluded that the area has the potential to yield over 500 tonnes of firewood and about 200 dry hardwood logs annually. At this point, 325 tons of firewood are sold by about 80 households every year. Unit costs per ton are N$300. A household earns N$150 per ton sold (N$150 goes to the FMC), suggesting an average income of about N$600 per household participating in the scheme. The balance of the sales price goes to the FMC. In addition, planks are being sold with the licensed seller getting N$1 300 per m^3. The balance of about N$1 200 is retained by the FMC. The survey suggests that up to 200 dead hardwood trees could be extracted with a conservative estimate of 1 m^3 per tree.

Table 6.3: Current income opportunities at M'Kata CF

Products		Unit	No. of Units	N $ / Unit	Total Income	Income to FMC	Income to HHs	No. of HH
Firewood		tonne	325	300	97,500	48,750	48,750	100
Planks		m^3	200	2,500	500,000	240,000	240,000	80
Firewood *		tonne	200	300	60,000	30,000	30,000	n/a
Harphagophytum proc.	Devils claw	kg	2,090	11.00	23,000		23,000	100
				Totals	**680,500**	**318,750**	**341,750**	

* Presently about 200 tons of firewood are lost annually due to uncontrolled forest fires., but it is hoped that in years to come, with better fire management this amount will also be available for commercial use. (Note: Planks: N$20 000 was deducted from Total Income for FMC tools.)

The income opportunities from firewood and plank sales were illustrated in Table 6.1. In socio-economic terms, community forests offer the community several opportunities to earn an income. Harvesting devil's claw may generate an income of a few hundred dollars: during the last harvest, 100 households earned on average N$230 each (a GM of N$0.26 per ha). Taking all of these CF enterprises into consideration, they have the potential to generate a gross output of N$680 500 (N$7.87 per ha).

Bukalo Community Forest officially commenced its activities in 2005 and CF members have so far experimented with a few products (see table below). Most of the CF members are also members of the Salambala Communal Conservancy, and although the two structures operate side by side, efforts will be made to align these communal land use approaches and create greater synergies between them.

Table 6.4: Current income opportunities at Bukalo CF

Products		Unit	No. of Units	N $ / Unit	Total Income	Income to FMC	Income to HHs	No. of HH
Firewood		kg	9,012	0.50	4,286	n/a	4,286	n/a
Planks		Nos.	4	20	80	n/a	80	n/a
Poles		Nos.	217	5.50	1,194	n/a	1,194	n/a
Logs	Rosewood	m^3	7.7286		8,304	n/a	8,304	n/a
Other products:	Fruits	kg	224.5		1,122	n/a	1,122	n/a
	Grass	bundles			250	n/a	250	n/a
Fees			26		345	345	n/a	n/a
				Totals	**15,581**	**345**	**15,236**	

The activities undertaken since the Bukao CF started have already generated an income of N$2.77 per ha. It is uncertain how many of the 1 100 households participated in the activities.

Whilst Masida Communal Forestry has extracted little timber, its members have been active in the exploitation of NTFPs. At this stage the forest products are not fully exploited (especially marula) and CFNEN is working on strategies to add value locally to raise income margins on some of the products. The Masida

Forest generated N$3.07 per ha from NTFPs – household incomes varied between N$38.00 (sclerocarya b.) and N$157.55 (devil's claw).

Table 6.5: Current income opportunities at Masida CF

Products		Unit	No. of Units	N $ / Unit	Total Income	Income to FMC	Income to HHs	No. of HH
P angolensis	Kiat Planks				2,275	n/a	2,275	n/a
Permits		Nos.	26	15	405	405	n/a	n/a
Other products:								
Parinari curatellifoli	Mobola Plum	kg	45	1.00	45	n/a	45	n/a
Ximenia ssp.	Sour Plum	kg	160	5.00	800	n/a	800	n/a
Trichillea emetica	Natal Ma-hogany	kg	750.5	5.00	3,752	n/a	3,752	76
Sclerocarya birrea	Marula	kg	5,635	0.50	2,817	n/a	2,817	74
Harphagophyt. proc	Devils claw	kg	4,276.5	11.30	48,324	6,414	41,910	266
				Totals	**58,418**	**6,819**	**51,599**	

Communal forests offer their members a variety of opportunities to generate income for themselves. It appears that more than 50% of the income generated by the members directly benefits the individuals who undertook the activity. These opportunities offer many people, in particular women, an opportunity to earn a living.

6.4 Constraints and recommendations

Constraints:

Major development constraints include: (i) lack of technical capacity in the CFs, (ii) lack of access to finance, (iii) lack of access to markets, (iv) CF land in land use planning, (v) the legal status of communal forestry associations, and (vi) refinement of existing and development of new forestry products.

Recommendations:

Build technical capacity of the CF officials and members

In order to utilise the full resource potential in community forests, committees and CF members require technical training and extension support. The different raw materials available in the community forests require a local skill base capable of processing these products locally.

Facilitate access to finance

Local processing of raw products would encourage entrepreneurial activities in the villages and thus generate local income. In order to support such development, support agencies could assist local (potential) entrepreneurs to obtain micro-finance facilities.

Facilitate access to markets

The basis for broad-based utilisation of timber and non-timber products is a thorough analysis of the actual potential for the resources in the different community forest areas and to follow the analysis up with sustainable resource use projections for the medium-term. A professional forestry unit could then be estab-

lished in the region to increase value addition to local products. Finished goods produced should be of high quality so that they are marketable in other parts of Namibia and in neighbouring countries.

Potential distribution and retail chains should also be researched. These could offer employment opportunities.

CF land in land use planning

It is apparent that some individuals in positions of authority do not regard community forests as valid formal land use systems in their own right. During the field visits, consultants were confronted with two examples of land allocated by land boards to communities for community forestry being subsequently partially re-allocated for small scale commercial farming units without consulting the respective communities. This may have to do with the ambiguous legal status of the FMC and this problem needs to be addressed urgently.

Refinement of existing and development of new forestry products

Most forestry and non-forestry products are sold as raw products. There exists considerable potential to process such products further. It will require a detailed market analysis of where the various products can be marketed. At the same time the members in the different community forest will require technical and financial support to acquire the skills and the respective technical facilities to process and refine their produce.

7 ANALYSIS OF RESETTLEMENT SCHEMES

By
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7.1 Background

7.1.1 Objectives of the programme

The Government of the Republic of Namibia (GRN), through the Ministry of Lands and Resettlement (MLR), established the National Resettlement Policy in 2001. The primary aim of this policy is to make settlers self-reliant either in terms of food production, or self-employment and income-generating skills. This would encourage beneficiaries to improve their living standards, enhance regional development throughout the country and foster the wise use of natural and human resources. This policy is mainly aimed at the members of the San community, ex-soldiers, returnees, displaced persons, people with disabilities and people from overcrowded communal areas. There are three types of resettlement schemes:

1. Individual holdings, which are allocated to a family or to individuals;
2. Group holdings;
3. Cooperative holdings and other legal entities.

The GRN has classified categories of settlers as follows:

1. People who have no land, income or livestock.
2. People who have neither land nor income, but a few livestock.

3. People who have no land but have income or are livestock owners, and need land to be resettled on with their families and to graze their livestock.

People in the first two categories are generally assigned to group holdings, and normally only people from the third category are resettled under the individual holdings scheme.

The MLR was mandated to acquire farmland and make such land available to the landless Namibians. After independence, the Namibian government adopted the "willing seller – willing buyer" principle to purchase and transfer land from white commercial settlers to people from communal areas to make land distribution more equitable, alleviate human and livestock pressure in communal areas and improve the quality of life of people who were socially, economically or educationally disadvantaged by the colonial discriminatory laws or practices. Further objectives of the resettlement programme are to provide an opportunity for formerly disadvantaged people to produce their own food for subsistence purposes and/or to sell any surplus food products (thus contributing to the Namibian economy) and to create employment through farming and other income-generating activities.

7.1.2 Guiding policies and strategies

Realizing the importance and sensitivity of land acquisition and redistribution, the GRN promulgated the following legislations and policies:

The Agricultural (Commercial) Land Reform Act, Act 6 of 1995

The Agricultural (Commercial) Land Reform Amendment Acts

The Communal Land Reform Act, Act 2 of 2003

The National Land Policy

The National Resettlement Policy

The Land Use Planning Policy (draft).

These legal instruments were intended to assist and direct the government, particularly the Ministry of Lands and Resettlement, and to provide mechanisms for implementing land reform in Namibia. The Ministry of Lands and Resettlement developed strategies and targets to acquire land, through "willing seller and willing buyer" and expropriation approaches, In 2006 the GRN broadly accepted the recommendations contained in the major study by The Permanent Technical Team (PTT) on Land Reform, and the full operational implications of implementing these recommendations are currently being considered.

7.1.3 Implementing agencies

The MLR's mission is to eradicate inequitable access to land resources. It is thus responsible for establishing and protecting the access rights of needy citizens to land that they can settle on, develop and use and for facilitating the resettlement of displaced and landless citizens on the land. In addition, other line ministries and stakeholders are responsible for the coordination of supporting action plans in particular areas. These line ministries include the Ministry of Agriculture, Water and Forestry; the Ministry of Environment and Tourism; the Ministry of Works, Transport and Telecommunications; the Ministry of Regional, Local Government and Housing; the Ministry of Basic Education and Culture; the Ministry of Health and Social services and the National Planning Commission (NPC).

In terms of the National Resettlement Policy produced in 2001, the MLR invited the assistance of various stakeholders in redressing unfair land redistribution in Namibia. The MLR identified and prioritised areas to be addressed by line ministries and other stakeholders. These areas to be addressed by MAWF were:

- Provision of veterinary services;
- Assistance with farm valuations;
- Provision of agricultural extension services and training;
- Support to cooperative schemes;
- Market development;
- Provision of water; installation, maintenance and servicing of water points.

Each ministry needs to incorporate resettlement services into its policies. Financial constraints appear to pose the largest single obstacle to achieving equitable land distribution. For this reason, more funds need to be made available to the MLR so that work can be outsourced and services provided effectively and efficiently.

7.1.3.1 Provision of financial support

Parliament has approved the use of at least N$50 million each financial year to acquire and develop agricultural land and make such land available to Namibian citizens who do not own or otherwise have the use of adequate agricultural land, and primarily to those Namibian citizens who have been disadvantaged by the past discriminatory laws or practices.

At least 10% of the N$50 million has been earmarked for infrastructure development on all government-acquired farms to assist the resettled beneficiaries to commence farming.

In addition, the Government of Namibia, in collaboration with German Development Cooperation (GTZ), European Union (EU) and the Spanish Government, amongst other supportive institutions, is keen to assist resettled beneficiaries by providing necessary agricultural training and other related skills. The Namibia Nature Foundation (NNF) is also contributing to the resettlement training programme to equip beneficiaries with necessary skills and to ensure that the land allocated to them remains income-generating and productive.

People belonging to Category 1 (no land, income or livestock) are particularly in need of financial assistance, as was recognised by the PTT.

7.1.3.2 Provision of technical support

Although there are technical support programmes run by the MLR, resettled beneficiaries need on-going support if the land is to be productive. Training in agriculture-related activities is crucial.

The Ministry of Environment and Tourism's environmental education centres provide basic environmental training activities – the Ministry of Lands and Resettlement could capitalise on these educational centres and ensure that beneficiaries acquire farming skills before they are resettled.

7.1.4 Institutional environment

MLR is the lead agency in selecting resettlement beneficiaries and in providing them with technical and other support. There is considerable scope for improving coordination and cooperation between MLR and other key ministries, such as MAWF and MET, and the PTT made various recommendations that are intended to achieve this.

7.1.5 Selection and characteristics of sites

Livestock farming is the main farming activity of individual resettled farmers, and almost all beneficiaries own livestock (PTT, 2005b). Only about a quarter of resettled farmers produce crops, and these are only produced in small quantities, mainly for home consumption (ibid). The two main farming systems on Namibia's freehold farms are cattle ranching and small stock production, the former predominating in the north and central regions, and the latter in the southern regions of Hardap and Karas (Mendelsohn, 2006).

This information guided the selection of sites for the fieldwork. In order to obtain information about typical farmers, it was decided to interview two small stock farmers and two cattle (weaner) farmers. Hardap Region was chosen for small stock production, as it is reasonably accessible from Windhoek and a significant proportion of resettled farmers are located there. Within Hardap, it was decided to focus on Maltahöhe district, as it has low average rainfall and would thus increase the chances that the farmers selected would focus on small stock production. Hardap Region has been a focal region for resettlement for both the government and the AALS schemes (PTT, 2005b). Otjozondjupa Region was chosen for cattle farmers. It has also been a focal AALS resettlement

An additional stratification variable was the year in which the farmer was resettled. It was decided to include only farmers who had been resettled for at least five years, as this would mean that data covering several years could be collected and a general picture obtained of trends in livestock numbers and production. Farmers were randomly selected from those that remained, as this would increase the likelihood of choosing farmers who were reasonably typical – or at least avoid the potential bias of having government officials in the regions hand pick farmers who were doing exceptionally well.

There are almost two million sheep and more than 400 000 goats in the Hardap and Karas regions – half of Namibia's total small stock (goats and sheep) population. This is 67.5% of the national sheep population and 16% of the goats (Motinga et al., 2004). The majority (75%) of sheep in these regions are Dorpers, 10.5% are Karakul and 14.5% are other breeds (ibid). More than 95% of the goats are Boer goats. Goats are kept primarily for meat production, as are sheep; with the exception of the Karakul sheep which is farmed mainly for its pelt (see Chapter 8 for further details). Many freehold farmers in the south keep a combination of small stock – mainly Boer goats and Dorper sheep.

These regions of Namibia are among the driest in the country – the average annual rainfall in Keetmanshoop over the last 50 years has been 142 mm (ibid). Not only is rainfall low, but it is also very unpredictable and localised. In addition, average rainfall declined markedly over the period 1970-1994, apparently adversely affecting the carrying capacity of the land, particularly in the arid southern regions.

7.1.6 Existing financial and economic data and publications

A few previous publications and studies were found to contain relevant information, each of which will now be reviewed.

1. GFA terra systems (2002) *Infrastructure Support for Land Reform Programme in Namibia – Final Report*.

Financial analysis

This consultancy report makes a broad assessment of the "economic potentials and effects of different land reform models", distinguishing between:

- Cattle growing areas in the commercial sector;
- Small stock growing areas in the commercial sector;
- Small scale commercial faring units in the communal areas; and
- Small scale irrigation.

The report contains gross margins for the major farm enterprises associated with these land uses. It is positive about the cattle growing model, based on an assumed farm size of 1 000 ha and a cattle herd at full carrying capacity. It estimates an income potential of N$27 000 per year (excluding depreciation costs and the cost of purchasing the farm). However, the report notes that the success of the model depends on beneficiaries either (a) owning their own livestock beforehand or (b) having the financial means to acquire some as well as (c) having the experience or potential ability to manage medium-sized enterprises. The report notes that poorer households are less likely to satisfy these criteria.

The report's small stock growing model assumes a farm size of 3 000 ha and there are two variants: a sheep herd and a goat herd, both at full carrying capacity. The estimated income from the former is N$99 000 (N$33/ha) and from the latter N$11 000 (N$3.76/ha). It is noted that although the potential income from sheep is much higher than that estimated for cattle (and similar on a per hectare basis), small stock farming is more labour intensive and requires better (and hence more expensive) fencing. The study concludes that the estimated income from goat farming is too low to be viable. It assumes that the minimum income level is N$15,000, the minimum "required to provide a 'decent standard of living' for a household of 5-6 people as indicated by the Central Bureau of Statistics".

The report's Annexure 3 also estimated a gross margin for Karakul production of about N$70/ha, which could provide an annual household income of N$210 000. However, the report notes that these figures assume well-organised marketing of the Karakul pelts and specific know-how and infrastructure, and argues that "emerging" farmers would not be able to specialise in Karakul farming and obtain these gross margins in the short-term without external assistance.

The detailed gross margin calculations underlying the report's estimates of annual income from cattle and small stock can be found in Chapter 9 on commercial farming.

2. The Permanent Technical Team (PTT) on Land Reform, *Strategic Options and Action Plan for Land Reform in Namibia*, November 2005, Ministry of Lands and Resettlement.

This report, generally known as the PTT report, is a recent key reference on land reform in Namibia. However, it does not contain much financial or economic analysis. It notes that beneficiaries resettled on individual allotments have very low farm incomes on average, around N$7 000 p.a. (see next reference for details), and that (as the average area allocated per beneficiary is 1 500 ha) the income generated is no more than N$5.00/ha. The report does not contain any actual gross margins for agricultural enterprises of beneficiaries, but does cite some theoretical gross margins for irrigated crops from another study. It also briefly discusses some potential non-agricultural land uses for resettlement farms, such as wildlife, tourism and aquaculture.

3. The Permanent Technical Team (PTT) on Land Reform, *Background Research Work and Findings of the PTT Studies*, November 2005, Ministry of Lands and Resettlement.

Financial analysis

This report provides a considerable amount of additional information to that contained in the main PTT report. This information includes a table (reproduced below) giving an average livestock income per beneficiary household under the individual resettlement scheme. This is based on the average numbers of different types of livestock that were owned by households covered by the PTT's resettlement survey, namely 32 cattle, 28 sheep and 80 goats. These figures, and those in the table, seem to be an average for the whole of the commercial farming area, and hence conceal any regional differences that may exist. The other weakness of these figures is that they do not include gross margins for particular types of livestock, as all livestock expenses (presumably variable costs) are lumped together. Nevertheless, the figures make very interesting reading.

Table 7.1: Average livestock income per beneficiary household, 2003

	N$/year (all beneficiary households included)	N$/year (only those beneficiaries that marketed their livestock)
Gross income: cattle	4620	8882
Gross income: sheep	1219	2816
Gross income: goats	1987	2548
Total gross income	7826	14246
Less livestock expenses	(7447)	(7447)
Gross margin	379	6799

The report notes that beneficiaries who are not marketing or consuming are barely breaking even. Even those who are marketing receive an income (excluding fixed costs and depreciation costs) – N$6 799 – that is well below "the decent living income level proposed by the National Planning Commission (N$15 000 p.a. for a household of five people) and far lower than the income tax threshold of N$24 000 p.a." The report adds that this "confirms the importance of an off-farm income". It also notes that some resettlement beneficiaries, albeit a minority, have done very well.

Production constraints

The report suggests that poor production management may be one reason for "such poor performance"; and says that infrastructure problems, especially water availability, "hampered production considerably". Other constraints noted were:

- some beneficiaries lacked farm management and/or technical skills
- some had only small herd sizes when they were resettled and
- the lack of support for beneficiaries after they had been resettled.

Marketing

Eighteen percent of the beneficiaries surveyed had not marketed or consumed any livestock during 2003. Those that had "tend to market through auctions or direct sales to speculators or agents: more than 85% use this avenue". They generally market their livestock individually rather than in groups. The report suggests that beneficiaries are generally in a weak bargaining position and hence obtain low prices.

Economic analysis

The report observes that it is difficult to calculate the real costs and benefits of the resettlement scheme due to inadequate information about the production situation on acquired farms, both before (no data are available) and after resettlement. Nevertheless, it concludes on the basis of the limited information available that "If one considers that the objectives of resettlement are for beneficiaries to become self-reliant, to contribute to the national economy and to create jobs, then their current performance is not attaining these goals" It estimates that low off-take rates for cattle (and presumably also for small stock) are resulting in annual production losses of about N$120 000 per resettlement farm. Scaling up this estimate to cover all 120 resettlement farms, and also the government's targeted area of 9.5 million hectares, it estimates production losses of N$14 508 000 and N$191 384 700 respectively. The report emphasises that these estimates are not meant to be used as an argument against resettlement, but rather to highlight the urgent need to address the problems and constraints associated with resettlement.

4. Stephanus, K. and Sumaila, U. (2004) *Intergenerational Cost Benefit Analysis of Smallholder Farming Models in Namibia – Report of Analysis*. Consultant report prepared on behalf of the PTT, Ministry of Lands, Resettlement and Rehabilitation, Namibia.

This study describes its objective as to critically evaluate the costs and benefits of the smallholder farm models (1 000 ha and 3 000 ha) used in the MLR resettlement programme, based on an analytical framework for computing the net benefits from smallholder farms using both conventional and intergenerational CBA approaches and a discount rate of ten percent. The study analysed nine resettlement farms, from a range of AEZs, details of which were obtained from the national resettlement survey. It compared the total weights of the herds on these farms with the estimated carrying capacity to calculate the extent to which the capacity of the farms was being utilised, finding that seven of the farms were not being fully utilised and could have supported more livestock. The calculations were then extrapolated to all 50 farms covered in the national resettlement survey. Some of the key results are summarised in the following table, which is reproduced from the report.

Table 7.2: Estimated contribution to GDP of total resettlement farms (N$ million)

Capacity level	Conventional CBA		Intergenerational CBA	
	99 year lease period	Annual	99 year lease period	Annual
Current	104	1.05	156	1.68
Full	175	1.77	262	2.65
Opportunity cost	71	0.72	106	0.97

Eight of the nine farms were found to produce positive NPVs over the 99-year lease period, giving positive residual value (that is, land price) to the land. The residual land value per hectare was found to be greater than the land price per hectare for six of the nine farms, meaning that in theory these six farms have the ability to pay for the land at current levels of output. The other three were all situated in prime farming areas, leading the authors to suggest that this may "have resulted in their over-pricing".

The authors included off-farm income in their analysis, which the resettlement survey data showed was a very important part of beneficiaries' incomes. The authors note that in "the absence of off-farm incomes most beneficiaries would not be able to survive from production output alone and in many cases our NPV estimates would be negative".

Comments

This study seems to present an excessively positive picture of the economics of land reform for the following reasons. Firstly, the inclusion of off-farm income as a benefit appears odd – this income could have been available to beneficiaries even if they had not been resettled. Secondly, the authors note that their NPV results "are the maximum potential contributions to the agricultural sector depending on what the resettled farmers earned before the resettlement". Is this a way of saying that they have assumed that the beneficiaries were earning nothing before resettlement? Thirdly, the costs included in their calculations are mainly variable costs, and fixed costs appear to have been excluded. For example, for most of the nine farms no fencing costs have been included – even in the cases where they have, the costs appear to include only maintenance and repair costs. Similarly, borehole costs were not included. In addition, the authors do not acknowledge that an increase in utilisation capacity of the farms could well be accompanied by a reduction in off-farm income (that is, to achieve that increase the beneficiary might have to devote more time to her/his farm, and hence less time to off-farm income generating activities).

5. Motinga, D., Wyk, K. van., Vigne, P., Kauhika, S. and Visser, W. (2004) *National Small Stock Situation Analysis* Report prepared in draft form for MAWRD, MTI, the Meat Board of Namibia, the NAU and the NNFU.

This report contains a comprehensive overview of production and marketing aspects of Namibia's small stock sector, covering both commercial and communal production systems: however, there is no specific reference to resettlement farms. Annexure 2 contains detailed gross margin analyses for sheep (Dorper and karakul) and goat enterprises. Chapter 5 contains a discussion of production issues; and also a comparison of gross margins for different enterprises in climatically good, normal and bad years, part of which is reproduced below.

Table 7.3: Risk analysis comparison between Boer goats, Dorper sheep and Karakul sheep

Climate	Probability	Gross Margin (N$)		
		Boer goats	Dorper sheep	Karakul
Good	0.4	230	196	109
Normal	0.2	200	136	95
Bad	0.4	140	59	60
Expected values				

Source: National Small Stock Situation Analysis, citing Van Wyk (1995).

7.2 Financial analysis of individual schemes

7.2.1 Investment costs

Although the farm infrastructure is supposed to be in good condition when the farm is bought, this is not always the case, so the farmer may face some substantial repair costs around the time he or she occupies the farm or soon afterwards.

Depending on the size of the farm, the farmer may also need to acquire a substantial additional number of livestock early on if they are to utilise the farm to its full potential.

7.2.2 Financial viability

Gross margins are given in the following sub-sections for Boer goats, Dorper sheep and cattle – the three main enterprises of government-resettled farmers. Most of these farmers, including the ones we interviewed, do not produce Karakul, and gross margins for Karakul are discussed in the chapter on AALS farmers. Crop gross margins are also considered in the AALS chapter, as crop production by individual resettled farmers is very limited.

7.2.2.1 Gross margins

7.2.2.1.1 Gross margins for goats in Maltahöhe

The following table summarises some primary and secondary data pertaining to gross margins for goats, with particular reference to Maltahöhe district. The secondary source is the National Smallstock Situation Analysis (called the Smallstock Report in the table) that was published in 2004. Most of the data are for a good year (when good rains have produced good veld, kid mortality is on the low side), but the final column contains data for a bad year.

Table 7.4: Goats: Comparison of field data and Smallstock 2004

Parameters	**Good year (and good prices) – medium**			**Good year-high**	**Good year-high**	**Bad year-medium**
	GR1	**AA2**	**GR Group**	**Smallstock report 2004**	**Smallstock report 2006****	**GR group**
No. of breeding does	197	120	100	100	100	100
Conception rate (%)			*90*			*60*
Kids born	200	128	162	160	160	108
Survival rate (%)	*83*	*75*	*75*	*90**	*90**	*65*
Kids surviving	166	96	121.5	144	144	70.2
Price liveweight (N$)	400	550	325	320	500	135

Gross output/doe	***337***	***440***	***395***	***461***	***720***	***95***
Replacement costs	60	82.5				
V. Costs – veterinary	10	42		26.8		
V. Costs – feedstuffs	3	40		35		
V.C – ram purchases				8.6		
V.C. – market transport ($8.5/goat)		6.8		12.2		
Eartags		1.36		2.45		
V. Costs – total	73	166		85.05	102	
Gross margin/doe	***264***	***267***		***376***	***618***	

* optimistic; ** In this column variable costs have been increased by 20% and a higher liveweight price has been assumed.
GR = Government Resettled farmer / group; AA = Affirmative Action Loan Scheme farmer

The next table contains assumptions developed for modelling purposes for three different levels of management, and for good, bad and average years. In calculating "average years", it has been assumed that good and bad years occur with equal frequency. At the high management level, goats are sold at auctions, hence transport and ear tag costs are incurred, whereas at the medium and low management levels goats are sold to visiting traders so these costs are not incurred.

Table 7.5: Goats: Modelling assumptions for three management levels in good, bad and average years*

	Low			**Medium**			**High**		
	Good	*Bad*	*Aver*	*Good*	*Bad*	*Aver*	*Good*	*Bad*	*Aver*
Kidding rate/doe	1.2	0.8	1	1.4	1.0	1.2	1.6	1.1	1.35
Survival rate (%)	65	55	60	75	65	70	90	70	80
Kids surviving	0.78	0.44	0.6	0.9	0.5	0.84	1.44	0.8	1.08
Price liveweight (N$)	300	125	212.5	360	150	255	500	230	365
Gross output/doe(N$)	234	55	127.5	324	75	214.2	720	184	394.2
V. Costs – veterinary	15			25			27		
V. Costs – feedstuffs	10			20			35		
V.C – ram purchases	3			6			9		
V.C. – market transport	0			0			12		
Eartags				0			2.5		
V. Costs – total	28	28	28	51	51	51	85.5	85.5	85.5
Gross margin/doe(N$)	206	27	99.5	273	24	163.2	634.5	98.5	308.7

7.2.2.1.2 Dorper sheep in Maltahöhe

The following table summarises some primary and secondary data pertaining to gross margins for Dorper sheep.

Table 7.6: Dorpers: Comparison of field data in good year and Smallstock 2004

Parameters	**Good year – medium**			**Good year-high**	
	GR1	**AA2**	**GR focus Group**	**Smallstock report 2004**	
				2003price	2006price
No. of breeding ewes	34	180	100	1000	1000
Conception rate (%)			*80*		
Number of lambs born	34	180	105	1100	1100
Survival rate (%)	*100*	*80*	*75*	*90*	*90*
No. of lambs surviving	34	144	79	990	990

Price liveweight (N$)	300	375	350	227	350
Gross output/ewe	*300*	*300*	*221*	***225***	***346.5***
Replacement costs					
V. Costs – veterinary	38	17		9.1	
V. Costs – feedstuffs	4	0		20.5	
V.C – ram purchases				20.0	
V.C. – market transport ($8.5/sheep)	0	5		8.4	
Eartags	0	1		1.68	
Other	0	0		1.27	
V. Costs – total	*42*	*23*		*61*	*73.2*
Gross margin/ewe	***258***	***277***		***164***	***273.3***

GR = Government Resettled farmer / group; AA = Affirmative Action Loan Scheme farmer

The next table contains assumptions developed for modelling purposes for three different levels of management, and for good, bad and average years.

Table 7.7: Sheep: modelling assumptions for three management levels in good, bad and average years

	Low			**Medium**			**High**		
	Good	*Bad*	*Aver*	*Good*	*Bad*	*Aver*	*Good*	*Bad*	*Aver*
Lambing rate/ewe	0.9			1.0			1.1		
Lambs born									
Survival rate (%)	0.75			0.8			0.9		
Lambs surviving	0.675			0.8			0.99		
Price liveweight (N$)	300			325			350		
Gross output/doe(N$)	**202.5**	**100**	**152**	**260**	**130**	**195**	**346.5**	**175**	**262.5**
V. Costs – veterinary	10			27			9.1		
V. Costs – feedstuffs	2			2			20.5		
V.C – ram purchases	10			15			20.0		
V.C. – market transport	0			5			8.4		
Eartags	0			1			1.68		
Other							1.27		
V. Costs – total	22			50			*61*		
Gross margin/doe(N$)	**180**	**78**	**130**	**210**	**80**	**145**	***286***	**115**	**200**

7.2.2.1.3 Comparison of goat and Dorper gross margins

The following table summarises the gross margins for goats and Dorper sheep at different levels of management to facilitate comparison. It shows that at the medium and high levels, the GMs for goats are higher, but at the low management level it is lower. Boer goats have higher kidding/lambing rates in their favour. However, to some extent this advantage is cancelled out by the fact that the mortality rates of lambs tend to be lower than those of kids: Dorpers are arguably more robust than Boer goats.

The fact that Boer goats have higher gross margins than Dorpers does not mean that resettlement farmers should switch from farming Dorpers to farming Boer goats. A combination of enterprises carries a lower risk than being entirely dependent on one, and Boer goats require a higher level of management skills. In addition, having a large herd of goats can have a negative effect on the veld.

Table 7.8: Comparison of goat and Dorper gross margins

Smallstock enterprise	Management levels		
	Low	Medium	High
Boer goats	100	169	309
Dorper sheep	130	145	200

7.2.2.2

7.2.2.2.1 Gross margins for livestock in Otjozondjupa

Cattle

The following table contains gross outputs and margins for cattle derived from data provided by a government resettled farmer and an AALS farmer. The live weight price given by the former was very high, and has been replaced here by a more typical price. The final column contains a hypothetical set of assumptions intended to characterise a high level of management: it combines a high conception rate with a high survival rate, and has slightly higher variable costs and output price. In calculating these gross margins it has been assumed that the revenue from the sale of culled animals is equal to the cost of purchasing replacement animals: as the two items cancel each other out, they do not affect the gross margin and hence have not been included.

Table 7.9: Gross outputs and margins for cattle in Otjozondjupa

Parameters	GR2	AA1	High
No. of breeding cows	28	272	100
Conception rate (%)	*89.3*	*80.1*	*95*
Number of calves born	25	220	95
Survival rate (%)	*88*	*95.5*	*95*
No. of calves surviving	22	210	90.25
Price liveweight (N$)	1700	1650	1750
Gross output/cow	*1335*	*1274*	*1579*
V. Costs - veterinary	110	147	150
V. Costs – feedstuffs	155	208	215
V.Costs – transport	15	18	19
V. Costs – total	280	373	384
Gross margin/cow	*1055*	*901*	*1195*

GR = Government Resettled farmer / group; AA = Affirmative Action Loan Scheme farmer

7.2.2.3

7.2.2.4 7.2.2.2 Herd sizes and farm utilisation factors

In order for farmers to achieve financial viability they need to maintain herd sizes that enable them to manage their farms at reasonably high capacity utilisation levels. In other words, if a farm's carrying capacity is such that it can support a herd of, say, 800 cattle, then the farmer is unlikely to achieve financial viability with a herd of only 200 cattle and a capacity utilisation factor of only 25%. When the government resettles farmers, the farmers bring a certain number of livestock with them to the farm. This number is usually far below the carrying capacity of the farm. Thus, it is necessary – or at least desirable – for farmers to build up the sizes of their herds rapidly. The following table shows the changes in herd sizes and composition achieved by the four respondents since they were resettled in 1999 or 2000.

Table 7.10: Evolution of herd sizes (adults only) and composition

Year	1999/2000	2004	2006
Maltahohe			
GR1	• 28 sheep • 70 goats • 5 cattle	• 45 sheep • 170 goats	• 53 sheep • 207 goats • 2 donkeys • 6 horses
GR2	• 65 goats • 4 cattle	•	• 38 goats • 8 cattle
Otjozondjupa			
GR1	• 5 goats • 2 pigs	• 32 goats • 25 cattle • 20 pigs	• 65 goats • 48 cattle • 40 pigs
Gr2	• 12 sheep • 48 goats • 30 cattle	• 60 cattle	• 6 sheep • 35 goats • 26 cattle

Two farmers expanded their herds substantially; the other two have not expanded their herds at all. This is perhaps easier to see when we look at changes in the total value of the herd, as shown in the next table. These herd values are based on the following assumptions about the value of adult animals of various types: 1 sheep = N$400, 1 goat = N$720, 1 cow = N$3 400, 1 pig = N$400, 1 donkey = N$1 000, 1 horse = N$3 000.

Four individual resettled small stock farmers out of five who participated in a FGD in Maltahöhe were asked if they thought their farms could support larger herds than they currently support. Three of them thought they could (see table below), whereas one thought she was already overstocking.

Table 7.11: Small stock farmers' herd sizes (recent/current), farm sizes and potential herd sizes

Farm household	**Smallstock**				**Farm size (Ha) – farmer (official) estimate**	**Potential herd size – farmer estimate**
	Goats		*Sheep*			
	Adult	Total	Adult	Total		
Cinana	90	250			2048	400 (+150)
Friedricks	200	350	25	35	1935 (3120)	400 (+15)
Jacobs	130	150	40	70	1876	200 (-20)
Freeman	200	c300	53	c70	2900	
Romanna	25	38			3028	200-300 goats (+162-262), 25-30 cattle (+10-15)

In the following table, a comparison has been made between actual livestock numbers and units, and estimated carrying capacity for the Maltahöhe farmers we interviewed. If we assume that the official farm size for Fredriks' farm is correct, then the utilisation capacity of four of the five farmers is in the range of 44% to 52.5%, while the figure for the fifth farmer is only 19.5%. Alternatively, if the lower farm size for Fredriks is correct, then the mean utilisation factor is 49.6%.

Table 7.12: Farm utilisation capacity (percent) of small stock farmers in Maltahöhe, assuming carrying capacity of 9 kg/ha

Farm	**Weight of herd (kg)**			**Farm size (ha)**	**Full capacity (kg)**	**Capacity utilisation (%)**
	Small*	**Large****	**Total**			
Cinana	8120		8120	2048	18432	44.1
Fredriks	14550		14550	1935 (3120)	17415 (28080)	83.5 (51.8)

Jacobs	8140		8140	1876	16884	48.2
Freeman (GR1)	13700		13700	2900	26100	52.5
Romanna (GR2)	1721	3580	5301	3028	27252	19.5

*Assumes weight of 60 kg for adult small stock, and 17 kg for young ones

**Assumes weight of 360 kg for adult large stock, and 100 kg for young ones

Our capacity utilisation figures can be compared with those calculated by Stephanus and Sumaila for the southern regions: three of their farms are in the range 55% to 63%, and one is 91%. Their figures are about 10% higher, but the general pattern is the same – most farms appear to be substantially under-utilised.

Table 7.13: Farm utilisation capacity (%) of farmers in Hardap and Karas Regions

Farm	Regions	Total Farm size (ha)	Carrying Capacity (kg/ha)	Weight of herd (kg)*	Full capacity (kg)	Capacity utilisation (%)
Gomaub Sud	Hardap	6819	18	23720	40913	58
Hainabis	Karas	10112	8	25500	40449	63
Sperlingsputs	Karas/ Real South	27802	5	25320	46337	55
Tsachanabis	Karas	10511	5	24010	26257	91

*Assumes weight of 50 kg for small stock units and 380 kg for large stock units

A comparison has also been made between actual livestock numbers and units, and estimated carrying capacity for the two resettled farmers interviewed in Otjozondjupa. One farmer had a very high utilisation factor; the other had a very low one. A major reason for the very low one was that this farm was located adjacent to a communal area, and youths from the communal area had been stealing his cattle. In addition, neither he nor any of his family lives on the farm, and it may be that his farm labourers are less vigilant or resistant to thieves than family members would be.

Table 7.14: Mixed livestock farmers' herd sizes (recent/current) and farm sizes in Otjozondjupa

Farmer	Smallstock		Cattle		Farm size (Ha)
	Adult	Total	Adult	Total	
GR1	32	38	12	28	1400
GR2	100	200	28	52	1028

GR = Government Resettled farmer

Table 7.15: Farm utilisation of GR farmers with mixed livestock in Otjozondjupa

Farmer	Smallstock (Kg)		Cattle (Kg)		Total weight of herd (kg)	Potential herd weight *** (kg)	Utilisation (percent)
	Adult	Total	Adult	Total+			
GR1	1920	2464	4320	5340	7804	28000	28
GR2	6000	6700	10080	12480	19180	20560	93

GR = government resettled farmer

*Assumes weight of 60 kg for adult small stock, and 17 kg for young ones

**Assumes weight of 360 kg for adult large stock, and 100 kg for young ones

*** Assuming carrying capacity of 9 kg/ha (6ha/SSU) in Maltahöhe, and 20 kg/ha (1ha/LSU) in Otjozondjupa

+ Assumes number of young small stock is same as number of adults, and young cattle is 85% of adult population

7.2.2.5 Farm budgets

The following table shows farm budgets estimated for the farmers interviewed. The calculations are based on income (production and output price) data for 2005/06; and the depreciation figures are annual averages over the lifetimes of the fixed assets.

Table 7.16: Farm budgets for resettlement farmers interviewed, based on production and income data for 2005/06 (N$)

	Maltahohe: Smallstock		Otjozondjupa: Cattle	
	GR 1	**GR 2**	**GR 1**	**GR 2**
Total gross margin	**64,848**	**11,044**	**16,840**	**91,660**
- Depreciation of fixed assets (30 years)	9,082	12,317	5,033	5,487
- Maintenance of fixed assets	6,180	2,000	71,600	4,150
- Fuel for car, pumping etc	8,640		25,344	7,680
- Other overhead costs				1,500
= Value added	**40,945**	**-3,272**	**-85,137**	**72,843**
- Wages			22,644	25,200
= Net Farm Income/Profit	**40,945**	**-3,272**	**-107,781**	**47,643**

GR = Government Resettled farmer

The two Maltahöhe farmers have higher depreciation costs than the two in Otjozondjupa, which is largely a reflection of the fact that they have larger farms and hence higher fencing costs. Wages have not been included for the small stock farmers as they both rely entirely on family labour, including that of the owner. SS2 has no fuel costs because she does not have a motorised vehicle, relying on horses and donkeys for transport. The maintenance and fuel costs of 'Cattle 1' have probably been exaggerated by him. On the other hand, those of the other three farmers are surprisingly low and suggest that they may not be maintaining their assets properly: indeed, SS2 said that the condition of her fencing was not good, as she could not afford to repair it or buy new fencing. This situation could represent a financial "time bomb" because their assets will reach the end of their useful lives, and need replacing, more quickly.

Two of the farmers have total gross margins of less than N$20 000, and the other two have gross margins of more than $60 000. The two farmers with low gross margins have negative net farm incomes, while the two with the higher GMs have positive net farm incomes. This does not necessarily mean that both farmers with negative net farm incomes are actually making a loss each year. The depreciation costs are notional, and represent the amount of money that farmers should be saving annually to ensure that when the fixed assets need to be replaced the necessary funds will be available. SS2 would have a positive net farm income if her depreciation costs were excluded. It seems likely that few if any resettled farmers **are** saving this amount of money – most of them may not be able to afford to do so, and doubts about their legal rights to the farm in the long term may discourage them from doing so.

Sensitivity analysis

Farm budgets have been calculated for farms with a carrying capacity of 9kg/ha, at both low and high levels of farm capacity utilisation, i.e. about 50 and 80 percent respectively. The low capacity utilisation scenario reflects the situation that was found on most farms in Maltahöhe and the assumption of 80% in the high capacity scenario allows for the need to maintain a "safety margin" in case of drought. The sur-

vey showed that all farmers interviewed in Maltahöhe owned primarily or entirely goats, and that sheep were secondary. This is reflected in the assumptions for this scenario about numbers of animals owned, which are 200 Boer goats and 50 Dorpers.

In the high capacity utilisation scenario, the total herd size increases from 250 to 400 animals. Bearing in mind the potential for large numbers of goats to have a detrimental impact on the veld, it has been assumed that the increase is entirely in sheep numbers, that is from 50 to 200.

The assumptions about fixed costs are the same for both scenarios and for all three management levels, and are shown in the following table. It has been assumed that annual maintenance of fixed assets is equivalent to 10% of the initial capital cost of the asset. This is rather low – some people assume 20% to 25% – and reflects the low actual maintenance and repair costs reported by resettlement farmers. It has also been assumed, in calculating the annual depreciation costs of the fixed assets, that their lifetime is 30 years.

Table 7.17: Costs related to fixed assets for 3 000 ha small stock farm

Fixed asset	Maintenance - @10% of purchase cost (N$)	Number of units (km is unit for fencing)	Unit cost (N$)	Purchase cost (N$)
Boundary fencing	9,900	22	*9,000	**99,000
Camps fencing	5,850	**13	4,500	58,500
Boreholes	15,000	2	75,000	150,000
Dams, pipes & troughs	9,600	3	32,000	96,000
Pump & engine	1,600	1	16,000	16,000
Total	41,950			419,500

* Assumes the boundary fencing is "jackal-proof", and hence more costly than internal camp fencing.
** Assumes that the farm borders other farm(s) and that the costs of the boundary fencing are equally shared between the farms.
*** Assumes there are five camps on the farm – four camps is a minimum and would require 11 km of fencing.

The sum (N$66 833) of the total annual fixed cost maintenance cost, the annual fixed cost depreciation cost and the annual fuel costs (see following table), is subtracted from the gross margins to arrive at the "Value Added" figure

Depreciation of fixed assets (30 years)	N$13 983
Maintenance of fixed assets	N$41 950
Fuel for car, pumping etc	N$10 900
Total	N$66 833

The gross margin calculations are for an average year, and are based on the assumptions for goats and sheep that were described earlier for low, medium and high levels of management. Farmers resettled under the government scheme frequently rely on family labour rather than hired labour, and may not see that labour as a cost. If it is not treated as a cost, then the net farm income (also the profit in these cases, as there are no interest payments on loans) is the same as the value added. If the labour were hired then the annual cost would be about N$7 000 per labourer.

The calculations show that the value added is only positive for farmers with high management skills, in each of the two scenarios. If labour costs were included, then only high management farmers in the high

capacity utilisation scenario would make a profit. Currently, it is probably the case that only a small minority of resettled small stock farmers have both a high level of skills and high capacity utilisation. **These findings underline the importance of providing assistance to resettled small stock farmers to enable them to move into a "high management skills, high capacity" situation.**

Table 7.18: Farm budgets for 3 000 ha small stock farms at different management levels and low (c.50%) and high (80%) capacity utilisation levels

	Low capacity utilisation			High capacity utilisation		
	Low	**Medium**	**High**	**Low**	**Medium**	**High**
Total gross margin	**26,400**	**39,890**	**71,815**	**45,900**	**61,640**	**102,040**
Value added (Gross Margin - fuel costs, depreciation & maintenance of foxed assets)	**-40,433**	**-26,943**	**4,982**	**-20,933**	**-5,193**	**25,207**
- Wages	0	0	0	0	0	0
= Net Farm Income/Profit	**-40,433**	**-26,943**	**4,982**	**-20,933**	**-5,193**	**25,207**

Mixed livestock in Otjozondjupa

Gross margins for sheep and goats Drought is infrequent in Otjozondjupa and none of the farmers interviewed there cited it as a constraint. Thus, the gross margins assumed for farmers in this region are those given earlier for a good year (as opposed to an average year) in Maltahöhe, and are summarised in the following table.

Table 7.19: Small stock gross margins in Otjozondjupa

Smallstock enterprise	**Management levels**		
	Low	**Medium**	**High**
Boer goats	206	273	634.5
Dorper sheep	180	210	286

As stated earlier, the gross margins used for cattle are N$901, N$1 055 and N$1 195 for the low, medium and high cases respectively.

Table 7.20: Costs related to fixed assets for 1 000 ha mixed livestock farm

Fixed asset	Maintenance - @10% of purchase cost (N$)	Number of units (km is unit for fencing)	Unit cost (N$)	Purchase cost (N$)
Boundary fencing	5,760	13	*9,000	**57,600
Camps fencing	3,150	***7	4,500	31,500
Boreholes	7,500	1	75,000	75,000
Dams, pipes & troughs	3,200	1	32,000	32,000
Pump & engine	1,600	1	16,000	16,000
Bakkie	4,000	1	40,000	40,000
Total	25,210			252,100

* Assumes the boundary fencing is "jackal-proof", and hence more costly than internal camp fencing.

** Assumes that the farm borders other farm(s) and that the costs of the boundary fencing are equally shared between the farms.

*** Assumes there are four camps on the farm

The sum (N$44 513) of the total annual fixed cost maintenance cost, the annual fixed cost depreciation cost and the annual fuel costs (see following table), is subtracted from the gross margins to arrive at the "Value Added" figure.

Capacity utilisation factors of 60% and 90% (as opposed to 50% and 80% for a small stock farm) have been assumed because drought is infrequent, and hence a reserve margin is not necessary. The assumptions about the numbers and types of livestock kept reflect the survey findings – it has been assumed that each farm has two enterprises, goats and cattle, and that the ratio of goats to cattle is 3:1. The numbers of each are given in the following table.

Table 7.21: Livestock numbers for 1 000 ha mixed livestock farms in Otjozondjupa

	Low capacity utilisation (60%)	High capacity utilisation (90%)
Numbers of Goats	66	100
Numbers of Cattle	20	30

The value added is positive in all three of the high capacity utilisation scenario and the high management case in the low utilisation scenario, as shown in the following table. After subtracting wages (of three farm workers) only two cases, high management and high utilisation and high management and low utilisation, have a positive net income. However, a large proportion of resettled farmers live on the farm and rely primarily, if not entirely, on family labour, which is often not perceived by them as a cost in the way that they view other costs.

Table 7.22: Farm budgets for 1 000 ha mixed livestock farms in Otjozondjupa

	Low capacity utilisation			High capacity utilisation		
	Low	Medium	High	Low	Medium	High
Total gross margin	**31,616**	**39,118**	**65,744**	**47,630**	**58,950**	**99,250**
Value added	**-12,897**	**-5,395**	**21,231**	**3,117**	**14,437**	**54,737**
- Wages	21,000	21,000	21,000	21,000	21,000	21,000
Net Farm Income/Profit	**-33,897**	**-26,395**	**231**	**-17,883**	**-6,563**	**33,737**

7.2.3

7.2.3.1 Farm size

7.2.3.1.1 Fixed costs and farm size

The relationship (or ratio) between the main fixed costs (fencing, water infrastructure) and farm size is not a constant one – fixed costs are disproportionately high for small farms, and hence so are the maintenance and depreciation costs associated with them. This is illustrated by a hypothetical example in the following table. In this example, the ratio between livestock production parameters and revenue, on the one hand, and farm size, on the other, is constant; but the costs are disproportionately higher on the smaller farms, and Farm C makes a loss.

Table 7.23: Fixed costs and farm size

	Farm A	Farm B	Farm C
Farm size (ha)	5000	2000	1000
Number of LSU	500	200	100

Annual offtake (@ 35%)	175	70	35
Gross return (N$)	**409500**	**163800**	**81900**
Infrastructure (fencing, water & buildings)	1334571	781604	597282
Other c apital (machinery, vehicle)	400000	350000	350000
Maintenance and depreciation – infrastructure @ 22-23% of capital costs	60729	34580	25864
Maintenance and depreciation – other capital @ 14.28% of other capital costs	28000	24500	24500
Variable costs (veterinary, feedstuffs, etc) @ 40% of gross income	163800	65520	32760
Labour	38400	15360	7680
Cost of production	**290929**	**139960**	**90804**
Net farm income (before tax and interest)	***118571***	***23840***	***(8904)***

Source: Adapted from NAU, 2003

The results of the farm budget modelling in the previous section suggest that farmers can make a profit from farms of the current minimum sizes (3 000 ha in the south and 1 000 ha in the central, northern and eastern regions), provided they have a high level of farm management skills and a high capacity utilisation factor. However, making a profit with farms of these sizes is highly challenging, and the minimum farm sizes should not, therefore, be reduced. They should also be applied rigorously – we came across farms in the south that were smaller than the 3 000 ha minimum.

The fieldwork findings showed that for most small stock producers in the south, and also for some resettled farmers in the north, farm size is not the most pressing constraint. The main issue is that these farmers are not able to make the most of the land they have, because:
(a) They have been unable to build up their herds to the level that they think their farm can support; and
(b) they are unable to utilise all of their land due to a lack of functional water points on parts of their farms.

There are two main reasons why farmers have not been able to build up their herds. One reason is the lack of capital to purchase additional animals and the other is the poor livestock productivity they have experienced in most recent years due to drought.

7.2.3.1.2 Household income and farm size

Some people argue that the determination of a minimum farm size should be based on a minimum household income. For example, the PTT argued: "'Economic farming units' are not simply a matter of economics. There is a cut-off point below which a piece of land cannot be farmed on an economically viable basis. However, any size above this absolute minimum depends on the economic expectations people have." The PTT concluded that "Expected incomes from allocated land and resultant 'economic units'...need to be negotiated by all stakeholders".

However, farming for a living is not like earning a regular salary as a government employee or a labourer on a long-term contract: unlike these kinds of occupations, there are serious risks associated with farming and the possibility of major fluctuations in income and expenditure over time. It is more like managing a medium-sized business, as the NAU has argued (NAU, 2003); and as such, the farmer needs to have sub-

stantial financial reserves and good access to credit – which most resettled farmers do not have. The smaller the farm, the less resilient it is likely to be, but if resettlement farmers had easier access to credit they would be in a stronger position in two ways – firstly, they would have a better chance of stocking and utilising their farms to their full potential; secondly, they would be better placed to cope with shocks like drought or an engine breaking down, . In other words, the profitability and robustness of a farm of a given size depends partly on the support services available to farmers (both financial and technical), and minimum farm size cannot be determined independently of the institutional environment.

7.2.3.2 Household income, farm Income and diversification

Resettled farmers and minimum household income

There has been some discussion in the resettlement literature about household income in relation to a decent standard of living. A number of reports during the past eight years have cited a figure of N$15 000 as a minimum household income. A 1998 report by the Farming Unit Advisory Committee (FUAC, 1998) may be the first to have used this figure. The report stated:

"According to the statistics obtained, the minimum cost of living to ensure a decent livelihood is estimated at N$12 442.00 per household per annum. The average size of households in Namibia is estimated at 5.7 persons. In order to apply a realistic norm, the minimum cost of living for the purpose of cash-flow projections is determined at N$15 000.00 per household per annum".

In 2002, the GFA terra systems report also referred to "the minimum income level of N$15 000 required to provide a 'decent standard of living' for a household of 5 to 6 people as indicated by the Central Bureau of Statistics". More recently, the PTT report referred to "...the decent living income level proposed by the National Planning Commission (N$15 000 p.a. for a household of five people)".

Resettlement farmers' sources of income

Whatever the minimum income level, it is important to recognise that this income does not necessarily have to come from one source. There has been a general trend in sub-Saharan Africa towards rural households having multiple sources of income, with agriculture being part of a portfolio of livelihood activities. In this context, farms do not have to be able to generate all of a household's income. The survey findings show that all four of the farmers interviewed have other sources of income, and for the two in the north (both of whom are schoolteachers in Windhoek) the other sources are more important.

Table 7.24: Farmers' sources of income (ranked by farmers)

	Maltahohe		Otjozondjupa	
Sources of income	**1**	**2**	**1**	**2**
Farm enterprises	1	1	2	2
Salaried job			1	1
Pensions	2	2		
Remittances	3	3		

These findings are in line with those of the PTT, which noted that off-farm income is very important to beneficiaries, and which found that only 31% of farmers surveyed viewed farming as their main occupa-

tion (PTT, 2005b). According to the PTT, "Most beneficiaries regarded farming as a part-time occupation …7% described their main occupation as pensioners, while 12% indicated self-employment and 45% of all beneficiaries were wage earners". The PTT went on to note that 74% of the wage earners were government employees based mainly in Windhoek. The PTT found that the average annual income earned from off-farm occupations was N$51 000 and concluded that most beneficiaries could be classified as "lower-middle income households".

(N.B. The published PTT reports did not identify any regional differences in the patterns of income sources, but our small sample suggests that there may be. a higher concentration of wage earners in the north than in the south. Staff in the Otjozondjupa regional office suggested that 95% of the beneficiaries in that region were wage earners, most of whom were based in Windhoek. In Maltahöhe we met three resettled farmers: one of them had a husband based in Windhoek, but the other two were married couples living on their farms. If there are regional differences, this would seem to imply that the respective regional resettlement commissions have applied selection criteria in different ways and/or that different kinds of prospective resettlement beneficiaries have different regional preferences.)

The PTT reasoned that farming can be very difficult and that this resulted in diversification of income sources by forcing "some beneficiaries to look for alternative off-farm income" (PTT, 2005b). While this may be an important dynamic, our fieldwork suggests that other processes have also been at work. We found that those with regular off-farm income sources had those sources before they were resettled – that is, they were not forced to look for them because they found farming to be difficult. On the other hand, those in the south were mainly pensioners, and hence were not looking for full-time jobs, and nor were they necessarily looking for casual off-farm income. However, they did appear to be struggling to make a living from farming. In both cases their sons were working full-time on the farm, but in one case the sons (who were literate and spoke reasonable English) said that they had applied for jobs elsewhere but had not been successful.

Whatever the reasons for diversification of income sources, the fact remains that the majority of resettled households do not regard farming as their main occupation and for 71% of beneficiaries, off-farm income is the main source (PTT, 2005b). In the drought-prone southern regions of the country, diversification of household income sources so that they include a combination of on-farm and off-farm sources is highly desirable as a risk-spreading strategy to enable households to become less vulnerable to drought. This is part of the government's national drought policy, which states that "... the Government will look into ways that it can support farmers to move into new activities like wildlife management, tourism, charcoal production and small secondary industries … In addition, Government policies with respect to rural employment will be implemented vigorously, particularly regarding micro credit, and small and medium enterprise development" (National Drought Policy and Strategy, National Drought Task Force, November 1997.)

7.2.4 Financing

Unlike AALS farmers, resettled farmers are fortunate in not having to purchase their farms and repay a loan. However, they are likely to need credit for various other purposes – such as purchase of inputs, unexpected repair costs or buying livestock to build up their herd sizes. Our field survey supported the PTT survey finding, that "access to credit for farming purposes was negligible in most cases".

Beneficiaries should receive a 99-year lease agreement from the MLR, but PTT found that "no leases have yet been registered, thus preventing beneficiaries from using them as collateral for credit access purposes". However, even if a beneficiary did receive a lease agreement, the PTT stated that commercial banks may not accept this as sufficient security for credit. Resettled farmers with no other major source of income are seriously constrained by this situation, which inhibits both agricultural production and productivity; and many may be obliged to sell productive assets (small ruminants) to generate working capital. Farmers with another important income source may be able to draw on that from time to time to finance their farming operations and may also be deemed more creditworthy. One of the farmers we interviewed was a teacher, who had been able to obtain an Agribank loan to buy some livestock.

7.2.5 Marketing

In southern Namibia, livestock can be either sold to visiting traders or marketed at auctions. The main marketing channel for the resettlement farmers whom we interviewed was visiting traders; commercial farmers and AALS farmers generally sell their animals at auctions. A farmer calls a trader when he or she has several animals to sell, and the trader buys in bulk. Some animals were also sold in Maltahöhe, the nearest town. One reason for using this channel rather than auctions is that it saves the producer having to organise the transportation of the animals him or herself. Our respondents' farms were about 60 km from Maltahöhe, and one of them did not have any form of motorised transport. Another respondent said that he follows small stock prices by listening to information on the radio, which is presumably a significant advantage when negotiating with the traders. Most animals are sold when they are six to twelve months old.

Whichever marketing channel is used, most small stock are exported live to South Africa: over 90 % of the Namibian small stock marketed in South Africa come from southern Namibia. Goat prices are usually higher than sheep prices, and have been during the last four years (see www.agra.com.na). There are also substantial monthly variations, particularly in goat prices (Motinga et al., 2004). Karakul pelts are exported to Europe and sold at fur auctions – this will be discussed in the next chapter.

7.3 Economic analysis of individual schemes

7.3.1 Costs

The economic analysis uses the same conversion factors for costs and income or benefits as were used in the other chapters.

7.3.2 Benefits

Resettled farmers do not currently pay land tax and thus do not generate any revenue for the government. In fact, the transfer of a farm from a commercial farmer to the government may result in a reduction in revenue from land tax. There is not necessarily any benefit to the economy in terms of jobs created, as the resettlement beneficiaries may simply replace previous farm labourers with their own family or hired labour.

7.3.3 Economic viability

The following table gives the equivalent economic gross margins for Boer goats and Dorpers to those that were presented in the financial section. The economic gross margin for cattle is given in Chapter 8.

Table 7.25: Small stock economic gross margins in the south at different management levels

	Low		Medium		High	
	Boer	Dorper	Boer	Dorper	Boer	Dorper
Gross output	108.8	129.2	178.6	182.1	335.2	223.2
Variable costs	23.8	18.7	28.7	43.4	70.0	49.3
Gross margin	85.0	110.5	149.9	138.8	265.2	173.9

An economic analysis was carried out for the small stock and mixed livestock cases discussed in the previous section. The following table summarises the results for the small stock case. Value added and net farm incomes were positive in all three of the high capacity utilisation cases as well as in the high management/low utilisation case. The economic rate of return was positive for the same cases, ranging from 2.68% to 25.5%.

Table 7.26: Farm budgets for 3 000 ha small stock farm supporting 9kg/ha

	Low capacity utilisation			High capacity utilisation		
	Low	**Medium**	**High**	**Low**	**Medium**	**High**
Gross margin	**18,281**	**27,031**	**48,453**	**39,112**	**52,620**	**86,985**
Value added	**-14,374**	**-5,623**	**15,799**	**6,458**	**19,966**	**54,331**
- Wages	840.0	840.0	840.0	840.0	840.0	840.0
= Net Farm Income (& Return to capital)	**-15,213**	**-6,463**	**14,959**	**5,618**	**19,126**	**53,491**
Economic rate of return (ERR) (%)	**-7.25**	**-3.08**	**7.13**	**2.68**	**9.12**	**25.5**

The next table summarises the results for the mixed livestock case. Value added and return to capital were positive in all cases except for the low management/low capacity utilisation case. The economic rate of return was positive for the same cases, ranging from 2.09% to 25.59%.

Table 7.27: Farm budgets for 1 000 ha mixed (cattle and goats) livestock farm supporting 20kg/ha

	Low capacity utilisation			High capacity utilisation		
	Low	**Medium**	**High**	**Low**	**Medium**	**High**
Gross margin	**20,923**	**27,113**	**37,840**	**31,457**	**40,816**	**56,735**
Value added	**-2,712**	**3,479**	**14,206**	**7,822**	**17,181**	**33,100**
- Wages	840.0	840.0	840.0	840.0	840.0	840.0
= Net Farm Income (& Return to capital)	**-3,552**	**2,639**	**13,366**	**6,982**	**16,341**	**32,260**
ERR(%)	**-2.82**	**2.09**	**10.60**	**5.54**	**12.96**	**25.59**

7.3.4 Socio-economic impact and external effects

7.3.4.1 The management of natural resources on resettlement farms

As noted earlier, most of the resettlement farms we visited appear to be understocked, which should reduce pressure on the range. In addition, all but one of the farmers (whose farm had previously been a game ranch) said they had camps and were practising rotational grazing, which is intended to avoid overgrazing. However, we did not have time to inspect the condition of the veld on the farms we visited. The PTT also concluded that stocking rates did not exceed carrying capacity on most farms, and that most farmers apply some form of rotational grazing. However, a special study for the PTT found that some farmers do not have enough camps to do proper rotational grazing, as more than one family is usually settled at a water point. Veld deterioration still takes place due to continuous overgrazing (Kambatuku, 2004). The PTT also noted that in most cases, water quality and quantity had not declined since resettlement (PTTb, p 102).

7.3.4.2 Farmer income and wealth

The resettlement survey carried out by the PTT found that the average beneficiary had doubled his or her livestock herd and it was calculated that the average capital gain (in the form of livestock) over a 3.5-year period was N$59 000 (PTT, 2005b). Our figures cover a period twice as long as the PTT period, and could

be consistent with the PTT average. What our figures highlight is the huge variation within the average – two farmers achieving impressive increases in herd size and value, and two experiencing a decline. The negative cases raise questions about beneficiary selection and post-settlement support (or lack thereof).

Table 7.28: Changes in value of livestock assets over time (N$)

Regions and farmers	1999/2000	2006	Change in herd value (N$)	% Change in herd value	Annual change in herd value (%)
Maltahohe					
GR1	78,600	*190,240	111,640	+ 242	34.6
GR2	60,400	54,560	-5,840	- 10	-1.4
Otjozondjupa					
GR1	4,400	226,000	221,600	+ 5100	728
GR2	141,360	116,000	- 25360	- 18	- 2.6

*170,240 (smallstock) + 20,000 (equines); GR = Government Resettled farmer

7.3.4.3 Impact of resettlement farms on Namibia's livestock sector

It would be desirable to know how resettled farmers' production levels and productivity compare with those of commercial farmers. In principle, this could be done by comparing their performance with (a) that of the previous owners of the farms that have been resettled; or (b) with that of neighbouring farmers or farmers operating under similar agro-ecological conditions. Unfortunately, both of these comparisons are problematic.

The first is impossible because there are no records of the production levels of commercials farms prior to their acquisition by the MLR (PTT, 2005b). The second comparison is problematic because we do not know whether the previous performance of farms acquired by MLR is similar to that of other commercial farms. In fact, there is reason to assume that often it is not – the very fact that the owner decided to sell the farm suggests that the farmer may have been experiencing some difficulty. The PTT observed that "The government appears to buy farms in poor, run-down conditions and then pass them on in the same condition [to beneficiaries] … The reason for many such farms being offered for sale or donated to the government is probably because they could not be run at a profit due to poor range conditions, difficult terrain, low yields, poor quality groundwater or expensive maintenance of water infrastructure resulting from scaling and corrosion" (PTT, 2005b).

Despite making the above observation, the PTT compared the livestock production performance on the average beneficiary farm with what a farm could produce if it was "used to full capacity at average commercial production rates". From this, the PTT calculated the "production loss" for a single farm and scaled this up to all resettlement farms, describing it as the "production loss from current resettlement approach". For reasons stated earlier, we doubt the validity of this kind of comparison – or at least this kind of interpretation. We agree with the PTT that "the resettlement sector is characterised by low production levels" – although there may be exceptions – and that there is often scope for increasing productivity and production levels. We have reached the latter conclusion partly on the basis of what farmers have told us about their constraints and the stocking rates and production levels they think they could achieve, and partly on the basis of calculating potential stocking rates for specific farms and comparing them with actual rates, as described earlier.

Furthermore, recently resettled farmers may still be in the process of building up their herds, so low stocking rates may be a temporary situation for some of them. Having said that, many of the farmers we interviewed appeared to be facing constraints in building up their herds.

7.3.4.4 Impact on farm workers

When farms are purchased by the MLR they are usually allocated to people from another area, and the farm workers who had previously been living and working on the farm may be displaced. Beneficiary households who live on their farms tend to rely on family labour rather than hired labour, and even where the principal household member does not live on the farm, he or she may employ relatives to do the farm work rather than strangers – as in the case of one farmer whom we interviewed. Thus, the resettlement scheme may be failing to reduce the number of disadvantaged Namibians who do not have access to land and instead, may be increasing the pool of unemployed. Various authors, including the PTT, have argued that farm workers should be a priority target group under the resettlement programme, given their high levels of farm-related skills.

7.4 Constraints and recommendations – individual schemes

7.4.1 Overview

The following table summarises the constraints identified by respondents. Water supply problems were identified by all respondents, whilst drought was seen as a constraint in the south but not in the north.
Conflict with neighbours was only mentioned in the north, but this may be purely a matter of chance. GR1's conflict (see following table) was to do with theft, and arose from the fact that his farm was situated adjacent to a communal area. He said that youths from the communal area often stole his cattle. GR2's conflicts were with an adjacent resettled farmer, and were mainly concerned with lack of access to water on his land, although there were other matters too.

Access to capital for both infrastructural costs and operational costs was another key issue in the south, but was not mentioned by the two respondents in the north. It may be relevant that both of the respondents in the north were teachers (based in Windhoek) who said that their salaried income was more important than their farm income, whereas farmers interviewed in the south did not have salaried jobs and saw farming as their main source of income. In other words, having a salaried job (or other major income source) may improve farmers' access to capital so that this potential constraint is avoided.

Table 7.29: Main constraints identified by respondents

Constraint	Maltahohe: Smallstock			Otjozondjupa: Cattle	
	GR1	GR2	GR group	GR1	GR2
Production					
Difficulty in accessing credit for infrastructure	√	√	√		
Insufficient working capital/lack of credit	√	√	√		
Drought		√	√		
Water supply problems	√	√	√	√	√
Conflicts with neighbours				√-theft	√
Marketing					
Low prices for livestock/crops			√		

Distance to market			√		
Lack of vehicle to take animals to market (cost of hiring vehicle)		√			(√)
Need to make emergency sales			√		
Lack of market for crops					√

GR = Government Resettled farmer / group

7.4.2 Marketing

Respondents also identified various marketing constraints. Those in the south said that although prices at auctions were higher, they were obliged to sell to visiting traders because they faced various barriers to selling their animals at auctions. Firstly, a permit is needed in order to sell at auctions and to obtain a permit, a separate trip must be made to Maltahöhe, doubling your travelling distance. Secondly, transporting their animals to auctions in Maltahöhe and elsewhere is problematic. Thirdly, they only have small numbers of animals. Fourthly, auctions are only held locally once or twice a year, and a farmer may need to sell small stock at a time when there is no auction, to meet urgent cash needs.

Recommendation

A group of resettlement farmers made the following suggestion. If there were two individual farmers on two neighbouring farms with enough animals to sell, it may be worthwhile for an auction to be held once or twice a year on one of the farms. They said they would like the government to liaise with agents to enable this to happen.

7.4.3 Drought

Farmers in Maltahöhe District identified drought as a constraint. There are various ways of defining drought. The respondents appeared to be using the term in a broad sense to include a succession of two or more low rainfall years. The government argues that low rainfall years are normal, and that farmers should be able to cope with them through their own risk management strategies. The government has adopted the concept of the "disaster drought", which it says is an extreme event that occurs in a particular area in one year in 14 on average, and it is government policy to provide drought relief only in these years (National Drought Task Force, November 1997).

Drought is a constraint for livestock farmers in two ways. Firstly, the quality and quantity of forage vegetation is reduced, which tends to have a negative effect on the condition of the animals and hence results in lower prices for them. Secondly, drought requires farmers to reduce the size of their herds, which means that more animals come on the market, and this also leads to lower prices.

Drought is a fact of life for small stock farmers in the south of Namibia, and their livelihood and production systems need to be robust enough to cope with it. It may be highly localised, which means that having two farms in different localities can reduce vulnerability to drought, which is a strategy that some commercial farmers have used. It also means that the larger the farm, the more robust it is to drought, and hence government-resettled farmers are likely to be more vulnerable than commercial farmers, given the differences in farm sizes. Small stock farmers may need to develop alternative risk management strategies to those used by commercial farmers, such as diversification into more drought-proof income-generating activities, including off-farm activities.

Recommendations
We repeat relevant recommendations from the PTT report, namely:
"Farmers should be supported to adjust stocking rates to available fodder sources and to find alternative emergency grazing during times of disaster droughts..."; and
"Government should subsidise transport of livestock to and from emergency grazing areas during and after disaster droughts".

7.4.4 Water supply problems

Water supply problems can be grouped into two broad categories: those arising from beneficiaries not having a water point on their allotment or farming unit, and those due to beneficiaries having no water point on their land.

When a water point is not present
When large farms are divided up among several beneficiaries, it sometimes happens that one or more of the allotments does not have a water point on it. Beneficiaries whose allotments do not have a water point are then expected to obtain access to water from the one or more beneficiaries whose allotments do have water points. This obviously depends to some extent on goodwill. This situation was discussed by the PTT, which noted that the "need to cooperate with resettlement neighbours appears not to be discussed at all prior to resettlement" and that a "lack of cooperation amongst beneficiaries was extremely apparent" (PTT, 2005b). In our field work we came across a case of cooperation and another case of non-cooperation: in the latter case the farmer with the water point claimed that it was exclusively for his use and that his neighbour (whom we interviewed) had no right to water from it. Where such conflicts arise this "prevents farms from being utilised at an optimal level" (ibid).

When a water point is present
The table below summarises the range of problems and effects that were reported to us by resettlement farmers who had a water point on their farm, but were still experiencing water-related constraints. The effects on agricultural production can be summarised as follows:

- Livestock numbers are limited by the fact that some of the pasture land (in one case more than 50%) cannot be utilised.
- Livestock productivity is reduced (due to miscarriages – reported by two farmers, and probably other effects[11]) when animals have to walk longer distances to access water.

- Irrigated crop production is disrupted.

The constrained production and productivity have a financial effect that was reported to be substantial. Given the widespread occurrence of water-related constraints (see information below from PTT study), it may be, for example, that they are reducing resettlement farmers' total net income by 20% or thereabouts.

[11] Restricted access to drinking water can suppress animals' appetites, and the extra distance covered would burn calories and hence might reduce weight gain.

Table 7.30: Problems sometimes arising when water points are present on the farming unit

Constraints →	***1. Borehole equipment/or reservoir needs to be repaired***		***2. Water abstracted only by wind pump***	***3. Borehole not recharging***	
	Near home	Distant		Near home	Distant
Effects →	* Crop irrigation ceases	* Area of farm close to water point not usable for grazing	When there is no wind, water level in reservoir falls, and animals must walk further to get water – possibly to a neighbour's farm	* Drinking water must be transported home by donkey cart * Animal must walk further to reach water, leading to miscarriages	Area of farm not usable for grazing

Where a borehole is not recharging there may be little that can be done other than to deepen it or to construct a new borehole elsewhere on the farm, assuming there is evidence of aquifer water.
The other two constraints can be addressed at a lower cost, either by repairing the water infrastructure in the case of Constraint 1, or buying an engine in the case of Constraint 2. It seems, however, that resettlement farmers often do not have enough money to pay for equipment or its repair – which, in turn, is related to the capital constraint that is discussed below.

Our findings are in line with those of a study carried out for the PTT (Kambatuku, 2004) which concluded that "Poor groundwater quality and unreliable water supply prevent the full utilisation of available farming areas". The study noted the following problems: "…inability to reticulate [water] to other parts of the farm from one source, ... the breakdown of infrastructure and lack of financial resources … Mechanical breakdown of engines and borehole installations, intermittent yields, dependence on wind, the collapse or drying up of bore holes" (PTT, 2005b). "An alarmingly high number of boreholes fall into disuse after the resettlement of beneficiaries because equipment is not regularly maintained or because it was old and obsolete to start with. The cost of regularly repairing and replacing water point equipment is prohibitive for poor farmers."

Recommendation
The GRN/MLR should consider establishing a fund to finance investments by resettlement farmers that will reduce water constraints and increase farm income, provided they are environmentally sustainable. The farmer would be expected to cover some of the costs, since he or she will benefit financially from it, and so the funds should be provided either as a soft loan or partial grant.

The above recommendation is in line with related recommendations from the PTT, namely:

- "The government, through its purchasing division, should undertake comprehensive inspection, evaluation and analysis of the water situation on the farms prior to purchasing the farms and resettling beneficiaries"

- The establishment of an Infrastructural Maintenance Grant that "would help beneficiaries to maintain the crucially important water provision infrastructure" [to] "... be spent over three years".

- "The MLR could … secure funding for the refurbishment, repair and development of infrastructure on newly acquired farms prior to resettling beneficiaries."

- "Providing each individual with a borehole would pose financial, technical and environmental problems. Instead, beneficiaries should be encouraged to cooperate and accept joint responsibility for shared resources. For example, water point committees … could be established."

7.4.5 Credit and working capital

As was discussed earlier, most beneficiaries have very limited access to credit. In addition, the PTT noted that "In terms of the lease agreements, maintenance of farm infrastructure is the MLR's obligation, but budgetary constraints have held back this process". Thus, beneficiaries are obliged either to pay for urgent maintenance and repairs from their own funds, or to allow broken equipment to remain out of action.
Beneficiaries require capital to cover maintenance and general operational costs, as well as the costs of acquiring additional livestock to build up the size of their herds. If they cannot afford to purchase additional livestock they must build up their herd size more gradually through natural reproduction. However, they often have to sell livestock to generate capital for other purposes, and so herd sizes sometimes remain fairly static over time – a kind of "capital scarcity trap".

Recommendations
We endorse the PTT's recommendations on this subject, namely:
"That lease agreements be given to beneficiaries as soon as they occupy their farms." (PTT, 2005b.)

"The MLR could introduce a loan guarantee fund for resettlement beneficiaries for the purpose of obtaining farming credit using the lease as security." (PTT, 2005a.)

The PTT also proposed a restocking grant for poorer beneficiaries "to provide for livestock acquisition over a three year period". (PTT, 2005a.)

7.4.6 Farm management and technical skills

Farm management skills

Apart from the constraints identified by respondents themselves, this appeared to be another widespread and important constraint. None of the farmers interviewed was able to provide detailed and comprehensive figures on production costs and income by enterprise, as they did not keep records of them. Two of the four respondents provided reasonably good production data, but the other two were rather vague about this.

The farmers interviewed were generally interested in improving their technical skills by attending courses or receiving "hands on" training. The NAU and NNFU have carried out a detailed assessment of the training needs of "emerging farmers", and we endorse their recommendations.

7.4.7 Bush encroachment

This was mentioned as a constraint by AALS farmers in the north, but not by beneficiaries resettled by the MLR. It is possible, however, that these beneficiaries have bush encroachment on their farms, but do not recognise the effect it has on forage availability and hence stocking rates. Bush encroachment is known to be extensive in northern Namibia, so many resettlement beneficiaries are bound to experience it.

Recommendations
De-bushing is an expensive process. If a farm is seriously encroached, the MLR should either arrange for them to be de-bushed prior to resettlement taking place (as has been recommended by the Legal Assistance Centre), or should provide beneficiaries with financial support to organise the bush clearance themselves, as recommended by the PTT. The precise respective recommendations from these two bodies were:

"Given the widespread existence of degraded pasture and farming lands in Namibia, it may be necessary for the MLR to build its own capability to restore farms before they are allocated to the resettlement process ... greater emphasis should be placed on environmental and land reform policies in order to provide for the rehabilitation of overgrazed and bush encroached land ." (Legal Assistance Centre, 2005.)

"That resettlement beneficiaries are given access to bush-clearing incentives like subsidies as proposed under the Bush Encroachment Research, Monitoring and Management report." (PTT, 2005b.)

7.5 Assessment of group schemes

7.5.1 Background

The government introduced group schemes to assist low-income beneficiaries to be resettled in groups, in order to afford them opportunity to share responsibilities in project management with the assistance of the appointed project coordinator. The group schemes are divided into two types: (a) formal or informal groups who cannot form a cooperative, and (b) cooperatives – with a minimum number of seven members – that function in accordance with the provisions of the Cooperative Act. In this summary, more emphasis is placed on the group resettlement scheme, particularly Queen Sofia.

The beneficiaries in the group resettlement scheme are mainly what MLR calls Category 1 beneficiaries, that is, people with no land, no livestock and no income. Cooperative scheme members, who have registered their corporation with the Ministry of Agriculture, Water and Forestry, are not necessarily from Category 1. The MLR has initiated more than 15 group resettlement projects including Queen Sofia, WestFallen, Bernafey, Bravo San project, Drimiopsis, Ekoka, Eendobe, Onamatadiva and Oshana-Shiva. Excelior, Mangetti Dune San, Neu Sommerau, Skoonheid, Tsintsabis, and Weste Caprivi.

These group schemes are not necessarily expected to be profitable, but are intended to provide an opportunity for the beneficiaries to understand farming in groups and to provide a stepping stone for those who do well and build up their livestock numbers and/or capital in order to be qualify for a single farm unit under the individual resettlement scheme at a later stage.

7.5.2 Queen Sofia scheme

This scheme involves six farms that were donated to the MLR. They are managed as one entity under the scheme. The farms were allocated to 50 beneficiary families, who were also given a few cattle and goats to commence farming. The project has since accommodated more settlers and their families. The Spanish Development Cooperation funded the scheme from 1999 to 2002 and spent N$14 million developing the farms, building a primary school, a clinic and beneficiaries' houses. Infrastructure was developed and maintenance carried out. An area of 8 hectares was designated for crop production, both irrigated and rain-fed. The group managed to open a bank account for the project so that revenue generated from the project could be deposited into the account. These funds are utilised to purchase seeds, fertilizers, insect pesticide (variable costs) and fuel for generators, a tractor and a truck. However, there is no financial and technical support and the previous coordinator of the project was inexperienced and untrained in agriculture-related fields.

The group was provided with a project coordinator to assist with the implementation of the project. We were told that there was a project coordinator there until November 2005, an MLR employee, who was succeeded by another person two months later. When we visited the project in October 2006, there had been no project coordinator since January 2006.

Farm enterprises and marketing

Beneficiaries had been collectively involved in producing a variety of vegetable crops (such as tomatoes, cabbage, carrots and beetroot) on the 8 hectares that had been allocated for crop production. These had been sold in substantial quantities to a company in Outjo called Erongo Food Products. Each household was also given some vegetables to market themselves. There was no crop production taking place when the consultants visited the scheme, as the engine pumping irrigation water from the main borehole had broken down four months earlier and had not been repaired. The beneficiaries were hoping that MLR would pay the repair costs.

Individual households kept livestock, but we were unable to ascertain the total livestock numbers. We were told that most of the goats that had been given to beneficiaries initially had been lost to jackals and cheetahs. The project coordinator had procured ear tags and organised the marketing of beneficiaries' animals, which were transported by truck to auctions. This organised marketing had stopped a year earlier when the project coordinator left.

We were not able to obtain financial data about specific enterprises, because the financial records were kept in the project office and the last MLR person had taken the office key with him when he left in January 2006. We sought secondary data from the MLR and the Spanish Development Cooperation, but were unable to obtain any.

Finance

The group has two bank accounts. One is for income and expenditure related to vegetable production. Erongo Food Products makes a payment into this account when it purchases vegetables from the group and the group withdraws funds from the account to cover input costs. Beneficiaries said that during the

period 2001-2003 they had about N$25 000 in the account, but since then there had only been about N$1 000 in the account. (The truck that was used to transport the vegetables has been out of action for two years, so the reduction in funds in the account may be related to that.)

The other account relates to use of the group's bakkie – each time a beneficiary uses it, they make a payment into the account.

What went wrong at Queen Sofia?
We believe that the following factors contributed to the problems with this project:

- No operational project plan.
- No constitution.
- No qualified coordinator to direct and advise the MLR on possible future intervention.
- No farm management plan, spelling out who should do what and when.
- Mismatching of different land utilisation types with different land characteristics and requirements.
- Failure to transfer responsibility for managing the farm and maintaining the infrastructure to the beneficiaries, who continued to be heavily dependent on government support (which was largely absent).
- Bush-encroachment intensity had doubled without being recognised as a serious matter which posed a threat to land productivity.
- No proper record-keeping or reporting to the ministry in relation to the progress made by the beneficiaries in order to institute necessary management systems.

7.5.3 Constraints and recommendations for group schemes

Constraints

Most of the existing group resettlement projects are fairly similar in terms of their constraints. For example, the transport and water problems mentioned earlier are common to most government resettlement schemes.

Non-functioning equipment
In the case of Queen Sofia, the truck that transported the produce to the nearest market was out of order at the time of this survey, and obviously this had a negative impact on the whole project cycle. The high-yield water borehole had not functioned for several months – this also contributed negatively to the crop production cycle of the project. Although at the time of our field visit there were no crops growing, this does not indicate that the beneficiaries did not produce crops. Given the water constraints, beneficiaries cultivate the land once a year, during rainy season. Beneficiaries were of the opinion that a properly installed irrigation system would improve the situation.

The borehole problem may not be the major problem, because the beneficiaries had reserve boreholes, although the one closest to the crop garden has poor yield aquifers. The water problem could be resolved by running pipe lines from a stronger borehole to the garden, as there are a number of boreholes evenly distributed across the farm. In any case, vegetable production is not the only enterprise, and it would be desirable to develop a plan for the diversification of enterprises.

Dependency on external support
It is striking how dependent the Queen Sofia beneficiaries still are on the MLR and others for financial support, six or seven years after the project was initiated, and four years after support from Spanish Development Cooperation finished. The National Resettlement Policy aims to "allow the beneficiaries to become self supporting" and "to make settlers self reliant", but these objectives are not being achieved. The PTT's group resettlement study found that a beneficiary household obtains an average annual income of only N$460 from livestock sales, and that 78% of all household members have no other source of income. The PTT concluded that this situation "paints a grim picture of reliance on food aid from the government".

Bush encroachment
The six consolidated farms are not fully utilised, due to the bush encroachment. This could be avoided by de-bushing, but this requires funding and the training of beneficiaries in bush-clearing techniques.

Recommendations

The MLR has capacity difficulties in implementing these group scheme projects and so outsourcing project management to NGOs and /or other organisations is necessary to implement these schemes successfully. In addition, they can only be implemented if a full group resettlement plan is in place with a clear project mandate over the time period specified by the Ministry of Lands and Resettlement.

Alternatively, an outside agricultural project coordinator should be employed by the MLR and provided with a project framework and a comprehensive set of targets to achieve over a given period. The coordinator should support the smooth implementation of the project.

A group resettlement feasibility study should be conducted to determine the viability of such a project before land allocation takes place. This should be based on a clear understanding of the objectives and their relative importance, distinguishing between subsistence farming, profit-making and facilitating the transition of Category 1 beneficiaries to a position where they have enough livestock and/or capital to be considered suitable applicants under the individual resettlement scheme.

Sustainability

Financial support should be for a set period of time, but technical support should continue indefinitely to maintain financial viability and the sustainable utilisation of land. Group beneficiary projects must be financially sound in order to cater for daily operations. Project coordinators are essential initially to ensure the development of skills and management capacity. Failure to develop beneficiaries' capacity to be self-supporting appears to be the biggest single flaw in the MLR's group schemes. Effective development of this capacity can only be facilitated effectively by development professionals with specialist expertise in capacity development of groups and individuals. The situation that we encountered at Queen Sofia, where beneficiaries had not had access to the project office and records, suggests a lack of appreciation among

relevant MLR staff of the government's objective of self-reliance and its implications for the way in which staff should relate to beneficiaries.

When groups are to be resettled, a proper project constitution, farm management plan, committee selection process and reporting objectives should be developed with beneficiaries. The continuing presence of resettled beneficiaries on the farm could be made conditional upon the achievement of jointly-agreed performance targets, provided the beneficiaries are given the necessary authority and financial and technical resources to achieve the targets.

Any such targets should be realistic. Self-reliance and financial viability cannot be realised in one or two years. The ecological condition of the farm (including the state of the soils) at the time of resettlement should be taken into account.

Queen Sofia is an example of a project that was not well planned or well managed from its inception. The MLR is aware of the group resettlement problems – they have been highlighted by a range of studies and reports. The question is how to resolve the problems with the assistance of business- and other partners.

Training and on-going support in crop production, rangeland management and drought management as well as other agriculture-related matters would help resettled beneficiaries to manage their projects productively. However, the following issues must also be taken into account:

(a) Technical support in land management, infrastructure development, different farming enterprises, bookkeeping, etc.
(b) Financial support.
(c) Outsourcing the project support to experienced consultants or agencies.
(d) Continuous monitoring and evaluation of the project.

8 ANALYSIS OF AFFIRMATIVE ACTION LOAN SCHEME

By
Czech Conroy
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8.1 Background

The Affirmative Action Loan Scheme (AALS) is an instrument of equitable land distribution for sustained economic growth. This package is tailored to the emerging commercial farmers and is an important component of the land reform programme, which enables the innovative new farmers from the previously disadvantaged communities to acquire farms on a freehold basis in the commercial area. Agribank administers the AALS on behalf of MAWF. Loans are granted against security of the mortgage bond and repayable over a period of 25 years. The applicant must own a minimum of 150 large stock units, or 800 small stock units, or be in a position to purchase the above mentioned stock. To fast-track the acquisition of farmland by the emerging farmers, the government provides support in the form of government guarantees, to enable beneficiaries to obtain larger loans to meet the rising prices of farmland than they otherwise would have secured under normal conditions (Agribank of Namibia Pamphlet).

8.1.1 Objectives of the programme

The main objectives of the AALS are to resettle well-established and strong communal farmers on commercial farmland to minimise the pressure on grazing in communal areas and to advance the ownership of freehold farmland by formerly disadvantaged Namibians. Another objective of the scheme is to accord farmers north of the VCF the opportunity to resettle on commercial farms south of the VCF. Farmers are required to dispose of their cattle through slaughtering at a registered abattoir and /or recognised abattoir entrepreneur, except for stud bulls of outstanding quality.

The AALS is one component of the GRN's resettlement programme. The government guarantees up to 35% of the loans to enable the affirmed candidates to qualify for the Agribank loans for which they have applied.

8.1.2 Guiding policies and strategies

Understanding the significance and sensitivity of the Affirmative Action Loan Scheme, the Government of Namibia through Agricultural Bank of Namibia (Agribank) promulgated the Agricultural Bank of Namibia Act, Act 5 of 2003, which enables Agribank to provide a wide range of financing products to various clients within the agricultural industry. These products focus on commercial and communal farmers, corporate loans, empowered commercial farmers and the government tractor scheme. The bank also promotes agricultural development and production in Namibia through prudent administration of loan facilities. This is to protect the financial integrity of Agribank and to ensure the continued availability of funds, thereby ensuring continued support to the farming community. Taking account of the different sub-sector conditions, the bank formulates appropriate lending strategies for its range of clients.

Since the main objective of the AALS is to resettle well-established and competent communal farmers on commercial farmland to minimise the pressure on grazing in communal areas, Agribank is using this policy to alleviate the pressure from those farmers with large numbers of livestock (at least 150 LSU/800 SSU) in communal areas.

8.1.3 Implementing agencies

8.1.3.1 Provision of financial support

Implementing agencies for AALS are line ministries such as Ministry of Lands and Resettlement and Ministry of Agriculture, Water and Forestry as well as other local commercial banks, although their interest rates are slightly higher than Agribank's subsidised interest rate.

The AALS was initiated in early 1990. In terms of the scheme, Agribank provides loans for a 25-year period at interest rates subsidised by the government. More specifically,

- The farmer must contribute 10% of the total purchase price of the farm. Thus, if the price of farm is N$1 million, the farmer must put up N$100 000.
- Years 1 to 3 are interest- and capital repayment free for full-time farmers. From Year 4, the outstanding amount is redeemable over the remaining 22 years at an escalating interest rate.
- Part-time farmers may elect to service the interest portion only for the first three years, after which the outstanding amount is redeemable over the remaining 22 years at the appropriate interest rate.

- Alternatively, part-time farmers may elect to capitalise the interest portion for the first three years, after which the outstanding amount is redeemable over the remaining 22 years at the appropriate interest rate (Agribank Annual Report, 2005).

Table 8.1: AALS repayment schedules (percentages)

	Years 1-3	Years 4-6	Years 7-8	Year 9	Year 10+
Full-time	0	2	4	8	12.13
Part-time (>N$400,000)	11.75	11.75	11.75	11.75	11.75

Sources: AgriBank (for full-time) and PTT (for part-time)

The total amounts of interest payable on different loan amounts are shown in the following table.

Table 8.2: Total interest payable on different loan amounts

	Years 1-3	Years 4-6	Years 7-8	Year 9	Year 10+
Full-time	0	2	4	8	12.13
Part-time (>N$400,000)	11.75	11.75	11.75	11.75	11.75

Sources: AgriBank (for full-time) and PTT (for part-time)

The AALS substantially affected the growth of Agribank's loans and advances over the last three years.

Agribank also offers farmers a range of other loans, including loans for:

- Crop production
- Livestock
- Infrastructure
- Consolidation of debt
- Erection of workers' houses
- Purchase of vehicles, including tractors

State guarantees were introduced to finance the difference between the purchase price of commercial farmland for agricultural and pastoral purposes and the reasonable value of that land. The latter valuation is based on what the land can produce, and is generally well below the market price. State guarantees must not exceed 35% of the purchase price of the land, which includes transfer fees and costs. The state guarantees can be extended to cover the 10% contribution towards the purchase price of land normally required from applicants if the latter find it impossible to comply with this requirement. The upshot of this scheme is that communal farmers can be assisted by up to 100% of the purchase price of land.

Soon after its appointment, the Agribank Board of Directors discovered that the government guarantee of 35% to enable AALS applicants to acquire farm land was calculated on the market price of properties – an inflated farm price. The new board consequently reviewed and amended Agribank's agricultural valuation formula of commercial farmland and has recommended a different application of the government guarantee, which should result in lowering of farm prices. The new board believes that the principles of productivity, sustainability and affordability have not been applied appropriately in loan approvals, meaning that farms acquired were over-financed and loans advanced in numerous cases exceed sustainable or affordable values.

8.1.3.2 Provision of technical support

The Ministry of Agriculture Water and Forestry and Agribank provide AALS farmers with education and training. The government also provides training and support to the farmers through Government Tractor Scheme. Since the inception of this scheme, quite a number of private entrepreneurs have successfully completed a training programme and obtained tractors.

The government offers farmers training in the following areas: estimating the carrying capacity of each camp according to the farming area in which the farm is situated, and integrated land use planning and crop farming systems. MAWF provides veterinary services, agriculture extension and training, and credit facilities. It also installs and maintains water points, supports cooperative schemes, and supports market development.

8.1.4 Institutional environment

This refers to the line ministries involved with implementing policies and providing technical support to communal farmers wanting to resettle on commercial farms. These include the Ministry of Lands and Resettlement and the Ministry of Agriculture, Water and Forestry, as well as other organisations such as NAU and NNFU.

8.1.5 Selection and characteristics of sites

The basis for selecting locations for interviewing AALS farmers was the same as that for resettled farmers under the government scheme (see earlier). Two farmers were interviewed in the Maltahöhe area and two in Otjozondjupa. An additional criterion was that one of the AALS farmers should be involved in crop production on a significant scale, so that we could obtain financial information about a wider range of enterprises and land uses. As only a minority of AALS farmers are involved in crop production in this way, it was impossible to select such a farmer randomly – instead we asked staff in Agribank's Otjiwarongo office to identify one.

One common characteristic of AALS farm in the south is Karakul production "The Karakul sheep is hardy, free ranging and environment friendly, and even during times of drought it can survive with less feeding than most small stock breeds. The multiple utilisation of Karakul products, in the form of pelts or fur, high quality meat and wool provides for it economic viability. During severe drought periods the natural born lambs are taken away from the ewes and utilised as fur so that the ewes can survive the harsh conditions. In rainy seasons the newborn lambs are raised to produce high quality meat for local consumption. The wool is hard and strong and suitable for handmade carpets." (Motinga *et al*., 2004)[12]

Karakul farming has been experiencing a slow revival since 1996 due to an increase in pelt prices.

8.1.6 Existing financial and economic data and publications

We were not aware of any major existing publications other than the PTT reports, and hence these were the only ones reviewed.

8.2 Financial analysis

8.2.1 Investment costs

The farm itself is the biggest single investment. Farm prices, and hence loan amounts, vary considerably from one region to another: currently they range from about N$100/ha in the far south to about N$450/ha in Otjozondjupa in the north.

The loan amounts and farm sizes of the four AALS farmers interviewed are given in the following table, together with the loan amount per hectare. The loan amount per hectare may have been increasing during the last few years in line with increases in farm values and will be higher for part-time farmers than full-time farmers (see section 8.2.3).

Table 8.3: Loan amounts of different AALS farmers

	Maltahohe		Otjozondjupa	
	AA1	**AA2**	**AA1**	**AA2**
Year resettled	1999	2003	2001	2002
Farm size (Ha)	10,403	10,282	6,172	2751
Loan amount (N$)	572,165	719,000	1,600,000	800,000
Loan amount/ha (N$)	55	70	259	291
Initial deposit (N$)	40,000	80,000	Not known	Not known

GR = Government Resettled farmer / group; AA = Affirmative Action Loan Scheme farmer

Although farm infrastructure should be in good condition when the farm is bought, this is not always the case. The AALS farmer may face some substantial repair costs when he or she occupies the farm or soon afterwards. Major infrastructure items include fencing, boreholes and dams.
Depending on the size of the farm, the AALS farmer may also need to acquire substantially more livestock very quickly if the farm is to be utilised to its full potential.

8.2.2 Financial viability

This section looks at the static measures of financial viability, i.e. gross margins and whole farm budgets. It also includes sensitivity analyses for major coefficients.

8.2.2.1 Gross margins

Karakul

A successful Karakul farmer needs to have access to specialist skills and a well-organised marketing system. In addition, the farmer must be able to cope with cope with a delay of two or three months between delivering the pelts to an agent (such as Agra) and the next auction, when payment for the pelts is received. The duration of this delay is determined by the time from the lambing seasons to the next pelt auction in Copenhagen (see section 8.2.4). AALS farmers are more likely to be able to meet these require-

[12] Motinga, D., Wyk, K. van., Vigne, P., Kauhika, S. and Visser, W. (2004) *National Small Stock Situation Analysis* Report prepared in draft form for MAWRD, MTI, the Meat Board of Namibia, the NAU and the NNFU.

ments than government resettled farmers, which is why Karakul production is discussed now rather than in the previous chapter of this document. One of the AALS farmers interviewed in Maltahöhe specialised in Karakul farming.

The following table contains four gross margins for Karakul. The first is based on primary data collected from an AALS farmer, using data for the previous 12 months. The second is from the Smallstock Report (Motinga et al, 2004). Last year was excellent for Karakul production in southern Namibia, with good rains and high international prices, so the AALS gross margin is the highest. This is why the AALS farmer slaughtered almost all of his lambs (and sold their pelts) rather than retaining a substantial proportion (as in the Smallstock Report gross margin).

The Smallstock Report's lambing percentage assumption is more optimistic, but the pelt price assumed (N$136) is far lower than the average price obtained by the AALS farmer (N$425 after deduction of marketing costs). The third and fourth columns assume an intermediate pelt price (N$250), which results in a gross margin between the first two figures. The last two columns represent high and medium management levels respectively, which is reflected in the different lambing percentages assumed.

Table 8.1: Karakul: gross margins based on field data in good year and Smallstock Report 2004

Parameters	**AA1-Maltahohe (Good year and high prices)**	**Smallstock Report, 2004 (Good year, low prices)**	**High Management, average year**	**Medium management, average year**
No. of breeding ewes	288	1500	1000	1000
Lambing percentage	97	120	120	100
Number of lambs born	280	1800	1200	1000
Number of lambs slaughtered for pelts*	271	1260	840	700
Number of lambs not slaughtered	13	540	360	300
Weaning percentage	*100*	*90*	*90*	*90*
No. of lambs surviving	13	486	324	270
Pelt price – Gross (N$)		136		
Pelt price – Net (after marketing costs)	425		250	250
Wool income (N$)	1800	4590	3000	3000
Meat price liveweight (N$)	300	168	200	200
Gross output/ewe	*393*	*171.44*	*277.8*	*232*
Replacement costs	??			
V. Costs – veterinary	5	6.3		
V. Costs – feedstuffs	8	7.8		
V.C – ram purchases		10.2		
Marketing (commission, levies, etc)	0	12.5		
Other (e.g. shearing wages)		22.2		
V. Costs – total	*163*	*61*	***75*	***75*
Gross margin/ewe	***229***	***110.44***	***202.8***	***157***

* Four pelts were rejected, so number sold was 267.

** The total VCs figure used in the Smallstock Report has been increased to take account of inflation since 2003.

AA = Affirmative Action Loan Scheme farmer.

Dorpers and goats

The GMs for goats and Dorpers discussed in the previous chapter are reproduced below, together with the Karakul figures from the previous table. Karakul gross margins are very similar to those for Dorpers, less than those for Boer goats at the medium and high levels, but more than for goats at the low level. However, Karakul achieve a higher net income per hectare than Dorper sheep, due to the fact that (a) only a minority of lambs are raised (most having been slaughtered at birth for their pelts) and (b) most ewes are not stressed by lactation.

Table 8.5: Small stock gross margins at different management levels

Smallstock enterprise	Management levels		
	Low	Medium	High
Boer goats	100	169	309
Dorper sheep	130	145	200
Karakul	140	157	203

Dorpers and Karakul represent alternative options for AALS farmers and with the recovery in Karakul pelt prices in recent years there has been a shift back towards Karakul production. Nevertheless, Karakul prices could decrease again, so it would be prudent to keep both of these breeds, rather than specialising solely in one or the other. Depending on the types of vegetation available, goats can complement sheep to some extent as they prefer to browse on shrubs and brushes rather than graze on grass. Nevertheless, when the level of shrubs is inadequate, or the farmer's grazing management of goats is poor, goats can be detrimental to the veld. Generally speaking, therefore, they should be seen as complementary to sheep rather than as an alternative.

Gross margins – crops (north)

Crop production is not a major enterprise for most farmers, and farmers tend to find it difficult to provide information on a per hectare basis. Information collected from the AALS farmer who was selected because he was known to be involved in crop production was sketchy, partly because the farmer was late for the interview which had to be cut short as a result. Some data were also collected from a government resettled farmer. Bearing the above in mind, information collected for a few crops is summarised in the following tables, in some cases with data from secondary sources. A farmer can produce irrigated crops twice a year. The figures presented below for individual farmers are for one crop. It is unclear whether Etunda figures are for one or two crops p.a. The detailed calculations are attached in Annexure 8 on the CD. The table below summarises the results.

Table 8.62: Gross margins – crops (north)

Water Melons

	GR2 –Martha		Etunda-Large-scale	
	Total	Per hect.	Total	Per hect.
Gross output	*1250*			*60000*
V. Costs – total				*14847*

Gross margin/ha(N$)				45153

Tomatoes

	AA2		Etunda		MAWRD/NDC/DECOSA	
	Amount	Per hect.	Amount	Per hect.	Amount	Per hect.
Gross output		40000		90000		60000
V. Costs – total		6584		13950		26355.5
Gross margin/ha(N$)		33416		76050		33644.5

Onions

	AA2***		Etunda		MAWRD/NDC/DECOSA	
	Total	Per hect.	Total	Per hect.		Per hect.
Gross output	18000	36000		54000		60000
V. Costs – total		13584		15640		9077
Gross margin/ha(N$)		20816		38360		43423

Maize -Rainfed

	AA2		MAWRD/NDC		
	Amount	Per hect.	Amount	Per hect.	
Gross output		4000		1260	
V. Costs – total		?		1104	
Gross margin/ha(N$)		?		156	

GR = Government Resettled farmer / group; AA = Affirmative Action Loan Scheme farmer

8.2.2.2 Farm budgets

The following table shows farm budgets estimated for three of the AALS farmers interviewed. (The interview with the fourth farmer was too short to obtain the data required to work out his farm budget.) The calculations are based on income (production and output price) data for 2005/06. The depreciation and interest figures are averages over the lifetimes of the fixed assets and loan respectively. On the basis of these figures, two of these farmers are making a profit from farming and one is making a loss.

Table 8.73: Farm budgets for AALS farmers Interviewed, based on production and income data for 2005/06 (N$)

	AA1-Maltahohe	AA2-Maltahohe	AA1- Otjozondjupa
Total gross margin	**193,065**	**78,100**	**340,464**
- Depreciation of fixed assets (30 years)	75,924	128,257	69,147
- Maintenance of fixed assets	15,511	17,000	21,280
- Fuel for car, pumping etc	20,108	8400	14,943
= Value added	**81,522**	**-45,557**	**235,094**
- Wages (not included in GMs)	26,520	14,000	64,680
= Net Farm Income	**55,002**	**-89,557**	**170,414**
- Interest paid	28,600	35,950	80,000
= Profit of Farming	**26,402**	**-125,507**	**90,414**

AA = Affirmative Action Loan Scheme farmer.

The main reason why one farmer (AA2-Maltahöhe) is making a loss is that his gross margin is well below what it should be for a farm of that size (very similar in size to that of AA1-Maltahöhe). This is largely due to his small herd size, as can be seen from the following two tables. The first table shows the farm

sizes and current or recent herd sizes of the AALS farmers; the second table converts these numbers into total herd weight and compares these with the potential herd weights, based on the estimated carrying capacity of the farm.

Table 8.8: AALS farmers' herd sizes (recent/current) and farm sizes

Farmer	Farm size	Smallstock		Cattle	
	ha	Adult	Total	Adult	Total
Maltahohe AA1	10,403	464	734	90	160
Maltahohe AA2	10,282	300	650	0	0
Otjozondjupa AA1	6,172	300	400	272	375
Otjozondjupa AA2	2,751	128	150	100?	?

As can be seen from the following table, three of the farmers are close to utilising their farms to their full capacity – their actual herd weights are close to the maximum potential weights. The farmer with the small herd was aware that his farm could support a much larger herd. There was a drought in 2003, the year that he took occupation of the farm. He lost about 300 small ruminants to the drought (roughly half sheep and half goats).

Table 8.9: Farm utilisation of AALS farmers

Farmer	Smallstock (Kg)		Cattle (Kg)		Total weight of herd (kg)	Potential herd weight *** (kg)	Utilisation (percent)
	Adult	Total	Adult	Total			
Maltahohe AA1	27,840	40,318	32,400	48,400	88718	93627	95
Maltahohe AA2	18,000	23,950	0	0	23950	92,538	26
Otjozondjupa AA1	18,000	19,700	97,920	10,300	108,220	123440	88
Otjozondjupa AA2	7,680	8,054	36,000?	6000?	50,000	55020	91

*Assumes weight of 60 kg for adult small stock, and 17 kg for young ones.
**Assumes weight of 360 kg for adult large stock, and 100 kg for young ones.
*** Assuming carrying capacity of 9 kg/ha (6 ha/SSU) in Maltahöhe, and 20 kg/ha in Otjozondjupa.

Sensitivity analysis – small stock farm in the south (Maltahöhe)

Farm budgets have been calculated for a 10 000 ha farm with a carrying capacity of 9 kg/ha (hence maximum herd weight of 90 000 kg), at both low and high levels of farm capacity utilisation, that is about 50% and 80% respectively. The assumption of 80% in the high capacity scenario provides for a necessary "safety margin" in case of drought. It is a mixed enterprise farm with Boer goats, Dorpers and Karakul. The total herd/flock weight for each type of animal is assumed to be the same, and the numbers of each type in each scenario are shown in the following table. The assumptions about weights of adults and young are the same as those given as a footnote to the previous table. A small stock unit is an adult and offspring combined, that is 77 kg. However, in the case of Karakul it is assumed that 70% are slaughtered at birth for their pelts, making the average unit weight 65 kg.

Table 8.10: Numbers of goats, Dorpers and Karakul in each capacity utilisation scenario

Capacity utilisation Level	Goats		Dorper		Karakul units	
	Units	Total herd weight	Units	Total herd weight	Units	Total herd weight
Low (50%)	194	15,000	194	15,000	230	15,000

High (80%)	311	24,000	311	24,000	369	24,000

For each utilisation scenario, gross margins have been calculated for three different management levels using the figures given earlier in the chapter. The assumptions about fixed costs are the same for both scenarios and for all three management levels, and are shown in the following table. It has been assumed that annual maintenance of fixed assets is equivalent to 10% of the initial capital cost of the asset. This is rather low – some people assume 20 to 25% – and reflects the low actual maintenance and repair costs reported by AALS farmers. It has also been assumed, in calculating the annual depreciation costs of the fixed assets, that their lifespan is 30 years.

Table 8.4: Costs related to fixed assets for 10 000 ha small stock farm

Fixed asset	Maintenance - @10% of purchase cost (N$)	Number of units (km is unit for fencing)	Unit cost (N$)	Purchase cost (N$)
Boundary fencing	18,450	41	*9,000	**184,500
Camps fencing	9,000	***20	4,500	90,000
Boreholes	37,500	5	75,000	375,000
Bakkie	4,000	1	40,000	40,000
Pump & engine	3,200	2	16,000	32,000
Dams, pipes & troughs	16,000	5	32,000	160,000
Total	88,150			881,500

* Assumes the boundary fencing is jackal-proof and hence more costly than internal camp fencing.

** Assumes that the farm borders other farm(s) and that the costs of the boundary fencing are shared equally between the farms.

*** Assumes there are four camps on the farm.

The sum (N$137 533) of the total annual fixed cost maintenance cost, the annual fixed cost depreciation cost and the annual fuel costs (see following table), is subtracted from the gross margins to arrive at the "Value Added" figure.

Table 8.5: Fixed costs assumed in determining value added

ITEM	**N$**
Depreciation of fixed assets (30 years)	29,333
Maintenance of fixed assets	88,150
Fuel for car, pumping etc	20,000
Total	**137,533**

As can be seen from the following table, value added is positive in three cases but net farm income and profit are only positive when there is there is a high level of management and a high capacity utilisation factor.

Table 8.6: Farm budgets for 10 000 ha small stock farm supporting 9 kg/ha

	Low capacity utilisation			**High capacity utilisation**		
	Low	**Medium**	**High**	**Low**	**Medium**	**High**
Total gross margin	**76,820**	**97,026**	**145,436**	**123,190**	**155,587**	**233,206**
Value added	**-60,713**	**-40,507**	**7,903**	**-14,343**	**18,054**	**95,673**
- Wages	21,000	21,000	21,000	21,000	21,000	21,000
= Net Farm Income	**-81,713**	**-61,507**	**-13,097**	**-35,343**	**-2,946**	**74,673**
- Interest paid	36,000	36,000	36,000	36,000	36,000	36,000

= Profit of Farming	**-117,713**	**-97,507**	**-49,097**	**-71,343**	**-38,946**	**38,673**

Sensitivity analysis – mixed livestock farm in north (Otjozondjupa)

Farm budgets have been calculated for a 3 000 ha farm with a carrying capacity of 20 kg/ha (hence maximum herd weight of 60 000 kg), at both low and high levels of farm capacity utilisation, that is about 60% and 90% respectively. It is a mixed enterprise farm with cattle and Boer goats (goats have been included because they were the main type of small stock found on AALS farms in the north). One cattle unit is a cow and calf combined (460 kg) while a goat unit is an adult and kid combined (77 kg). The numbers of goats and cattle are assumed to be the same, based on the ratios of small stock to large stock observed when visiting AALS farmers.

Table 8.7: Numbers of goats and cattle in each capacity utilisation scenario

Capacity utilisation Level	Goats		Cattle		Combined herd weight (approx)
	Units	Herd weight	Units	Herd weight	
Low (60%)	67	5159	67	30,820	36,000
High (90%)	100	7700	100	46,000	54,000

For each utilisation scenario, gross margins have been calculated for three different management levels using the figures given earlier in the chapter. The assumptions about fixed costs are the same for both scenarios and for all three management levels, and are shown in the following table.

Table 8.8: Costs related to fixed assets for 3 000 ha mixed livestock farm

Fixed asset	Maintenance - @10% of purchase cost (N$)	Number of units (km is unit for fencing)	Unit cost (N$)	Purchase cost (N$)
Boundary fencing	9,900	22	*9,000	**99,000
Camps fencing	4,950	***11	4,500	49,500
Boreholes	22,500	3	75,000	225,000
Bakkie	4,000	1	40,000	40,000
Pump & engine	4,800	3	16,000	48,000
Dams, pipes & troughs	9,600	3	32,000	96,000
Total	55,750			557,500

* Assumes the boundary fencing is jackal-proof, and hence more costly than internal camp fencing.

** Assumes that the farm borders other farm(s) and that the costs of the boundary fencing are equally shared between the farms.

*** Assumes there are four camps on the farm.

The sum (N$94 333) of the total annual fixed cost maintenance cost, the annual fixed cost depreciation cost and the annual fuel costs (see following table), is subtracted from the gross margins to arrive at the "Value Added" figure.

Table 8.9: Fixed costs assumed in determining value added

ITEM	N$
Depreciation of fixed assets (30 years)	18,583
Maintenance of fixed assets	55,750
Fuel for car, pumping etc	20,000
Total	**94,333**

The value added is positive in all three cases under the high capacity utilisation scenario, as well as in the high management case under the low utilisation scenario. However, the net farm income (after wages have been subtracted) is only positive in the medium and high cases with high capacity utilisation. A profit is made only in the high management and high utilisation case. This again highlights the importance of performing well against both of these parameters.

Table 8.10: Farm budgets for 3 000 ha cattle and goat farm supporting 20 kg/ha

	Low capacity utilisation			High capacity utilisation		
	Low	**Medium**	**High**	**Low**	**Medium**	**High**
Total gross margin	**74169**	**88976**	**122543**	**110,700**	**132,800**	**182,900**
Value added	**-20,164**	**-5,357**	**28,210**	**16,367**	**38,467**	**88,567**
- Wages	21,000	21,000	21,000	21,000	21,000	21,000
= Net Farm Income	**-41,164**	**-26,357**	**7,210**	**-4,633**	**17,467**	**67,567**
- Interest paid	40,000	40,000	40,000	40,000	40,000	40,000
= Profit of Farming	**-81,164**	**-66,357**	**32,790**	**-44,633**	**-22,533**	**27,567**

Sensitivity analysis – cattle farm in north (Otjozondjupa)

Farm budgets have been calculated for a 3 000 ha farm with a carrying capacity of 20 kg/ha (hence maximum herd weight of 60 000 kg), at both low and high levels of farm capacity utilisation, that is about 60% and 90% respectively. The only farm enterprise is cattle production. A cattle unit is a cow and calf combined (460 kg).

Table 8.11: Numbers of cattle in each capacity utilisation scenario

Capacity utilisation Level	**Number of cattle units**	**Combined herd weight (approx)**
Low (60%)	78	36,000
High (90%)	117	54,000

For each utilisation scenario, gross margins have been calculated for three different management levels using the figures given earlier in the chapter. The assumptions about fixed costs are the same for both scenarios and for all three management levels, and are as the same as for the previous (mixed livestock) case.

The value added is positive in all three cases under the high capacity utilisation scenario. However, the net farm income (after wages have been subtracted) is only positive in the medium and high cases with high capacity utilisation. No profit is made in any of the cases.

Table 8.12: Farm budgets for 3 000 ha cattle farm supporting 20 kg/ha

	Low capacity utilisation			High capacity utilisation		
	Low	**Medium**	**High**	**Low**	**Medium**	**High**
Gross margin	**70,278**	**82,290**	**93,210**	**105,417**	**123,435**	**139,815**
Value added	**-24,055**	**-12,043**	**-1,123**	**11,084**	**29,102**	**45,482**
- Wages	21,000	21,000	21,000	21,000	21,000	21,000
= Net Farm Income	**-45055**	**-33043**	**-22,123**	**-9,916**	**8,102**	**24,482**
- Interest paid	40,000	40,000	40,000	40,000	40,000	40,000
= Profit of Farming	**-85,055**	**-73,043**	**-62,123**	**-49,916**	**-31,898**	**-15,518**

8.2.3 Financing

An Affirmative Action Loan Scheme was implemented in early 1990. In terms of the scheme, Agribank provides loans for a 25-year period at interest rates subsidised by the government. More specifically,

- The farmer must contribute 10% of the total purchase price of the farm. Thus, if the price of farm is N$1 million, the farmer must put up N$100 000.
- Years 1 to 3 are interest- and capital repayment free for full-time farmers. From Year 4, the outstanding amount is redeemable over the remaining 22 years at an escalating interest rate.
- Part-time farmers may elect to service the interest portion only for the first three years, after which the outstanding amount is redeemable over the remaining 22 years at the appropriate interest rate.
- Alternatively, part-time farmers may elect to capitalise the interest portion for the first three years, after which the outstanding amount is redeemable over the remaining 22 years at the appropriate interest rate (Agribank Annual Report, 2005).

Table 8.13: Affirmative Action Loan repayment schedules (%)

	Years 1-3	Years 4-6	Years 7-8	Year 9	Year 10+
Full-time	0	2	4	8	12.13
Part-time (>N$400,000)	11.75	11.75	11.75	11.75	11.75

Sources: AgriBank (for full-time) and PTT (for part-time)

The total amounts of interest payable on different loan amounts are shown in the following table.

Table 8.14: Total amounts of interest payable on loans of different sizes

Loan size (N$)	1 500 000	1 800 000	2 000 000
Total interest payable	1 861 495	2 123 111	2 543 235

The AALS substantially affected the growth of Agribank's loans and advances over the last three years.

Agribank also offers farmers a range of other loans, including ones for:

- crop production
- livestock loans
- infrastructure
- consolidation of debts
- erection of workers' houses
- purchase of vehicle/tractor

State guarantees were introduced to finance the difference between the purchase price of commercial farmland and the reasonable value of that land for agricultural and pastoral purposes. The latter valuation is based on what the land can produce, and is generally well below the market price. State guarantees must not exceed 35% of the purchase price of the land, which includes transfer fees and costs. The state guarantees can be extended to cover the 10% contribution towards the purchase price of land anomaly required from applicants if the latter finds it impossible to comply with this requirement. The upshot of this scheme is that communal farmers can be assisted by up to 100% of the purchase price of land.

Soon after its appointment, the Board of Directors discovered that the government guarantee of 35% to enable AALS to acquire farm land was calculated on the market price of properties' inflated farm prices. The new Board appointed has consequently reviewed and amended Agribank's agricultural valuation formula of commercial farmland and has recommended a different application of the government guarantee, which should result in lowering of farm prices. The new board believes that the principles of productivity, sustainability and affordability have not been applied appropriately in loan approvals, meaning that farms acquired were over-financed and loans advanced in numerous cases exceed sustainable or affordable values.

The 35% loan guarantee has recently been revised, and the new approach to the state guarantee is slightly different from the past. In future, Agribank will finance 80% of the land loan value and the remaining 20% will be divided into two equal parts. The government will provide 10% as the state guarantee and the other 10% is the owner's contribution towards the total loan value. The 10% provided by the government will not affect the purchase value – for example, if the loan is N$1.5 million, the owner's contribution will be 10% of this.

8.2.4 Marketing

Karakul

The skins of natural born Karakul lambs are dried on the farms and sent to the pelt-sorting centre in Windhoek, where Agra grades them for auction sales. They are called Swakara pelts. During the grading process, care is taken by experts to ensure that all non-export quality pelts are withdrawn. Pelts are then exported to Copenhagen Fur Centre in Denmark, where they are offered on auction twice a year, in April and September. Producer prices are heavily influenced by the N$/Danish Kröner exchange rate. Karakul meat is marketed locally, for the most part.

One of the AALS farmers in Hardap was involved in Karakul production. He sold 140 pelts in September 2005 (out of 144 produced) and about 123 in April 2006, via Agra's Maltahöhe branch, at prices of N$460 and N$385 respectively.

Dorpers and goats

AALS farmers generally sell their small stock at auctions held primarily by Agra and Namibia Livestock Auctioneers.

8.3 Economic analysis

8.3.1Costs and benefits

The economic analysis uses the same conversion factors for costs and income/benefits as have been used in the other chapters, regarding VAT, a Forex premium for internationally traded items, and labour.

8.3.2 Economic viability

8.3.2.1 Gross margins

The following tables give the equivalent economic gross margins for Boer goats, Dorpers and Karakul to those that were presented in the financial section.

Table 8.15: Small stock gross margins in the south (Maltahöhe)

	Low			Medium			High		
	Boer	Dorper	Karakul	Boer	Dorper	Karakul	Boer	Dorper	Karakul
Gross output	108.8	129.2	178.6	182.1	165.8	197.3	335.2	223.2	236.2
Variable costs	23.8	18.7	28.7	43.4	41.4	31.6	70.0	49.3	31.6
Gross margin	85.0	110.5	149.9	138.8	124.4	165.6	265.2	173.9	204.6

The following table gives the equivalent economic gross margins for cattle to those that were presented in the financial section.

Table 8.16: Cattle gross margins in the north (Otjozondjupa)

	Low	Medium	High
Gross output	1083.2	1152.1	1342.6
Veterinary costs	125.0	93.5	127.5
Feedstuffs	176.9	131.8	182.8
Transport	14.5	12.0	15.3
Gross margin	766.9	914.7	1017.0

8.3.2.2 Farm budgets

Economic analysis has been done for the small stock and cattle cases discussed in the previous section. The following table summarises the results for the small stock case.

Table 8.17: Farm budgets for 10 000 ha small stock farm supporting 9 kg/ha

	Low capacity utilisation			High capacity utilisation		
	Low	**Medium**	**High**	**Low**	**Medium**	**High**
Gross margin	**72408.9**	**89135**	**132202**	**111324**	**137774**	**205581**
Value added	**6470.2**	**23197**	**66264**	**45386**	**71836**	**139643**
- Wages	840.0	840.0	840.0	840.0	840.0	840.0
= Net Farm Income (& Return to capital)	**5630.0**	**22357**	**65424**	**44546**	**70996**	**138803**
ERR (%)	**1.28**	**7.9**	**14.84**	**10.11**	**16.11**	**31.49**

The following table summarises the results for the same “cattle only” case that was discussed in the financial section. In all cases, the return to capital and the economic rates of return (ERRs) are positive, the latter ranging from 3.8% to 25%. This does not, of course, include the effect of loan repayment.

Table 8.18: Farm budgets for 3 000 ha cattle farm supporting 20 kg/ha

	Low capacity utilisation			High capacity utilisation		
	Low	**Medium**	**High**	**Low**	**Medium**	**High**
Gross margin	**59821.7**	**71,350**	**79,323.7**	**89,732.5**	**107,025.6**	**118,985.6**
Value added	**11,340**	**22,869**	**30,842**	**41,251**	**58,544**	**70,504**
- Wages	840	840	840	840	840	840
= Net Farm Income (& Return to capital)	**10,500**	**22,029**	**30,002**	**41,411**	**57,704**	**69,664**
ERR (%)	**3.8**	**7.9**	**10.7**	**14.5**	**20.7**	**25.0**

8.3.3 Socio-economic impact and external effects

Three of the four farmers interviewed had high capacity utilisation factors, and their production levels may be comparable with those of many commercial farmers operating under comparable farm sizes and agro-ecological conditions. All of them are producing livestock and/or livestock products (Karakul pelts) for export – to Angola, South Africa and Europe. Nevertheless, the one farmer who had begun to repay his AALS loan was struggling financially (see next section), as was the farmer with the low utilisation factor. The financial analysis presented earlier and empirical evidence suggest that many AALS farmers find it difficult to repay their loans. Some of them could find themselves subsidising their agricultural business with funds from business in other sectors.

8.4 Constraints and recommendations

8.4.1 Overview

The following table summarises the constraints that were identified by the four AALS farmers whom we interviewed.

Table 8.19: Main constraints identified by AA respondents

Constraint	Maltahöhe: Small stock		Otjozondjupa: Cattle	
	AA1	AA2	AA1	AA2
Production				
Difficulty in accessing credit for infrastructure/major fixed costs (e.g. tractor, irrigation system)	√			√
Insufficient working capital/lack of credit	*	√		
Difficulty in loan repayment	√	Not** applicable		Not** applicable
Drought	√	√		
Bush encroachment			√	√
Farm labourers: quality & productivity	√	√		
Fuel costs	√			
Infrastructure not in good working order when farm was occupied			√	
Marketing				
Low prices for livestock/crops		√-sometimes	√- fluctuating	
Distance to market	√			

* This farmer sold goats to generate working capital.

** These farmers had only occupied their farms in 2003 & 2002 and had not yet started repaying their loans.

AA = Affirmative Action Loan Scheme farmer.

8.4.2 Income sources and loan repayment

Income sources

Three of the AALS farmers interviewed had other businesses, as indicated in the table below. The fourth farmer (Number 1 in the south) was a pensioner, and although he did not have another business himself, his son was in the process of setting up a real estate business in Windhoek. Three of them said that their farms were their main source of income, but it was clear that the other businesses facilitated access to capital, either directly or indirectly (by making them more creditworthy). The farmer who did not have a business said that he sold his goats to provide capital to cover operational costs, such as paying his farm labourers.

Table 8.20: Farmers' sources of income (ranked by farmers)

	Maltahohe		Otjozondjupa	
Sources of income	**1**	**2**	**1**	**2**
Farm enterprises	1	2	1	1
Pensions	2			
Other businesses		1*	2**	2
Remittances	3			

* shop ** petrol filling station and shop

Loan repayment

One of the AALS farmers interviewed in the south, who has a farm of 10 403 ha, was of the opinion that Agribank's minimum livestock requirement of 800 small stock and 150 large stock is not enough to enable a farm to be viable. Furthermore, he had made a deposit of N$40 000 for his farm, which had forced him to sell some of his original animals, and the remaining number was not enough. He said he has fewer animals now than he had when he acquired the farm in 1999, partly for the above mentioned reason and partly due to drought. He made a loss from 1999 to 2004, and 2005-6 was the first year in which he had made a profit. He has major doubts about the profitability of commercial small stock farming in the south, and believes that to be a successful full-time farmer you require more animals than your farm can actually support.

The difficulties experienced by the above mentioned AALS farmer appear to be typical of many, as indicated by the following extract from a report published a year ago:

"In recent years a number of farmers have reported, as Agribank confirms, that they are unable to meet the repayment conditions. In the period March to September 2004 the amount in arrears doubled, and in March 2004 Agribank reported that 199 out of 544 or 37% of the AALS loan accounts were in arrears." (Legal Assistance Centre, 2005.)

We were informed by a person with access to up-to-date information that nearly 50% of the AALS farmers are likely to default on their loans to Agribank. Some of the Affirmative Action farms are being auctioned.

As discussed previously in this report, one of the reasons for this situation is over-inflated farm prices. In most instances, the farm offer price is higher than Agribank's estimated value of the property, which is based on its production potential. Secondly, commercial farmers tend to demand a price well above the production-based value because they need to provide a retirement income for themselves and cover the cost of buying a new house. Thirdly, the availability of AALS loans has increased the demand for farms and inflated purchase prices.

There are also other reasons for loan repayment difficulties. First, due to the stipulation of minimum farm sizes, based on the Subdivision of Agriculture Land Act, Act 70 of 1970, an AALS farmer may be required to buy a farm that can support 400 LSU, with an AALS loan that assumes he or she has 400 LSU, when in fact the farmer may only have 150 LSU to begin with. With these starting conditions it becomes very difficult to pay back the loan. Secondly, we were informed that until recently, Agribank has been basing its loan size on the farm value *plus* the government's 35% guarantee. Thus a loan could have been for about N$2 million instead of N$1.5 million, thereby requiring the farmer to pay far more interest on the loan than would otherwise have been the case.

Most commercial farmers do not have loans to repay and so their financial position differs from AALS farmers. It may well be that it is not possible under current conditions to operate a farm profitably when it is financed entirely through AALS loans, due to the interest and capital repayments involved. Those AALS farmers who do not default on their Agribank loans may survive due to their ability to subsidise their farms with funds from their other businesses. It would appear that a radical review of the AALS is required.

Recommendation

The government should undertake a major review of the AALS and consider a wide range of options. These could include:

- Regulating farm prices to minimise or eliminate the gap between market prices and production-based farm values.
- Re-examining the current requirement for the owner to contribute 10% to the total property value.
- The option of two or more people buying a farm together, with each buyer supplying his or her proportionate share of the livestock.
- Allowing the commercial farmer who is selling the farm to continue to live there (and any associated complications such as ownership issues, rental fees, and divided loyalty of farm labourers).

In addition, we recommend that:

- The government should liaise with Agribank when issuing exemption certificates because the deed of sale and the exemption waiver certificate may reflect the asking price rather than the value of the property.
- The land should be valued by the banks concerned and/or the government before the exemption waiver certificate is issued so that the AA farmer purchases the farm at a price within the market value of the property.

8.4.3 Bush encroachment

According to a recent publication:
"Large areas of central and eastern Namibia are now covered with bush that is so abnormally dense that access to grass and stocking capacity is greatly reduced...the highest bush densities in Namibia [are] found on freehold farms in northern Otjozondjupa where rainfall is higher than in the south. An association between heavy grazing pressure, cattle ranching and bush encroachment seems obvious, since bush is much thicker on the freehold farms of this farming system than in any others. Pastures that are badly encroached have lost several times their previous productivity because of reduced grass biomass and cattle being unable to reach grass beneath and between impenetrable bush." (Mendelsohn, 2006.)

Both of the AALS farmers in the north identified bush encroachment as a constraint. Many commercial farmers have not been rigorously de-bushing their land, and hence the carrying capacity has declined: this could in some cases be a contributory factor to their decision to sell the farm.

De-bushing is an expensive process, and may be difficult to justify financially unless the wood can be sold as charcoal. One of the AALS farmers had a friend working with him to de-bush parts of the farm and sell wood and charcoal. We interviewed the friend, who said there were no markets for charcoal in the north, but that he intended to transport charcoal to Swakopmund and Walvis Bay where he had identified a market. He was also looking to export to European markets.

Recommendations

We endorse the PTT's recommendations regarding dealing with bush encroachment, namely:

- That bush clearing incentives be used to encourage landowners to part with some of their land, in return for higher subsidies.
- That resettlement beneficiaries be given access to bush-clearing incentives like subsidies, as proposed under the Bush Encroachment Research, Monitoring and Management report.

8.4.4 Farm labourers

Both farmers in the south identified farm labourers as a major constraint. One farmer, who has three labourers, said that although they are well trained, they do not work hard and are not productive or loyal. He said this was related to the Labour Act, which guarantees minimum wages and associated benefits, and that the labourers just want to claim the money. (The other said that he had had a good labourer until recently, when the employee had left without giving any explanation.) His son added that he does not think labourers know how to work for a black farmer – they have attitude problems (and an alcohol problem) and abuse their position. He said that he and his father had inherited farm labourers from the previous (white) owner, and had doubled their salary, but still had serious problems with them.

There is no obvious reason why this problem exists in the south, but not in the north, unless there is a significant difference in the labour markets between north and south. It may be that the difference is simply due to chance. Neither of the farmers experiencing the constraint was able to identify any sound way to resolve the situation.

9 ANALYSIS OF COMMERCIAL FARMING SYSTEMS

By
Czech Conroy
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9.1 Description of commercial farming systems

Namibia has three broad categories of land tenure. Approximately 44% of the country is so-called "commercial" farmland with freehold tenure, 41% is allocated to communal areas, and the remaining 15% is state land, including conservation areas. The communal areas are situated mainly in contiguous blocks in the north of the country, while the commercial (freehold) areas occupy most of the centre and the south of the country.

Commercial farms are only located south of the Veterinary Cordon Fence. The commercial farming sector is well developed, capital-intensive and export-oriented. Commercial livestock production accounts for 69% of national agricultural output and comes from 52% of the farming/grazing land. The freehold area is divided into 6 337 farms, with an average size of 5 700 ha, owned by about 4 200 individuals or agricultural enterprises. Commercial farms have primarily commercial objectives. Each ranch is subdivided into a number of paddocks, and some form of rotational grazing is usually practised.

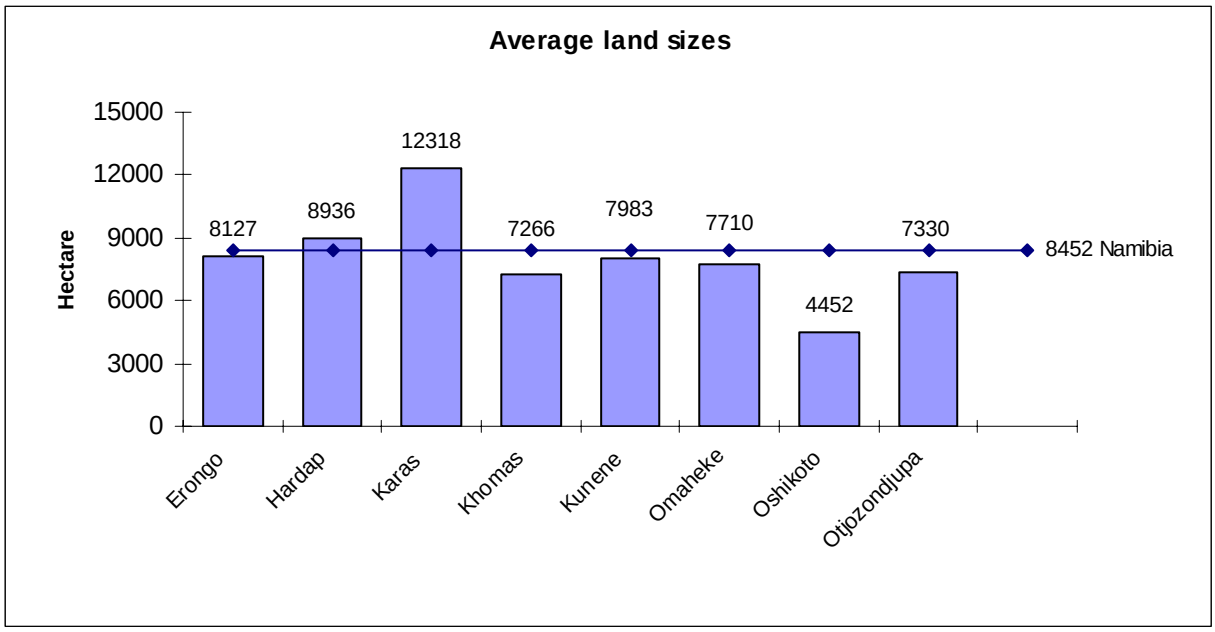
Cattle are the largest contributor to commercial farming income, and the major breeds are Brahman, Afrikaner and Simmentaler. Sheep are largely concentrated in the drier south and are mostly Karakul, bred mainly for their pelts, and Dorpers, bred for meat production. Goats are more widely distributed and the main breeds are the Boer goat and the Angora goat. Grazing livestock are raised under extensive ranching

conditions, relying on natural pasture occasionally supplemented by protein/mineral licks. Ostriches are farmed in the drier parts of the country and also utilise natural vegetation, supplemented by fodders and concentrates.

Commercial farmlands are very important in the country since they contribute to the conservation of soil, water and abiotic diversity. They generate foreign exchange and contribute to self-sufficiency of the country. Individual ownership of land facilitates the closed grazing systems used by commercial farmers, which are ecologically desirable under Namibia's climatic conditions.

Commercial farms are generally the largest in the country, which puts their owners in a relatively advantageous position. The figure below sets out the average farm sizes of a sample of NAU members in the various regions. It should be noted that these farming operations represent farming activities on the farmer's own ground as well as leased property. The average farm size of participants is 8 452 hectares. The median is, however only 6 957 hectares. Farm sizes of the participants in this survey varied from 25 ha to 50 000 ha.

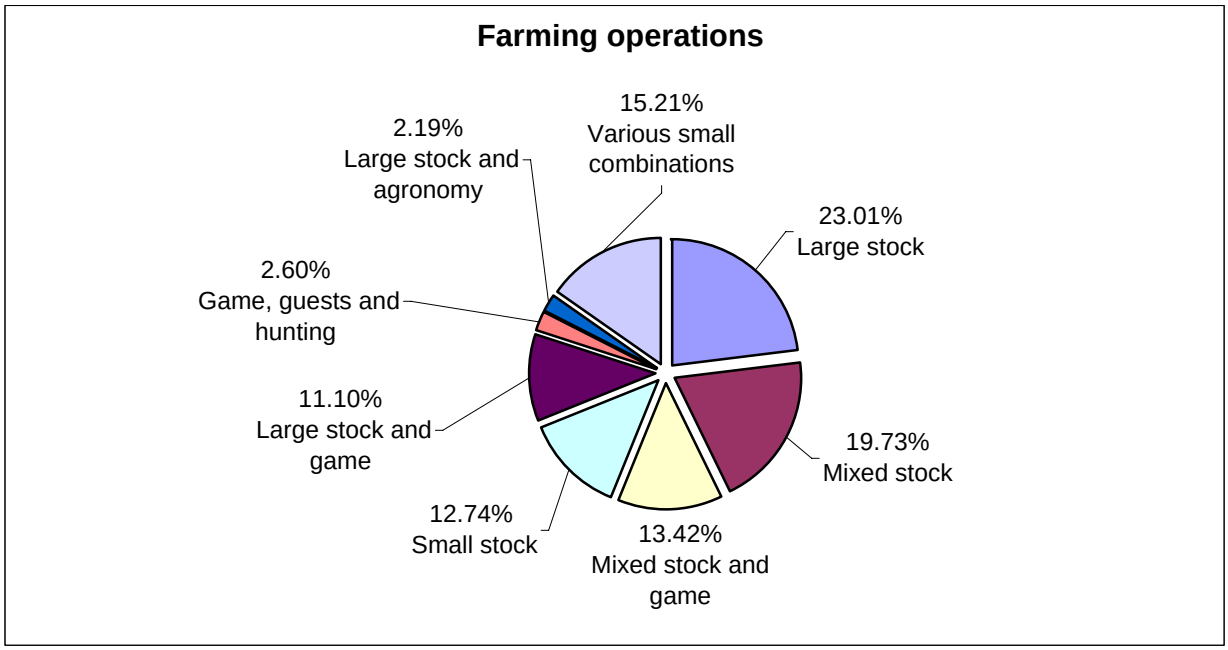
Figure 9.1: Average sizes of commercial farms in different regions



Source: Agricultural Employers Association, 2004.

The various types of commercial farming operation are summarised in the following pie chart.

Figure 9.2: Farming operations of commercial farmers



Source: Agricultural Employers Association, 2004.

9.2 Financial analysis

Information in the public domain about the financial viability of commercial farms, particularly fixed costs and farm budgets, is surprisingly limited. Some gross margins for commercial farms are given below, taken from the GFA terra report (2002).

Table 9.1: Gross margin calculation for beef production, 2000 to 2002*

	Study Group				
	1	**2**	**3**	**4**	**5**
Stocking (kg/ha)	19.60	25.50	29.50	27.70	26.90
Production (kg/ha)	6.90	9.50	12.90	9.70	8.90
Gross income (N$/ha)	41.91	58.98	70.86	51.51	42.12
Running costs (% of gross income)	64.00	51.00	34.00	58.00	54.00
Net income (N$/ha)	**19.28**	**28.90**	**46.77**	**21.63**	**19.38**

*The figures from study groups 1, 2 and 3 were derived from the financial year March 2001 to February 2002. Those from study groups 4 and 5 are for the period September 2000 to August 2001.

Table 9.2: Gross margin calculation for beef production (Karstfeld)

	1998	**1999**	**2000**	**2001**	**2002**
Production (kg/ha)	9.00	8.80	8.00	9.70	10.20
Gross income (N$/ha)	38.94	47.03	44.50	51.51	86.40
Running costs (% of gross income)	59.09	52.94	63.80	58.00	31.94

Net income (N$/ha)	**15.93**	**22.13**	**16.11**	**21.63**	**58.80**

Table 9.3: Gross margin calculation for small stock farming*

Type of Farming	**Lamb**	**Lamb**	**Lamb**	**Goat**
District	Aranos	Aroab	Karasburg	Keetmanshoop
Farm size (ha)	6,000	10,000	10,000	6,000
Stocking rate (N$/ha)	17.3	13.0	17.0	10.2
Production (kg/ha)	8.2	6.1	7.4	5.0
Gross income (N$/ha)	68.75	50.16	66.05	36.38
Net income (N$/ha)	**31.33**	**27.84**	**39.24**	**3.76**

* This table is from the GFA terra systems report – the year to which the data pertained was not provided.

10 COMPARATIVE ANALYSIS AND CONCLUSIONS

10.1 Compatibility of the different land use systems

Planning for land use systems is carried out by different ministries and to some extent, different land use systems may even compete for public funding. On the other hand, different land use systems may also be complementary, like communal conservancies and community forests, which are based on the same principles, and complement one another with regard to the utilisation of a community's natural resource potential. It is difficult, if not impossible, to compare the different land use systems, however, this attempt should lead to fruitful discussions and effective decision-making, then the aim of this chapter is fulfilled.

The table below attempts to compare the compatibility of different land use systems.

Table 10.1: Compatibility of the different land use systems

	Communal Areas			GS	Commercial Areas			
	SSCFU	CF	CC	GS	IRS	GRS	AALS	Com-F
Small-Scale Commercial Farming Units (SSCFU)		-	-	-	n/a	n/a	n/a	n/a
Communal Forests (CF)			+	-	-	+	n/a	n/a
Communal Conservancies (CC)				-	-	+	n/a	n/a
Green Scheme (GS)					-	+	n/a	n/a
Individual Resettlement Schemes (IRS)						-	-	-
Group Resettlement Schemes (GRS)							-	-
Affirmative Action Loan Scheme (AALS)								-
Commercial Farms (Com-F)								

-	Incompatible, in competition	+	Can be combined	n/a	Combination not applicable

Whilst the different land use systems are largely incompatible, this does not mean that certain elements of a land use system cannot be combined with other land use practices. For instance, elements of community forestry or communal conservancies can be applied in other systems. SSCFUs, for example, are often established close to community forest areas. That means the resource base is similar and individual users could apply the same resource practices as farmers in a communal system and utilise the tree and firewood resources. In the context of this study, such combinations have not been considered, but one may reasonably assume that these resources are being used by the respective land owners.

10.2 Financial and economic comparison

10.2.1 Investment costs

The table below links investment costs of different land use systems with the area that was developed and the number of jobs that were created. It is based on the cases and models that were developed and described in Chapters 3 to 8.

Community forests are excluded from the table since there is presently almost no formal external investment in community forests. For the community conservancies, all analysed cases have been included individually, since the sizes differ and using averages is not very meaningful.

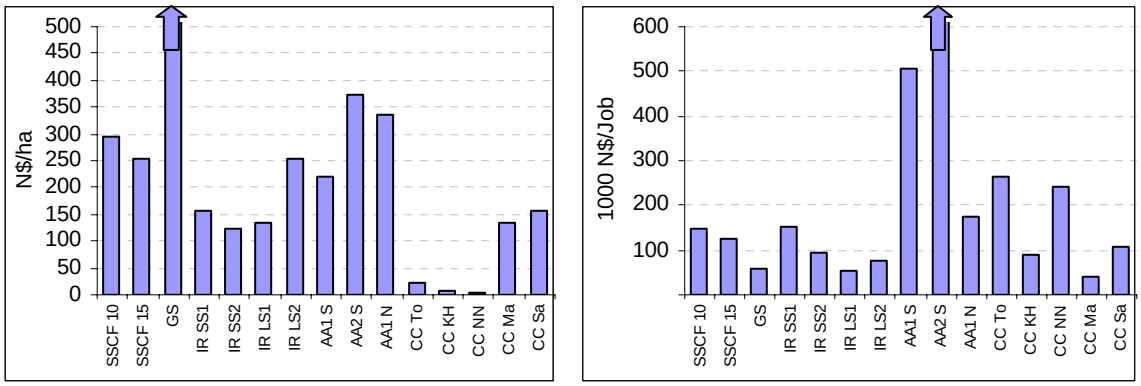
Table 10.2: Investment costs per ha and per job created

	Investm. costs (N$)	Area ha	Inv.C. per ha	Jobs created	Inv.C. per job cr.	Remarks
SSCF 51 cows (10ha/LSU)	293,546	1000	294	2	146,773	1,000 ha only used as basis for modelling
SSCF 34 cows (15ha/LSU)	252,746	1000	253	2	126,373	larger farms have slightly lower costs per ha / job
Green Scheme	13,545,000	200	67,725	230	58,891	complete unit for service prov. + 32 small scale farm.
IR Smallstock 1	459,660	2900	159	3	153,220	individual cases (not models)
IR Smallstock 2	377,010	3028	125	4	94,253	
IR Largestock 1	189,390	1400	135	3.5	54,111	
IR Largestock 2	261,810	1028	255	3.5	74,803	
AA1 South	2,277,720	10403	219	4.5	506,160	individual cases (not models)
AA2 South	3,847,710	10282	374	2.5	1,539,084	
AA1 North	2,074,410	6172	336	12	172,868	
CC Torra	2,377,955	108,586	22	9	264,217	Area shown represents only "Core Wildlife Area Size"
CC =/Khoadi //Hôas	1,066,943	177,560	6	12	88,912	which is smaller than the total conservancy size.
CC Nyae Nyae	3,882,102	900,300	4	16	242,631	No. of jobs created represent only paid labour employed
CC Mayuni	955,746	7,071	135	23	41,554	for the conservancies.
CC Salambala	1,733,637	11,000	158	16	108,352	

Source: Own calculations

SSCF = Small scale commercial (cattle) farming; GS = Green Scheme; IR = Individual Resettlement; AA = Affirmative Action Loan Scheme; CC = Communal Conservancy

Figure 10.1: Investment costs per ha and per job created



Clearly, land use concepts differ. Extensive land use systems (like communal conservancies) have extremely low investment costs per hectare and high costs per created job, while intensive land use systems (like the Green Scheme) show relatively low costs per created job and extremely high costs per hectare. In the case of resettlement schemes, there may be no net increase in jobs, as the farm labourers on what were formerly commercial farms may lose their jobs.

10.2.2 Financial and economic viability

As far as possible, the following coefficients were applied to compare the financial and economic viability of the different land use systems: annual income/profit per hectare, labour income per person (labour unit), and the return to capital invested (financial and economic rate of return).

Table 10.3: Comparative coefficients for the financial and economic viability of different land use systems

Land Use System*	Income/ Profit (N$/y)	Area (ha)	N$ per ha	Total lab. income**	Labour units	N$ per LabU	Financial IRR	Economic IRR
SSCF 15 - Low	3,378	1,000	3.38	15,378	2.3	6,686	2.15%	6.59%
SSCF 15 - Med	5,686	1,000	5.69	17,686	2.3	7,690	2.88%	7.26%
SSCF 15 - High	23,709	1,000	23.71	35,709	2.3	15,526	8.24%	12.42%
SSCF 10 - Low	22,381	1,000	22.38	34,381	2.3	14,948	6.28%	9.82%
SSCF 10 - Med	25,843	1,000	25.84	37,843	2.3	16,453	7.09%	10.58%
SSCF 10 - High	52,877	1,000	52.88	64,877	2.3	28,208	12.95%	16.40%
GS 0%	-143,647	200	-718.24	151,020	127	1,189	-4.20%	1.69%
GS 5%	419,950	200	2,099.75	753,950	135	5,585	2.90%	8.06%
GS 10%	983,547	200	4,917.74	1,356,880	143	9,489	8.60%	13.60%
GS 15%	1,547,144	200	7,735.72	1,959,811	151	12,979	13.70%	18.67%
IR small stock 1	40,945	2,900	14.12	40,945	3	13,648	17.82%	*(models:*
IR small stock 2	-3,272	3,028	-1.08	-3,272	4	-818	-1.74%	*≈ -7 to 12%)*
IR large stock 1	-107,781	1,400	-76.99	-85,137	3.5	-24,325	-113.82%	*(models:*
IR large stock 2	47,643	1,028	46.35	72,843	3.5	20,812	36.40%	*≈ -3 to 13%)*
AA1 South	26,402	10,403	2.54	52,922	4.5	11,760	2.53%	*(models:*
AA2 South	-125,507	10,282	-12.21	-111,507	2.5	-44,603	-6.27%	*≈ 1.3 to*
AA1 North	90,414	6,172	14.65	155,094	12	12,925		*≈ 20%)*
CC To	251,758	108,586	2.32	365,488	9	40,610	11.10%	71.80%
CC KH	-98,308	177,560	-0.55	43,094	12	3,591	15.59%	33.28%

CC NN	-624,765	900,300	-0.69	-487,527	16	-30,470	11.29%	11.29%
CC Ma	102,477	7,071	14.49	337,427	23	14,671	2.59%	45.34%
CC Sa	-84,908	11,000	-7.72	71,892	16	4,493	2.93%	19.61%
Firewood present	40,750	70,259	0.58	40,750	80	509		
Firewood future	70,750	86,280	0.82	70,750	80	884		
Timber	250,000	86,806	2.88	250,000	80	3,125		
Small-scale fuelw[a]							153%	
Small-scale poles[a]							84%	
Comm. saw timb.[a]							37%	
Small-scale Non-Timber Forest Products [a]							79%	

Source: Own calculations, except [a] = Barnes et al 2005

* SSCF = Small scale commercial (cattle) farming with 15 ha/LSU and 10 ha/LSU; GS = Green Scheme with different proportion of vegetables and fruits; IR = Individual Resettlement; AA = Affirmative Action Loan Scheme; CC = Communal Conservancy

** Income/Profit + Wages = Total labour income

The models from Chapter 3 have been used as basis for the SSCFUs. The chosen size of 1 000 ha is used as a basis for modelling. The effective farm sizes will differ according to the natural conditions. Two different scenarios are listed for the SSCFU according to different natural conditions: SSCFU 15 for conditions where 15 hectares are required per LSU and SSCFU 10 for 10 hectares per LSU. For each scenario, three different production levels (low, medium, high) show the effects of improved productivity and marketing. The low and medium levels represent conditions that were found during the survey amongst the interviewed farmers in the Mangetti Scheme while the high production level represents a hypothetical "imagine if" scenario that shows potential income and profitability if improved calving rates and demand-oriented marketing of high quality young oxen could be realised.

For the *Green Scheme*, the listed results are based on the models from Chapter 4. The model represents a complete 200 hectare unit with 100 hectares for the service provider and 100 hectares for 32 small scale farmers. The four variants listed show the results that would be obtained if 0% to 15% of the area was used to cultivate vegetables and fruit. The required labour units are calculated from the assumed labour costs for paid farm workers plus the members of the farming families. The increasing proportion of high value crops show the potential for income generation and profitability, and confirm that irrigation farming without such high value crops is not viable.

For *Individual Resettlement farms* (IR) and *Affirmative Action Loan Scheme farms* (AA) the results are taken from the individual cases that have been interviewed. The financial rates of return are calculated in a simplified static way assuming zero opportunity costs for land and family labour. Economic rates of return have only been available from model calculations (not from the individual cases) but, nevertheless, it was considered useful to show them in the table. The range of economic rates of return represents the model results for all four combinations of low/medium productivity and low/medium farm utilisation (for details, see Chapters 5 and 6). The results show clearly that farm land utilisation (far) below the potential is a major factor for unprofitable farming. Considering that resettlement schemes already were commercial farms before they were given to new owners, there may not be any additional economic value generated if not the new owner will work more efficiently than the previous one. This is also another reason for being not comparable to the other land use systems.

The results for *Communal Conservancies* (CCs) are taken from the model calculations for the five individual cases visited during the survey. It is important to note that it is extremely difficult (if not dangerous) to compare communal conservancies with individual farming activities since during the first ten years of the CC's establishment, the economic rates of return tend to be very positive due to the projected net immigration of game. However, this increase in livestock value is only applicable to the certain years and does not represent a sustainable situation. Additionally, the annual cash income (which is based on year 10 after establishment) is determined by government quota allocations for trophy hunting and cannot be influenced by management decisions.

Little financial data on *Community Forests* (CFs) could be obtained for analysis, since many communities started their forestry activities very recently and no long-term statistics exist. However, some profitability coefficients have been elaborated that are shown in the table above.

However, CFs and CCs are not land use systems in their own right and do not represent the major livelihood strategy of a community in those areas. The reality is that a community farms with crops and livestock in a certain area, and these enterprises provide the incomes of the respective households. CFs and CCs should be seen as additional enterprises undertaken by the community as a whole to put the presence of woodland, wildlife and biodiversity within the boundaries of their land to commercial use.

10.3 Conclusions

This report has provided an economic and financial analysis of six different land use options. These are:

- Small scale commercial farming units in communal areas (non-freehold land).
- Large scale and small scale irrigation under the Green Scheme.
- Farm unit and group resettlement.
- Affirmative Action Loan Scheme.
- Conservancies.
- Community forests.

Each of these options aims to address historical imbalances in access to agricultural land and a reduction of poverty by improving rural livelihoods.

The analysis has shown that all options have the potential to generate positive income streams for beneficiaries, thereby contributing to enhanced rural livelihoods. At the same time, however, each land use option also has the potential to place beneficiaries on a downward spiral of poverty and bankruptcy, if they are not able to use the resources at their disposal efficiently. This situation is illustrated by calculations for different production and utilisation levels as well as numerous sensitivity analyses. Such negative situations are likely to occur when farmers are moving their herds from communal land to an individual farm without improving their production and marketing practices to compensate for the additional costs, when irrigation farmers only rely on grain crops and omit growing vegetables and fruits, when resettlement or AALS farmers use only a certain fraction of their land resources instead of utilising their full potential, or when communities do not utilise their wildlife and wood resources efficiently due to inadequate access to markets and consumers, or low hunting quotas.

For optimum benefits to be achieved in all land use options it is essential for beneficiaries to have the necessary skills and knowledge to utilise the resources at their disposal more efficiently. Specifically, benefi-

ciaries need the skills to manage their respective enterprises effectively. They also need knowledge about the most efficient mix of products and the ability to put this knowledge into practice. The analysis has shown clearly that profits of irrigation farmers rise as the percentage of high value crops on their fields increases. Similarly, reducing the fattening period of young oxen will produce meat of a higher quality and thus generate more profit. Improved herd productivity through higher calving rates would have similar positive impacts on the profits of cattle farmers. Utilising the full potential of land resources is a fundamental precondition for profitability rather than having resources lying idle.

However, it must be stressed that knowledge is unlikely to yield positive results if beneficiaries cannot put this knowledge into practice. Training is urgently needed. The Green Scheme has made a start (MARDI), but such measures are also required for the other land use options. Most important of all, management skills are required that equip beneficiaries to be responsible decision-makers for their own economic units.

Beneficiaries must be market orientated. This is particularly important for those land use options where livestock production is the most important output. Livestock must be regarded as an economic asset and not (only) as a way to save wealth or obtain status. One way of achieving this is to ensure that selection criteria are designed in such a way that people who are likely be good farmers are selected as beneficiaries – such individuals are likely to be found amongst those with no other source of income.

Clear selection criteria, however, presuppose that the aims and objectives of increasing access to land and natural resources are clearly spelled out. More specifically, it must be clear whether welfare or production objectives should be pursued under the different land use options. This will not only have direct implications for government financing requirements and profitability of different enterprises, but also on economic and financial sustainability.

It is in this context that the issue of subsidies must be considered, since for all land use options the economic assessment tends to be more positive than the financial results. Subsidies would have a positive effect on the return to the capital invested by the beneficiaries. However, it is essential that subsidies are well targeted and do not amount to a grant as this would have a negative impact on the sense of ownership of implements and may lead to the inefficient use of resources and infrastructure. Offering subsidised loans is more likely to encourage the perception of ownership than directly subsidising initial infrastructure and equipment. (The latter may be regarded by beneficiaries as more helpful and could indeed be very effective if resources were efficiently utilised.)

In addition, access to (borrowed) capital is not only a problem with regard to initial investments in infrastructure and equipment, but the lack of working capital and money to allow a farm to progress over time (replacement and improvement of equipment and infrastructure, increase of herds) is a major constraint for sustainable and financially viable farm development. This was a problem in the past for farmers under the resettlement programme, but may also become a problem for beneficiaries of other land use options. Government should therefore consider programmes to help farmers gain access to loans for the described purposes, whether subsidised or not.

In presenting an analysis of six different land use options in one report, the temptation is great to compare the options with each other. In those cases where different land use options compete with another, the line of analysis presented in this report undoubtedly provides important pointers for decision makers. However, the results need to be interpreted with caution. Firstly, the analysis is based on many assumptions that need to be considered when making direct comparisons. Secondly, from an economic point of view,

the various land use options differ in terms of the opportunity costs of the land utilised: Small scale commercial farming units and the Green Scheme utilise land that is presently un- or underutilised and so whatever the generated profit is (if any), it will lead to a net value added for the economy. Community forests and conservancies are enterprises undertaken by communities to utilise existing woodlands, wildlife and biodiversity commercially, in addition to existing farming activities. As long as these existing farming activities are not reduced or negatively influenced, there will be no opportunity costs and the additional activities will generate net value added. However, if there should be any negative impact on existing activities, these opportunity costs will reduce the net value added. In the case of resettlement schemes and the AALS, it would be difficult to generate any net value added, since the farms have been commercial farms and continue to be commercial farms. Thus, there are opportunity costs for the farms and the net value added will be only the increment (if any).

It must be clear whether welfare objectives or production objectives are pursued by the various land use systems and these differences must be taken into consideration when comparing land use options.

Furthermore, a meaningful comparison of the different land use options would require an assessment of additional aspects, such as external and multiplier effects, distribution of benefits and their environmental impact in far more detail than was possible for this study. It is conceivable that the benefits of community forests or conservancies are more widely distributed among the members of poor rural communities than benefits generated by a commercial farm bought under the AALS. On the other hand, the economic benefits and multiplier effect of an AALS farm may be higher than those of a rural conservancy.

In a similar vein, this study did not assess the potential environmental impacts of different land use options. Economic and financial considerations have to be weighed against environmental sustainability where different land use options are possible. This makes it imperative that environmental impact assessments are carried out for specific land use options before they are embarked upon.

Nonetheless, what the study has highlighted is that most of the land use systems require considerable management and technical support to perform at a level that generates optimal returns to the respective target groups. Since the land use systems reviewed receive their implementation and other technical support from three different ministries, an analysis of the services crucial for the success of each of the land use systems would be useful. Such analysis would also indicate which ministry is best placed for the provision of the services and where close cooperation between ministries is required.