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SUSTAINABLE FINANCING OF PROTECTED AREAS IN MOZAMBIQUE: ESTIMATE OF COSTS AND CURRENT FINANCING SOURCES

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Table of contents

EXECUTIVE SUMMARY **1**
1 INTRODUCTION **4**
1.1 Financial planning for protected areas in southern Africa *4*
2 DATA COLLECTION **6**
3 SOURCES OF FINANCE AND FINANCIAL NEEDS ANALYSIS **7**
3.1 Parque Nacional do Banhine *7*
3.2 Parque Nacional do Limpopo *9*
3.3 Parque Nacional das Quirimbas *12*
3.4 Reserva do Gilé *14*
4 FINANCING GAPS **16**
5 DISCUSSION AND RECOMMENDATIONS **21**
REFERENCES **23**

List of tables

Table 1 Data availability, 2006 6
Table 2 Investment and operating expenditures (MZN), *Parque Nacional do Banhine*, 2005–2010 8
Table 3 Investment and operating expenditures (USD), *Parque Nacional do Banhine*, 2005–2010 8
Table 4 External financing and self-generated income (MZN), *Parque Nacional do Banhine*, 2005–2010 8
Table 5 External financing and self-generated income (USD), *Parque Nacional do Banhine*, 2005–2010 9
Table 6 Investment and operating expenditures (MZN), *Parque Nacional do Limpopo*, 2005–2010 10
Table 7 Investment and operating expenditures (USD), *Parque Nacional do Limpopo*, 2005–2010 11
Table 8 External financing and self-generated income (MZN), *Parque Nacional do Limpopo*, 2005–2010 11
Table 9 External financing and self-generated income (USD), *Parque Nacional do Limpopo*, 2005–2010 12
Table 10 Investment and operating expenditures (MZN), *Parque Nacional das Quirimbas*, 2005–2010 13
Table 11 Investment and operating expenditures (USD), *Parque Nacional das Quirimbas*, 2005–2010 13
Table 12 External financing and self-generated income (MZN), *Parque Nacional das Quirimbas*, 2005–2010 14
Table 13 External financing and self-generated income (USD), *Parque Nacional das Quirimbas*, 2005–2010 14
Table 14 Investment and operating expenditures (MZN), Reserva do Gilé, 2005–2010 15
Table 15 Investment and operating expenditures (USD), *Reserva do Gilé*, 2005–2010 15
Table 16 External financing and self-generated income (MZN), *Reserva do Gilé*, 2005–2010 16
Table 17 External financing and self-generated income (USD), *Reserva do Gilé*, 2005–2010 16
Table 18 Annual estimated financing gap (MZN), 2005–2010 17
Table 19 Annual estimated financing gap (USD), 2005–2010 17
Table 20 Total estimated financing gap (MZN) 18
Table 21 Total estimated financing gap (USD) 18
Table 22 Average estimated financing allocation (income and expenses) per km^2 (MZN) 19
Table 23 Average estimated financing allocation (income and expenses) per km^2 (USD) 19
Table 24 Key expenditure and income ratios, all protected areas (%), 2005–2010 20

Acronyms

DNAC	*Direcção Nacional de Áreas de Conservação* / National Directorate of Conservation Areas
DNFFB	*Direcção Nacional de Florestas e Fauna Bravia* / National Directorate of Forestry and Wildlife
DS&I	Development Services and Initiatives
GoM	Government of Mozambique
RG	*Reserva do Gilé* / Gilé Reserve
MITUR	*Ministério do Turismo* / Ministry of Tourism
MZN	New Mozambique Metical
PNB	*Parque Nacional do Banhine* / Banhine National Park
PNL	*Parque Nacional do Limpopo* / Limpopo National Park
PNQ	*Parque Nacional das Quirimbas* / Quirimbas National Park
SANParks	South African National Parks
TFCA	Transfrontier Conservation Area
ZAWA	Zambian Wildlife Authority
ZAR	South African Rand
$N	Namibian Dollar
$US	United States Dollar

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EXECUTIVE SUMMARY

The project on Sustainable Financing of Mozambique's Protected Areas of the World Wide Fund for Nature aims to serve as a catalyst to support the development of a national sustainable financing strategy for the national protected area network. In order to achieve financial sustainability for this network, Mafisa Media was commissioned to undertake an analysis of the current costs and financing mechanisms of Mozambique's protected areas, based on existing information. The work entailed a review of business plans, analysis of financial requirements, financing and status of PAs, and the development of a consolidated financial model that summarised current costs and revenue, projected future costs and financing gaps.

Only four studies are available from the southern African region, which examine the costs and benefits of national conservation estates. These were conducted in Mozambique, Namibia, South Africa and Zambia between 1997 and 2004. All four studies found that each national protected area network suffered from financing deficits when all of the costs of managing the networks were taken into account. However, all these reports noted that while the networks may not have been financially viable, their contributions to the economy of each country (primarily through tourism development) meant that investments in their operation were considered justified.

Obtaining data for this study proved difficult – no actual income or expenditure data for any protected area within Mozambique was made available. Sufficient information for only four sites was sourced, despite active engagement with more than nine individual protected areas, a number of non government organisations, as well as the Government of Mozambique (GoM). Therefore the analysis relies primarily on business and management plans, forecast Government of Mozambique budget allocations and partial information about actual and anticipated donor financing. The four sites analysed in this report are the *Parque Nacional do Banhine* (PNB, Banhine National Park), *Parque Nacional do Limpopo* (PNL, Limpopo National Park), *Parque Nacional das Quirimbas* (PNQ, Quirimbas National Park) and *Reserva do Gilé* (RG, Gilé Reserve). The analysis presents results for the years 2005–2010, as the forecast allocations to individual protected areas by the GoM were available for this period. All figures are presented in New Moçambican Meticais (MZN); while all forecasts used in the analysis were prepared prior to the introduction of the MZN in July of 2006, they have been converted to the new currency. Estimates presented in US dollars used the average exchange rate between MZN and USD over the six weeks prior to the finalisation of this report (1MZN:0.03982USD).

Total estimated annual expenditure in PNB ranged between MZN14.5 million and MZN23 million between 2005 and 2010. Over the six years, 15 per cent of this was spent on infrastructure and park development (ranging between seven and 42 per cent per annum), the remaining 85 per cent being allocated for operating cost expenditures (which varied between 58 and 93 per cent per annum). Of the operating costs spent in PNB, 75 per cent were earmarked for human resource expenditures, with the remaining 25 per cent for other operating costs.

PNB is projected to generate an annual income of between MZN2.4 million and MZN4.1 million, though no information on levels of donor funding was available, so this is underestimated, as at least one donor funded project is being undertaken within the park. Of the estimated income, 45 per cent was from GoM allocations (55 per cent for personnel costs and 45 per cent for goods and services, no allocation for capital), and 55 per cent from 'own-generated' income. Concession fees generated a total of 50 per cent of 'own-generated' income (gradually declining over the years from 66 per cent to 42 per cent), entry and activity fees generated seven per cent, and hunting and live game sales is estimated to generate 42 per cent (increasing from 25 per cent to 52 per cent).

These figures result in an average annual financial deficit for PNB of approximately MZN12 million, totalling MZN76 million across the six years, though annual deficits declined slightly year on year.

However, as noted, this is likely to be overestimated as information regarding actual donor funding is not available.

Total estimated annual expenditure in the period 2005–2010 in PNL ranged between MZN57 million and MZN286 million. Over the six years, 63 per cent of this was spent on infrastructure and park development, the remaining 37 per cent being allocated for operating cost expenditures. Of the operating costs spent in PNL, 71 per cent were earmarked for human resource expenditures, with the remaining 29 per cent for other operating costs.

PNL is estimated to generate an annual income of between MZN31.8 million and MZN308.6 million. Of this 87 per cent will be from donor funding, the GoM allocated no funding at all to the PNL, and 13 per cent will be from 'own-generated' income. Of the 'own-generated' income, concession fees are estimated to generate an average of 91 per cent and entry and activity fees an average of 9 per cent.

Though PNL is estimated to run a financial deficit in four out of the six years of analysis. Because of uncertainty about future donor allocations (for 2009 and 2010), estimates using the available information suggest that the park will generate a deficit across the six years of MZN240.8 million.

Total estimated annual expenditure in PNQ ranged between MZN9.6 million and MZN25 million, 2005–2010. Over the six years, 29 per cent of this was spent on infrastructure and park development (ranging between seven and 56 per cent per annum), the remaining 71 per cent being allocated for operating cost expenditures (which varied between 44 and 65 per cent per annum). Of the operating costs spent in PNQ, 41 per cent were earmarked for human resource expenditures, with the remaining 52 per cent for other operating costs, two per cent for the MITUR Fund for Tourism Development and five per cent for the PNQ Community Development Fund. PNQ was the only site to make explicit provision for the latter two of these costs.

An annual income of between MZN10.1 million and MZN27.6 million was estimated to be generated by PNQ. Of this 80 per cent was from donor funding, three per cent from GoM allocations, and 17 per cent was from 'own-generated' income. Of the 'own-generated' income, concession fees generated an average of 49 per cent (decreasing from 67 to 40 per cent in the five years following 2005) and entry and activity fees generated an average of 41 per cent (increasing from 33 to 60 per cent in the five years to 2010).

The PNQ is estimated to run an average annual financial surplus of approximately MZN1.6 million, totalling MZN9.6 million in the years 2005–2010.

Total estimated annual expenditure in RG ranged between just MZN1 million and MZN1.7 million in the period 2005–2010. Over the six years, 41 per cent of this was spent on infrastructure and park development (ranging between 23 and 51 per cent per annum), the remaining 59 per cent being allocated for operating cost expenditures (which varied between 48 and 77 per cent per annum). Of the operating costs spent in RG, 53 per cent were earmarked for human resource expenditures, with the remaining and 47 per cent for other operating costs.

An annual income of between MZN1.3 million and MZN2.2 million was estimated to be generated by RG. Of this only one per cent was from donor funding, and the remaining 99 per cent is expected to be sourced from Government of Mozambique allocations. No complete business plan is available for RG, and no information was forthcoming about its ability to generate its own income from tourism developments and activities. Thus, it is likely that the total income of the reserve is underestimated.

RG is the second protected area that is estimated to run an average annual financial surplus in five of the six years considered. Though small, these surpluses are estimated at approximately MZN0.5 million per annum, totalling MZN3.2 million in the years 2005–2010. This reserve is included in the

report as an example of what could potentially be achieved in small protected areas with limited funding. It should be noted that, at present, very little activity occurs on the ground in the RG.

It must be noted that the results reported are not all based on 'real' or actual income or expenditure, but upon business plans drawn up for each of the protected areas, which tend to represent the ideal – without funding constraints (with the possible exception of the RG). The first step towards sustainable financing will be to rectify the absence of actual financial data. It will not be possible to plan ahead for a sustainably financed network, if the planners do not know where they are starting from.

A sound financial management system must be introduced into the protected area network, and a number of steps will need to be taken. As part of this system, business and management plans will need to be developed – preferably by or with park staff – for each protected area. Annual workplans based on the priority actions identified can then be developed, which should be simple and achievable. Activities in the workplan need then to be costed to determine the required annual budget, and activities should be implemented only if they are sufficiently well resourced to be effective.

A sound system will also require devolution of decision making capabilities to Park Managers, who can adapt both budgets and activities in response to the realities on the ground, and any changes that may occur. These decisions should be undertaken within sound financial management controls, but don't require overtly bureaucratic systems and procedures. Within such a system, staff should be rewarded for meeting the outcomes of the annual plans and for their sound financial management and control, rather than for following the correct procedures in spending donor and government funds, as is often currently the case.

At the protected area network level, there is a need for accounting systems that create cost centres which relate to management activities. For these cost centres, targets should be set (and modified where appropriate) and monitored to make sure they're met within defined budgets. The implications of investments in the network should be examined carefully in terms of cost and income implications; future maintenance costs of large capital investments and high tech equipment are often overlooked, and can becomes a serious drain on finances sometimes without significant income streams being derived from them.

1 INTRODUCTION

One of the key challenges to global biodiversity conservation is the existence of a financing gap for effective management of protected areas – it is generally believed that insufficient investment has been made in the protection of biodiversity, and protected areas in particular. In order for Mozambique to determine the sustainability of its financing arrangements, an assessment of the system's current financing needs will need to be undertaken, and a national sustainable financing strategy will need to be developed. The project on Sustainable Financing of Mozambique's Protected Areas aims to serve as a catalyst to support the development of a sustainable financing strategy for the national protected area network. In preparation for an upcoming conference, Mafisa Media was commissioned to prepare a background paper to analyse the current costs and financing sources of Mozambique's protected areas. This report provides a desk-based analysis of the current costs and financing sources of a number of Mozambique's protected areas, and a crude financial model summarising current and project costs and revenue of these sites.

1.1 Financial planning for protected areas in southern Africa

Elsewhere in southern Africa, there are only four studies available that estimate the costs of management for protected area systems. Martin (1997) undertook a study in Mozambique outlining a programme of investment for the forestry and wildlife sector. The same author also undertook a study in 2004 for South African National Parks to estimate operating budgets and staff structures for individual parks in that country. Also in 2004, an economic analysis and financial feasibility study of the protected area network in Namibia was undertaken (Turpie et al., 2004), while Development Services and Initiatives undertook a similar study in Zambia in that year (DS&I, 2004). It is almost certain that other, similar, studies have been undertaken, but they are not accessible (i.e. not published), and likely only available as 'grey literature' (i.e. consultancy reports).

The objective of Martin (1997) was to develop a programme to conserve and use flora and fauna resources in Mozambique in a rational and sustainable manner, for the economic, social and ecological benefit of current and future generations of Mozambicans. The report noted that between 1992 and 1995, the budget for the sector had been reduced from the equivalent of MZN3.5 million to the equivalent of MZN2.1 million due to the reduction in the national budget over that time, the depreciation of the currency and the low priority of the sector. However, according to the programme developed, by year four of the project (2001), projected income was estimated to exceed operating costs of $US5 million per annum, and by 2007, revenues could reach $US25 million. The report estimated that approximately half of this revenue was derived from protected areas and wildlife and the other half was generated by productive forests. Of the approximately $US12.5 million generated from wildlife and protected areas, it was estimated that 42 per cent of this would be generated by national parks. Such revenues would be possible following the project funding of approximately $US47 million – $US30.3 million for investment and $US16.6 million in recurrent costs.

At the time the report was written, the *Direcção Nacional de Florestas e Fauna Bravia* (DNFFB, the National Directorate of Forestry and Wildlife within the Ministry of Agriculture and Fisheries) was responsible for the management of the protected area network. At that time, it had approximately 573 employees, around 73 of them in headquarters at DNFFB, and 500 with the provincial forestry and wildlife services. These employees were said to be irregularly and insufficiently distributed across the approximately 100,000 km^2 protected area network within the country, and the inadequacy of their numbers was made worse by the lack of technical and trained professionals within their ranks, as well as the inadequate equipment they had to rely on. The report suggested an increase in staff numbers of around 800 individuals, with approximately half for the protection of wildlife, and the other half for the management and control of productive forest areas (Martin, 1997).

Turpie et al., (2004) undertook a study to describe the economic value of the protected area network in Namibia and to investigate options for improving the financing of the system. At the time the report

was written, total operating costs of the Namibian protected area system were approximately $N156 million and revenues were approximately $N73 million, of which 90 per cent were generated by gate entry fees and accommodation. (All accommodation revenues in Namibia are returned to the parastatal Namibian Wildlife Resorts, and are thus not available to cover the conservation and management costs of protected areas.) That is, total revenues were just 47 per cent of operating costs from the 21 protected areas in the country. Of these operating costs, approximately 26 per cent were conservation and management costs (including some development expenditures), the remainder being costs associated with tourism development and management.

A model was then used to derive the costs of a more efficiently managed protected area system, which estimated that 1,500 staff would be needed for conservation management activities (up from the 1,100 employed at the time), and approximately 440 staff for tourism related duties. The model estimated recurrent costs to be $N127 per annum, approximately 86 per cent ($N106 million) for conservation management and the remainder (17 per cent, $N21 million) for tourism related expenditures. Of the amount estimated as required for conservation management, $N67 million was thought necessary as allocation to the park level (63 per cent) and $N39 million (33 per cent) to cover cluster and head office costs (Turpie et al., 2004).

The South African study (Martin, 2004) used a model (developed further from Martin's work in Mozambique) to determine thresholds for the absolute minimum annual recurrent expenditures needed for conservation and management of South Africa's National Parks. The report estimated that approximately ZAR118 million would be needed to meet the conservation and management requirements of all parks (just in excess of 50 per cent of which would be human resources costs). Costs associated with tourism were estimated at ZAR134 million (or 114 per cent of conservation costs), giving a total parks budget (i.e. excluding head office costs) of ZAR252 million (approximately eight per cent higher than the current actual budget at the time).

Gross income earned by South African National Parks (SANParks) of ZAR308 million exceeded the (actual and modelled) costs of conservation and tourism in the parks; the surplus being contributed by only three of the 21 National Parks in the country. However, a financing gap appeared when central administration and management were considered – cluster and head office costs increased total operating costs of SANParks to in excess of ZAR500 million, or approximately ZAR194 million greater than income earned (before government or donor subsidies) (Martin, 2004).

The report notes that while the majority of parks are not financially viable, it is likely that they are economically – their role in local, provincial and national economies may justify simple financial losses (Martin, 2004). The model ensures consistency across all parks in terms of staffing levels and their associated operating costs. However, when considering actual figures, it can be seen that those parks with few visitors receive relatively small budgets, while those with high tourism income have disproportionately high human resource and operating costs (Martin, 2004).

Development Services and Initiatives in their Zambian study (DS&I, 2004) noted that $US6–7 million would be required to manage Zambia's protected area network each year, rising to around $US9 million per annum if it was to be managed well (i.e. if park depletion was combated). The report further estimated that approximately $US5 million per annum would be necessary to undertake the necessary conservation management, as the costs of managing tourism development could be covered by the income generated by tourism activities within the protected areas. At the time of writing, tourism generated approximately $US1.7 million for the Zambian Wildlife Authority (ZAWA), and had the capacity to increase by between $US0.5–1 million per annum by 2009. In order for ZAWA to generate sufficient income to cover operating costs, the report estimated that over the following 10 years approximately $US50 million would be needed to support recurrent expenditures, and a further $US100 million in capital investments would be required.

In 2003, ZAWAs operating costs were approximately $US5.5 million. Human resource costs were around 36 per cent of operation costs (including overheads), while field expenses were around two-thirds of total operational costs (with regional costs accounting for eight per cent, and head office costs accounting for 25 per cent). Approximately $US3.5 million in income was generated from hunting in Game Management Areas (45 per cent), tourism generated approximately 50 per cent of ZAWAs income, and four per cent was derived from other sources. The report estimated that almost 90 per cent of tourism income was generated from just four national parks within Zambia (DS&I, 2004).

Author calculations suggest that there was an actual financial gap of approximately $US2.5 million per annum, which could increase over the short term to $US2.8–5.7 million per annum.

2 DATA COLLECTION

Relevant authorities including government and various non government organisations were repeatedly requested to provide relevant protected area information to enable the analysis of financing gaps in five protected areas in Mozambique. Information was sought about seven national parks (Banhine, Bazaruto Archipelago, Gorongosa, Limpopo and Quirimbas) and two reserves (Gilé and Niassa), by contacting the protected area managers directly, the appropriate staff at the *Direcção Nacional de Áreas de Conservação* (DNAC, the National Directorate of Conservation Affairs within the Ministry of Tourism), as well as relevant non government organisations. The type of information requested included management and business plans for individual parks and reserves (including detailed budgets and financial planning information drawn up by GoM and/or donors), sources (and amounts) of finance from all sources, asset and equipment inventories, staff numbers and salary levels, training needs assessments and tourism development plans. Requests were made for this information with respect to individual protected areas, as well as for the network as a whole through DNAC. Although the data collection was conducted over an extensive period, much of the requested information was not forthcoming. Complete information was not available for a single protected area, though sufficient data was collected to report results for three national parks and one reserve –Banhine, Limpopo, Quirimbas and Gilé. The information that was available for these parks (and that collected for the project as a whole) can be seen in Table 1.

Table 1 Data availability, 2006

Protected Area		**Banhine**	**Bazaruto**	**Gilé**	**Gorongosa**	**Limpopo**	**Niassa**	**Quirimbas**	**Zinave**
Business Plan		Y	-	P	-	D	-	D	-
Business Plan (spreadsheets)		Y	-	P	-	Y	-	Y	-
Management Plan		D	Y	Y	-	Y	P	Y	D
Staff numbers and salaries (GoM)		Y	Y	P	Y	P	-	P	Y
Inventory	Human Resources	Y	U	Y	Y	-	Y	N	-
	Transport	Y	U	Y	Y	-	Y	N	-
	Infrastructure	Y	U	Y	Y	-	Y	N	-
	Other equipment	Y	U	Y	Y	-	Y	N	-
Donor funding		N	P	P	Y	P	P	P	-
Government revenue		N	N	N	N	N	N	N	N
Government expenditure		F	F	F	F	F	F	F	F

D = draft; F = forecast; P = partial; U = unofficial; Y = yes; - = not available.

The analysis has focussed on the years 2005–2010, as these were the only years for which we were able to obtain estimated government expenditure in the various parks. While these estimated expenditures were disaggregated into capital, personnel and operating expenditures, unfortunately no information about actual expenditures or actual or forecast revenues generated by protected areas was available from the Government of Mozambique (GoM). These estimates appeared to be the most

reliable of sources available from DNAC. Several of the business plans made forecasts beyond 2010 which can be found in the original business plans if required.

Note should be taken of the currencies reported in the analysis below. All business plans (and estimates of government expenditures) were undertaken prior to the change in the currency in July 2006. However conversions were undertaken, so all values are reported in New Mozambique Metical (MZN).

Each table presented in the analysis below, unless otherwise indicated, is the result of author calculations, manipulating data from the various sources presented in Table 1.

3 SOURCES OF FINANCE AND FINANCIAL NEEDS ANALYSIS

3.1 Parque Nacional do Banhine

The *Parque Nacional do Banhine* (PNB, Banhine National Park) was proclaimed in 1973, and is approximately 7,000 km^2 in size. The draft management plan of the park outlines the vision statement and several major objectives – to restore PNB to its former state (or as close as possible); for the government to co-manage the park with the local community; to ensure land and local resource use remains sustainable, and protect PNB from external resource use pressures. The management plan identifies a number of activities, including the desire to restock some game into an enclosed area of the park, to develop the infrastructure of the park; to use the resources of the park to develop local eco- and cultural-tourism; and to integrate the park into the larger TFCA planning and development framework (Anon, 2003a).

A number of threats to park resources were identified in the management plan. Many of the threats to plant resources were identified as potential, rather than current threats – including increases in the population living in (or with access to) the park potentially increasing plant harvesting to unsustainable levels; potential threats from tourism (e.g. off-road driving); wildfires; invasive alien plant species; and the theft of rare and endangered plants. Habitat destruction, poaching, human–wildlife conflict and the transmission of disease from livestock were identified as the principle potential threats to wildlife. In terms of rare, endemic and endangered species specifically, threats identified were the illegal commercial exploitation of fauna and flora (e.g. birds and hardwood timber) and the overuse of magico-medicinal plants and animals (Anon, 2003a).

3.1.1 Forecast *Parque Nacional do Banhine* Finances

The PNB Business Plan estimated the 'first cut' of likely costs and possible income which could be generated by the park, based on the draft management plan. The business plan intended to indicate the order of funding required to develop the plan, rather than an outline of precise costs and income. The plan was separated out two cost structures – initial planning and development (excluding park staff costs) and ongoing maintenance (broadly staff, vehicles, other specific requirements) (Busico et al., 2003).

Development and planning costs (i.e. capital expenditure) for the park was allocated to different programmes according to the needs stated in the management plan – including ecology, research and monitoring, tourism and tourism development, community, environmental management, protection and field services, infrastructure, administration, game introduction and fencing, and infrastructure and equipment. The largest investments, by far, over the life of the project are those associated with tourism development (around one quarter of investment expenditure) and infrastructure development (approximately 20 per cent) (Busico et al., 2003). Given the low base from which the park started, this would seem reasonable. However, as one of the objectives of the park is to become a co-managed protected area, with the Banhine community, the estimated allocation of just one per cent of investment expenditure on community activities would seem an underestimate. Building the capacity of community representatives and institutions, and providing appropriate technical assistance to

ensure that the community is able to be a meaningful partner in the park's management would be expected to require high time and resource costs. Tables 2 and 3 outline investment and operating expenditures of PNB.

Table 2 Investment and operating expenditures (MZN), *Parque Nacional do Banhine*, 2005–2010

	2005	2006	2007	2008	2009	2010
Investment expenditure	**9,674,107**	**1,020,536**	**1,020,536**	**1,020,536**	**1,020,536**	**1,020,536**
Operating costs						
Human resources	10,151,015	10,151,015	10,151,015	10,151,015	10,151,015	10,151,015
Other operating costs	3,339,265	3,339,265	3,339,265	3,339,265	3,339,265	3,339,265
Sub-total (operating costs)	**13,490,280**	**13,490,280**	**13,490,280**	**13,490,280**	**13,490,280**	**13,490,280**
Total annual expenditure	**23,164,387**	**14,510,816**	**14,510,816**	**14,510,816**	**14,510,816**	**14,510,816**

Source: Author calculations based on Busico et al., 2003; DNAC, n.d.

Table 3 Investment and operating expenditures (USD), *Parque Nacional do Banhine*, 2005–2010

	2005	2006	2007	2008	2009	2010
Investment expenditure	**385,200**	**40,600**	**40,600**	**40,600**	**40,600**	**40,600**
Operating costs						
Human resources	404,200	404,200	404,200	404,200	404,200	404,200
Other operating costs	133,000	133,000	133,000	133,000	133,000	133,000
Sub-total (operating costs)	**537,200**	**537,200**	**537,200**	**537,200**	**537,200**	**537,200**
Total annual expenditure	**922,400**	**577,800**	**577,800**	**577,800**	**577,800**	**577,800**

Source: Author calculations based on Busico et al., 2003; DNAC, n.d.

The authors note that the greatest area of uncertainty within the plan is that relating to the wildlife model; it is not known whether further research by DNAC has been undertaken to determine the accuracy of these estimates and their impact on the viability of the plan.

Table 4 External financing and self-generated income (MZN), *Parque Nacional do Banhine*, 2005–2010

	2005	2006	2007	2008	2009	2010
External financing						
Donors	n/a	n/a	n/a	n/a	n/a	n/a
GoM allocation – Personnel	629,650	705,210	789,830	884,610	990,770	1,109,660
GoM allocation – Goods & services	456,350	511,110	572,440	641,140	718,070	804,240
GoM allocation – Capital	0	0	0	0	0	0
Own income						
Concession income	891,795	891,795	891,795	891,795	891,795	891,795
Entry and activity fees	127,802	127,802	127,802	127,802	127,802	127,802
Hunting and live game sales	332,034	526,243	634,311	905,264	1,113,569	1,251,394
Total annual income	**2,437,631**	**2,762,160**	**3,016,178**	**3,450,610**	**3,842,005**	**4,184,891**

Source: Author calculations based on Busico et al., 2003; DNAC, n.d.

Table 5 External financing and self-generated income (USD), *Parque Nacional do Banhine*, 2005–2010

	2005	2006	2007	2008	2009	2010
External financing						
Donors	n/a	n/a	n/a	n/a	n/a	n/a
GoM allocation – Personnel	25,000	28,100	31,500	35,200	39,500	44,200
GoM allocation – Goods & services	18,200	20,400	22,800	25,600	28,600	32,000
GoM allocation – Capital	0	0	0	0	0	0
Own income						
Concession income	35,500	35,500	35,500	35,500	35,500	35,500
Entry and activity fees	5,100	5,100	5,100	5,100	5,100	5,100
Hunting and live game sales	13,200	21,000	25,300	36,000	40,000	43,700
Total annual income	**97,100**	**110,000**	**120,100**	**137,400**	**148,600**	**160,500**

Source: Author calculations based on Busico et al., 2003; DNAC, n.d.

This business plan (Busico et al., 2003) was the only one of the four examined to in detail which estimated income from hunting and live game sales (when sufficient game are available for harvesting); income is also expected to be generated from park entry fees. Estimated income would seem to be conservative – particularly as income from entry fees appears not to increase over time, as would be expected, though estimated recurrent costs (i.e. staff, vehicles and other operating expenses) do appear more realistic. According to the plan, over the five year period, PNB is estimated to earn 50 per cent of 'own income' from concession fees, 42 per cent from live game sales and seven per cent from entry and activity fees. However, inflation appears not to have been factored in to the estimates – perhaps because of the volatility of the currency and uncertainty about future inflation levels in the country at the time the plan was developed. Income projections were not based on the prices set out in the Table of Tariffs, as the plan was prepared prior to their release by the Council of Ministers – concession fees in the business plan are likely to be somewhat overestimated (based on a percentage of turnover of the concessionaire), while entry and activity fees appear to have been underestimated. As a result, it is thought that the business plan may underestimate the potential income generating capacity of the PNB.

No information is available regarding the contribution of international or national donors to the investment or operating expenditures of PNB, though at least one donor (the African Wildlife Foundation) has a project being undertaken within the park. Some information is available from GoM regarding predicted expenditure between 2005 and 2010 (see Tables 4 and 5). Over this period, no GoM funds are allocated to capital expenditure, though allocations are made to personnel (58 per cent) and other operating costs (42 per cent). Funds allocated by GoM to personnel costs would seem to cover the (reported) salaries of the 26 rangers in the park, in addition to a number of more skilled technical staff, though there is no information available suggesting that PNB employs any staff beyond the ranger level. Approximately half of own income is generated from concession fees, with 42 per cent from hunting and live game sales. Just seven per cent of estimated own income is raised from entry fees to the park.

3.2 Parque Nacional do Limpopo

The area now known as the *Parque Nacional do Limpopo* (PNL, Limpopo National Park) was formerly used as a hunting zone – Coutada 16. It was proclaimed as a National Park in 2001 and is approximately 10,000 km^2. The first edition of the management plan for the park was finalised in 2003. The plan outlines the vision and mission of the park, as well as identifying several management objectives, including the maintenance of its wilderness character, ensuring its integration into the TFCA planning and development framework, ensuring the participation of local communities in the development and management of the PNL, and the equitable flow of benefits to these communities. The management plan also identifies the need to manage and develop the PNL in the interests of the people of Mozambique, with respect to biodiversity conservation and to making a socio-economic contribution to the region and country, and to promote responsible tourism as a means of generating

income for the PNL and driving sustainable socio-economic development in and around the park (PIU, 2003a).

The plan identifies potential threats to plant biodiversity, including the unsustainable harvesting of plant resources for subsistence use (including particularly charcoal production and medicinal uses), the negative impacts of tourism activities (e.g. 4x4 trails and off-road driving), wildfires, the (potential) spread of alien and invasive plants and the theft of rare and/or endangered species. Additional threats to the integrity of the park identified in the plan include habitat destruction, poaching, human–wildlife conflict, disease transmission from livestock, and the illegal commercial exploitation of plant and animal species (e.g. hardwood timber, cycads and birds) (PIU, 2003a).

3.2.1 Forecast *Parque Nacional do Limpopo* Finances

The Business Plan for the PNL was prepared for Phase I of a programme of funding from the Kreditanstalt für Wiederaufbau (KfW, German Bank for Reconstruction and Development) and to set the scene for the potential Phase II project. Thus investment expenditures and operating costs were estimated for the three years of the project (2004–2006), which has been extended to 2010. Details of the plan are based on the vision statement and goals described in the management plan for the PNL. Implementation is phased, and the goals of Phase I focus on the legal establishment of the park, institution building, the development of PNL, and on training and the support zone programme. The plan assumes that by 2006 PNL will be fully operational, with all management infrastructure and administration in place. Actual donor funding for the first two years of Phase II (2007 and 2008) have been used in the analysis below.

Given the low base from which the PNL started, and the political importance placed on the success of the Great Limpopo Transfrontier Park, massive capital investments[1] are outlined in the business plan for the PNL. The support zone programme (primarily relocation of park residents and boundary realignment) accounts for 49 per cent of investment expenditure, one third is allocated to administration (including transport and equipment purchases, as well as building/rehabilitation of roads, signage, and other infrastructure). Almost 20 per cent of the investment budget has been allocated to the protection programme (i.e. ecological protection), with the remainder shared between tourism development, research and monitoring and participation on the Great Limpopo Transfrontier Park Board. The extremely high planned investment expenditure implies a possibly over-capitalisation of the protected area, though the high costs associated with resident relocation may mean that investments in productive investments are not excessive.

Table 6 Investment and operating expenditures (MZN), *Parque Nacional do Limpopo*, 2005–2010

	2005	2006	2007	2008	2009	2010
Investment expenditure	**111,838,739**	**74,343,348**	-	-	**18,433,183**	**18,433,183**
Operating costs						
Human resources	15,660,980	16,455,648	-	-	27,382,308	32,448,035
Other operating expenditures	5,714,753	6,950,120	-	-	11,565,046	13,704,579
Sub-total (operating costs)	**21,375,734**	**23,405,768**	-	-	**38,947,353**	**46,152,614**
Unallocated expenditure*	n/a	n/a	**286,833,167**	**286,833,167**	n/a	n/a
Total annual expenditure	**133,214,473**	**97,749,116**	**286,833,167**	**286,833,167**	**57,380,157**	**64,585,797**

* Disaggregated expenditure data are not available.

Source: Author calculations based on PIU, 2003b; DNAC, n.d.; AFD, 2006.

[1] All ratios reported for PNL expenditure data have been calculated using data from the Phase I business plan and exclude the 2007 and 2008 Phase II funding, for which disaggregated expenditure data is not available.

Table 7 Investment and operating expenditures (USD), *Parque Nacional do Limpopo*, 2005–2010

	2005	2006	2007	2008	2009	2010
Investment expenditure	**4,453,400**	**2,960,400**	-	-	**734,000**	**734,000**
Operating costs						
Human resources	623,600	655,300	-	-	1,090,400	1,292,100
Other operating expenditures	227,600	276,800	-	-	460,500	545,700
Sub-total (operating costs)	**851,200**	**932,000**	-	-	**1,550,900**	**1837,800**
Unallocated expenditure*	n/a	n/a	**11,421,697**	**11,421,697**	n/a	n/a
Total annual expenditure	**5,304,600**	**3,892,400**	**11,421,697**	**11,421,697**	**2,284,900**	**2,571,800**

* Disaggregated expenditure data are not available.
Source: Author calculations based on PIU, 2003b; DNAC, n.d.; AFD, 2006.

Human resource costs (see Tables 6 and 7) are high, with approximately 180 staff reportedly employed in the park. This gives a staff/km^2 ratio of more than double that of any of the other parks under consideration. In addition to this, estimated average salaries of staff employed at PNL are higher than those offered by GoM in other parks and reserves. Operating costs are increased for each year estimated, suggesting that inflation has been factored in to these estimates; however at an average yearly increase of 18.5 per cent, this would seem to overestimate inflation and therefore real park operating costs. Total costs estimated within the business plan for the period 2003–2006 exceed donor funding by more than MZN277 million (€10 million).

A unique agreement allows all revenue generated by the PNL to be returned back to the PNL operational budget, an incentive for PNL to become actively involved in revenue generation and fundraising. It appears that the estimates for income from entry fees use prices that are considerably higher than those set out in the Table of Tariffs. This means that the business plan probably overestimates income derived from tourist entries to the park. Of the estimated self-generated income, approximately 91 per cent is raised through concession fees, and just 9 per cent from entry and activity fees charged by the park.

Some information regarding the level of donor funding to the park is included in the business plan (the funding provided for Phase I of the KfW project). Information regarding the funding for Phase II was available for 2007 and 2008, but not for 2009-10. These funds are expected to be received from *Agence française de développement* (AFD, the French Development Agency), KfW, *Deutsche Gesellschaft für Technische Zusammenarbeit* (GTZ, the German Agency for Technical Cooperation) the World Bank and the Peace Parks Foundation. According to the five year forecast of GoM funding allocations to parks and reserves, PNL does not receive any funding, for any purpose, from central government budget allocations. In a summary budget of Phase II donor financing, GoM is estimated to provide €380,000 in 2007 and 2008. In order to retain the conservatism of this analysis, this amount has been excluded from the analysis below.

Table 8 External financing and self-generated income (MZN), *Parque Nacional do Limpopo*, 2005–2010

	2005	2006	2007	2008	2009	2010
External financing						
Donors	81,910,708	81,910,708	286,833,167	286,833,167	n/a	n/a
GoM allocation – Personnel	0	0	0	0	0	0
GoM allocation – Goods & services	0	0	0	0	0	0
GoM allocation – Capital	0	0	0	0	0	0
Own income						
Concession income	0	1,590,899	10,032,697	20,065,394	30,098,091	40,130,789
Entry and activity fees, etc.	1,698,658	1,698,658	1,698,658	1,698,658	1,698,658	1,698,658
Total annual income	**83,609,366**	**85,200,265**	**298,564,521**	**308,597,219**	**31,796,749**	**41,829,446**

Source: Author calculations based on PIU, 2003b; DNAC, n.d.; AFD, 2006.

Table 9 External financing and self-generated income (USD), *Parque Nacional do Limpopo*, 2005–2010

	2005	2006	2007	2008	2009	2010
External financing						
Donors	3,261,700	3,261,700	11,421,697	11,421,697	n/a	n/a
GoM allocation – Personnel	0	0	0	0	0	0
GoM allocation – Goods & services	0	0	0	0	0	0
GoM allocation – Capital	0	0	0	0	0	0
Own income						
Concession income	0	63,400	399,500	799,000	1,198,500	1,598,000
Entry and activity fees, etc.	67,600	67,600	67,600	67,600	67,600	67,600
Total annual income	**3,329,300**	**3,392,700**	**11,888,839**	**12,288,341**	**1,266,100**	**1,665,700**

Source: Author calculations based on PIU, 2003b; DNAC, n.d. ; AFD, 2006.

3.3 Parque Nacional das Quirimbas

The *Parque Nacional das Quirimbas* (PNQ, Quirimbas National Park) was proclaimed in 2002 in response to requests from local communities and other stakeholders, and is thus unique in Mozambique (MITUR, 2004; MITUR, n.d.). The park encompasses an area of approximately 7,506 km^2, of which 5,984 km^2 is terrestrial and 1,522 km^2 is marine or coastal (the latter including the southern-most 11 islands of the Quirimbas Archipelago). The park has a management plan, which identifies several management objectives – to protect, conserve and restore the ecosystem processes and the species and genetic diversity of all resources, including important cultural and historical sites; to promote the economic and social well-being of the park's ancestral inhabitants; to ensure that all stakeholders share both the benefits of and the management responsibility for the park; to stimulate and facilitate eco-tourism, and to ensure the financial sustainability of the park (MITUR, 2004).

Overfishing in the park has been identified as the most serious threat to the PNQ. Less severe threats include the use of destructive fishing gear and practices, pressure on intertidal habitats and mangrove utilisation, the human influence on ability of corals to regenerate after el Niño/Southern Oscillation in 1998/99, the impact of egg hunters on turtle nesting and the damaging effects of trade in protected species (e.g. corals, turtles, shells, etc.). The potential of conflict between fishing and tourism has also been flagged as a potential problem. In terms of the terrestrial environment, the management plan outlines a number of current and potential threats to park resources and integrity, including the potential conflict between animal and human populations for water, indiscriminate cutting of forest and thickets, felling to open new fields, annual bush burning and timber poaching, human–wildlife conflict, subsistence and commercial hunting (MITUR, 2004).

3.3.1 Forecast *Parque Nacional das Quirimbas* Finances

The business plan for PNQ was developed with aim of creating a self-financing mechanism for the PNQ. It provides estimates for three scenarios – worst, medium and best – which show that, even in the worst case scenario (with occupancy rates of only 20 per cent), the park can generate a positive net income over the period under consideration (2004–2017) (Anon, 2003b). For this analysis, the middle scenario (with occupancy rates estimated to rise to 32.5 per cent) was used.

According to the business plan, investment expenditures are allocated to building and/or rehabilitating offices, staff housing, entrance gates, boundary marking, equipment purchase, etc. It would appear that no allocation has been made for the building and/or rehabilitation of infrastructure to improve the conservation management (and potential subsequent tourism development) of the terrestrial part of the park (for instance, the development of a road network). This would seem to be an important oversight in the development of the park (Anon, 2003b). Information regarding actual donor financing and expenditures made were available from WWF for financial years 2005 and 2006, which have been used in the place of business plan estimates for those years.

While the management plan does not explicitly state that the park is to be co-managed with the resident communities, it does discuss the presence of a community representative on the Park Management Committee and the creation of a Community Advisory Council to liaise with the Park Administrator and relevant District Administrators. Funds allocated to community development and institution building would appear to be underestimated with respect to the likely real cost of building capacity and providing technical assistance for such activities (see Tables 10 and 11). The PNQ business plan was the only one of those examined which budgeted explicitly for making payments to the Tourism Fund[2]. It also incorporated explicit payments to the PNQ community development fund into its operating costs[3].

Table 10 Investment and operating expenditures (MZN), *Parque Nacional das Quirimbas*, 2005–2010

	2005	2006	2007	2008	2009	2010
Investment expenditure	**1,383,902**	**6,347,035**	**1,502,155**	**1,487,806**	**12,678,800**	**12,678,800**
Operating costs						
Human resources	4,509,437	10,400,057	6,033,413	6,214,415	4,553,341	4,553,341
Other operating expenditures	3,720,573	8,258,825	13,276,261	13,981,837	3,468,911	3,468,911
MITUR tourism dev. fund	0	0	416,059	527,029	583,887	692,868
Community development fund	0	0	832,119	1,054,058	1,167,773	1,385,737
Sub-total (operating costs)	**8,230,010**	**18,658,882**	**20,558,151**	**21,777,338**	**9,773,912**	**10,100,857**
Total annual expenditure	**9,613,912**	**25,005,917**	**22,060,306**	**23,265,144**	**22,452,712**	**22,779,657**

Source: Author calculations based on Anon, 2003b; DNAC, n.d.; WWF, 2005, 2006a, 2006b.

Table 11 Investment and operating expenditures (USD), *Parque Nacional das Quirimbas*, 2005–2010

	2005	2006	2007	2008	2009	2010
Investment expenditure	**55,107**	**252,739**	**59,800**	**59,200**	**504,900**	**504,900**
Operating costs						
Human resources	179,566	414,130	240,300	247,500	181,300	181,300
Other operating expenditures	148,153	328,886	528,700	556,800	138,100	138,100
MITUR tourism dev. fund	0	0	16,600	21,000	23,300	27,600
Community development fund	0	0	33,100	42,000	46,500	55,200
Sub-total (operating costs)	**327,719**	**742,997**	**818,600**	**867,200**	**389,200**	**402,200**
Total annual expenditure	**382,826**	**995,736**	**878,400**	**926,400**	**894,100**	**907,100**

Source: Author calculations based on Anon, 2003b; DNAC, n.d.; WWF, 2005, 2006a, 2006b.

Income is assumed to be derived from tourism, with entry and activity fees estimated using those prescribed in the Table of Tariffs. The business plan indicates that the park will be able to achieve fairly high income levels relatively quickly, even though it states that the charging of entry fees should be implemented in a phased manner, in areas where active conservation management is taking place. Of this income, approximately 49 per cent is estimated to be derived from concession fees, with 51 per cent from entry and activity fees.

Information regarding donor funding of the park was sourced from WWF (actual income and expenditures for 2005 and 2006) and from the business plan. The five year expenditure forecast of GoM has also been included, though these expenditures indicate that GoM has only budgeted to allocate funds to cover personnel costs. It would seem that the GoM forecasts of personnel expenditure are insufficient to cover the salaries of the 63 wardens that are reported to work in PNQ

[2] The business plan states that the amount set aside in the budget for the tourism development fund is mandated to be 10 per cent of total self financing receipts, and is send to MITUR at national level (Anon, 2003b).

[3] The business plan states that the amount set aside in the budget for the PNQ community development fund is mandated to be 20 per cent of total self financing receipts and can be managed locally. For PNQ purposes the plan, within the first ten years, is to add a surcharge for community development, depending of course on Ministry approval. This will allow funding for community projects, initially subsidised by the PNQ overall development project, to continue at a high level (Anon, 2003b).

until the years of 2009 and 2010. However, there is allowance made in the business plan budget for salaries and 'topping up' of staff, which is assumed to make up the salary deficit.

Table 12 External financing and self-generated income (MZN), *Parque Nacional das Quirimbas*, 2005–2010

	2005	2006	2007	2008	2009	2010
External financing						
Donors			20,812,128	21,684,058	16,240,000	15,080,000
Personnel	4,509,437	10,400,057				
Goods & services	3,720,573	8,258,825				
Capital	1,383,902	6,347,035				
Government of Mozambique						
Personnel	505,090	565,700	633,580	709,610	794,760	890,130
Goods & services	0	0	0	0	0	0
Capital	0	0	0	0	0	0
Own income						
Concession income	n/a	n/a	2,665,000	2,713,000	2,713,000	2,741,999
Entry and activity income	n/a	n/a	1,495,594	2,557,289	3,125,867	4,186,683
Total annual income	**10,119,002**	**25,271,617**	**25,606,301**	**27,663,956**	**22,873,627**	**22,898,813**

Source: Author calculations based on Anon, 2003b; DNAC, n.d.; WWF, 2005, 2006a, 2006b.

Table 13 External financing and self-generated income (USD), *Parque Nacional das Quirimbas*, 2005–2010

	2005	2006	2007	2008	2009	2010
External financing						
Donors			828,700	863,500	646,700	600,500
Personnel	179,600	414,100				
Goods & services	148,200	328,900				
Capital	55,100	252,700				
Government of Mozambique						
Personnel	20,100	22,500	25,200	28,300	31,600	35,400
Goods & services	0	0	0	0	0	0
Capital	0	0	0	0	0	0
Own income						
Concession income	n/a	n/a	106,100	108,000	108,000	109,200
Entry and activity income	n/a	n/a	59,600	101,800	124,500	166,700
Total annual income	**402,939**	**1,018,262**	**1,019,600**	**1,101,600**	**910,800**	**911,800**

Source: Author calculations based on Anon, 2003b; DNAC, n.d.; WWF, 2005, 2006a, 2006b.

3.4 Reserva do Gilé

The Partial Game Reserve of Gilé (*Reserva Partial de Caça do Gilé*) in Zambézia Province was first proclaimed in 1932, and extended in 1960 to its present 2,100 km^2, with a buffer zone of approximately 1,800 km^2. When the forestry and wildlife law came into force in 2000, Gilé become a National Reserve. According to the management plan, the specific purposes of the reserve are the conservation of biodiversity and the restoration of ecosystem processes, the promotion of sustainable exploitation of bio-resources, and the participation in the development and management of the reserve by local communities. The promotion of environmental education has also been identified as a goal of the reserve, as has the facilitation of research and monitoring into local resources, and the appropriate development of ecotourism (Fusari and Cumbane, 2002).

The main threats to the biodiversity of the reserve as identified in the management plan include commercial and subsistence hunting and the over-harvesting of other (plant) resources. Wildfires are also identified as a threat. Commercial timber logging and mining are identified as potentially severe threats to the preservation of the ecosystem if not carefully managed; while they don't take place within the reserve (currently) it is thought that these activities may increase the reliance of the residents on resources within the protected area. Water pollution from mining activities is also a

potential threat. It is also thought that if timber concessions restrict the area available for the expansion of agricultural production, clearing within the reserve could potentially pose a threat to the integrity of the reserve (Fusari and Cumbane, 2002).

3.4.1 Forecast *Reserva do Gilé* Finances

The RG has been included in this analysis as an example of the potential achievements of small reserves with limited funding. Note that very little activity currently occurs within the reserve.

The RG is the only protected area of those examined in this study that does not have a business plan separate from its management plan. However, part of one of the chapters of the management plan deals with the costs associated with a donor funded project (funded by the European Union, through the Italian non government organisation, Movimondo). The plan was developed for expenditure between 2003–2007. However these expenditures have been extended to 2010 for this analysis.

In terms of investment, the plan focuses on the rehabilitation of camps and the opening up of new roads. Compared to the estimates in the other three business plans considered as part of this study, these estimates appear somewhat low, but it may be that the scale of the work is smaller than required in the other parks. In the period under consideration (2005–2010) equipment purchases are limited to means of transport.

Table 14 Investment and operating expenditures (MZN), *Reserva do Gilé*, 2005–2010

	2005	2006	2007	2008	2009	2010
Investment expenditure						
Infrastructure development/rehabilitation	234,502	0	0	0	0	0
Transport and equipment	0	548,193	548,193	548,193	540,595	540,595
Sub-total (investment expenditure)	**234,502**	**548,193**	**548,193**	**548,193**	**540,595**	**540,595**
Operating costs						
Human resources	425,105	354,755	354,755	354,755	389,930	354,755
Other operating expenses	375,203	304,853	820,757	161,025	161,025	161,025
Sub-total (operating costs)	**800,309**	**659,607**	**1,175,512**	**515,779**	**550,955**	**515,779**
Total annual expenditure	**1,034,811**	**1,207,800**	**1,723,705**	**1,063,972**	**1,091,550**	**1,056,375**

Source: Author calculations based on Fusari and Cumbane, 2002; DNAC, n.d.

Table 15 Investment and operating expenditures (USD), *Reserva do Gilé*, 2005–2010

	2005	2006	2007	2008	2009	2010
Investment expenditure						
Infrastructure development/rehabilitation	9,300	0	0	0	0	0
Transport and equipment	0	21,800	21,800	21,800	21,500	21,500
Sub-total (investment expenditure)	**9,300**	21,800	21,800	21,800	21,500	21,500
Operating costs						
Human resources	16,900	14,100	14,100	14,100	15,500	14,100
Other operating expenses	14,900	12,100	32,700	6,400	6,400	6,400
Sub-total (operating costs)	**31,900**	**26,300**	**46,800**	**20,500**	**21,900**	**20,500**
Total annual expenditure	**41,200**	**48,100**	**68,600**	**42,400**	**43,500**	**42,100**

Source: Author calculations based on Fusari and Cumbane, 2002; DNAC, n.d.

In terms of operating expenditures (see Tables 14 and 15), operating costs are considerably lower that those of the three other parks considered; however, only 12 employees are reported to work in the reserve (11 rangers and one administrator), and the reserve is less than half the size of the next smallest protected area considered in this study.

Table 16 External financing and self-generated income (MZN), *Reserva do Gilé*, 2005–2010

	2005	2006	2007	2008	2009	2010
External financing						
Donors	35,175	0	0	0	17,587	0
GoM allocation – Personnel	527,790	591,130	662,060	741,510	830,490	930,150
GoM allocation – Goods & services	540,000	604,800	677,380	758,660	849,700	951,660
GoM allocation – Capital	200,000	224,000	250,880	280,990	314,700	352,470
Own income	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**
Total annual income	**1,302,965**	**1,419,930**	**1,590,320**	**1,781,160**	**2,012,478**	**2,234,280**

Source: Author calculations based on Fusari and Cumbane, 2002; DNAC, n.d.

Table 17 External financing and self-generated income (USD), *Reserva do Gilé*, 2005–2010

	2005	2006	2007	2008	2009	2010
External financing						
Donors	1,400	0	0	0	700	0
GoM allocation – Personnel	21,000	23,500	26,400	29,500	33,100	37,000
GoM allocation – Goods & services	21,500	24,100	27,000	30,200	33,800	37,900
GoM allocation – Capital	8,000	8,300	10,000	11,200	12,500	14,000
Own income	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**
Total annual income	**51,900**	**56,500**	**63,300**	**70,900**	**80,100**	**89,000**

Source: Author calculations based on Fusari and Cumbane, 2002; DNAC, n.d.

Given that no complete business plan has been developed for RG, no estimates are available regarding the potential for income to be generated from activities within the reserve (e.g. from tourism). However, some information on funding from the European Union is available, as are estimates of GoM funding allocations for the 2005–2010 period (see Table 9). Between 2005 and 2010, very little funding is expected to be received from donors (unless more is raised), as the majority of investments made as part of the European Union project were assumed to be complete by 2005. It was expected that over the life of the project, donor funding would provide 57 per cent of required funding, and the GoM (and potentially other donors) would provide the remainder of funds required for the outlined activities. Of the funds allocated by GoM, 42 per cent are earmarked for personnel, 43 per cent for goods and services, and the remaining 16 per cent for capital.

4 FINANCING GAPS

From Tables 18 and 19 it can be seen that according to these estimates, PNB has considerable and constant financing gaps; RG also demonstrates a financial deficit in one year of the six examined. The PNB makes consistent (though decreasing losses) and does not operate profitably, even with both GoM budget allocations and park-generated income from tourism activities. It must be recognised that no income from donor funds has been incorporated, so the real financing gap of this park is likely to be considerably smaller. The park is also said to provide a steady flow of funds and jobs to the community and net economic benefits through linkages to economy from increased tourism to this part of Mozambique (Busico et al., 2003). The combination of conservative income estimates and the possibility of making cost savings mean that, under good management, the park could potentially break even.

PNL is estimated to have a financing gap in four of the six years, with surpluses in the other two. In reality, the deficit shown for 2009 and 2010 is improbably, as the high profile of the park makes it likely that donor funding will be forthcoming in those years. The business plan states that the PNL (using optimistic estimates) should eventually be able to generate sufficient revenue from park entrance fees and concessions to cover its operational costs (PIU, 2003b).

Given that donor funding has been included in the business plan for the PNQ, the park is predicted to make surpluses in the early years of development, though these decrease toward the end of the

estimated time period, as the proportion of donor funding covering investment and operating costs falls.

It would seem that because the investment and operational costs of the RG are moderate, with the estimated budget allocations from GoM, and the small amount of donor financing available that the park can run at a net profit, even before any income from tourism is generated. However, this does mean that the financial position of the reserve is particularly vulnerable to changes in the level of donor funding and government budget allocations.

It can also be seen from Tables 18 and 19 that the total expenditure levels of PNL are extremely high compared to the other parks and reserves – more than double the next most expensive annual expenditure. In contrast, the estimated annual expenditure of RG are extremely small; just 10 per cent of the next lowest annual expenditure.

Table 18 Annual estimated financing gap (MZN), 2005–2010

	2005	2006	2007	2008	2009	2010
Parque Nacional do Banhine						
Total annual expenditure	23,164,387	14,510,816	14,510,816	14,510,816	14,510,816	14,510,816
Total annual income	2,437,631	2,762,160	3,016,178	3,450,610	3,732,371	4,029,837
Financing gap	-20,726,756	-11,748,656	-11,494,638	-11,060,205	-10,778,445	-10,480,979
Parque Nacional do Limpopo						
Total annual expenditure	133,214,473	97,749,116	286,833,167	286,833,167	57,380,537	64,585,797
Total annual income	83,609,366	85,200,265	298,564,521	308,597,219	31,796,749	41,829,446
Financing gap	-49,605,107	-12,548,850	11,731,355	21,764,042	-25,583,787	-22,756,351
Parque Nacional das Quirimbas						
Total annual expenditure	9,613,912	25,005,917	22,060,306	23,265,145	22,452,712	22,779,657
Total annual income	10,119,002	25,571,617	25,606,301	27,663,956	22,873,627	22,898,813
Financing gap	505,090	565,700	3,545,995	4,398,812	420,914	119,156
Reserva do Gilé						
Total annual expenditure	1,034,811	1,207,800	1,723,705	1,063,972	1,091,550	1,056,375
Total annual income	1,302,965	1,419,930	1,590,320	1,781,160	2,012,478	2,234,280
Financing gap	268,155	212,130	-133,385	717,188	920,928	1,177,905

Source: Author calculations based on Fusari & Cumbane, 2002; Busico et al., 2003; PIU, 2003b; Anon, 2003b; DNAC, n.d.; AFD, 2006: WWF, 2005, 2006a, 2006b.

Table 19 Annual estimated financing gap (USD), 2005–2010

	2005	2006	2007	2008	2009	2010
Parque Nacional do Banhine						
Total annual expenditure	922,400	577,800	577,800	577,800	577,800	577,800
Total annual income	97,100	110,000	120,100	137,400	148,600	160,500
Financing gap	-825,300	-467,800	-457,700	-440,400	-429,200	-417,400
Parque Nacional do Limpopo						
Total annual expenditure	5,304,600	3,892,400	11,421,697	11,421,697	2,284,900	2,571,800
Total annual income	3,329,300	3,392,700	11,888,800	12,288,300	1,266,100	1665,600
Financing gap	-1,975,300	-499,700	467,143	866,645	-1,018,700	-906,200
Parque Nacional das Quirimbas						
Total annual expenditure	382,800	995,700	878,400	926,400	894,100	907,100
Total annual income	402,900	1,018,300	1,019,600	1,101,600	910,800	911,800
Financing gap	20,100	22,600	141,200	175,200	16,800	4,700
Reserva do Gilé						
Total annual expenditure	41,200	48,100	68,600	42,400	43,500	42,100
Total annual income	51,900	56,500	63,300	70,900	80,10	89,000
Financing gap	10,700	8,400	-5,300	28,600	36,700	46,900

Source: Author calculations based on Fusari & Cumbane, 2002; Busico et al., 2003; PIU, 2003b; Anon, 2003b; DNAC, n.d.; AFD, 2006: WWF, 2005, 2006a, 2006b.

Tables 20 and 21 demonstrate that across the six year period under consideration, despite the single year of estimated deficit, RG operates at a net surplus, though it is relatively small. PNQ also operates at a net surplus of approximately $US380,500. The extent of the financing gaps of PNB is estimated to be approximately $US3 million. While PNL appears to have a deficit of $US9.6 million, as noted above, this is likely due to incomplete information about the future funding of the park, as well as the shortfall in funds to cover capital investments estimated for 2005 and 2006.

Table 20 Total estimated financing gap (MZN)

	PNB	PNL	PNQ	RG
Total annual expenditure	95,718,466	1,090,417,673	125,177,649	7,178,213
Total annual income	19,428,787	849,597,567	134,733,316	10,341,133
Financing gap	-76,289,679	-240,820,106	9,555,667	3,162,920

Source: Author calculations based on Fusari & Cumbane, 2002; Busico et al., 2003; PIU, 2003b; Anon, 2003b; DNAC, n.d.; AFD, 2006: WWF, 2005, 2006a, 2006b.

Table 21 Total estimated financing gap (USD)

	PNB	PNL	PNQ	RG
Total annual expenditure	3,811,500	43,420,400	4,984,600	285,800
Total annual income	773,700	33,831,000	5,365,100	411,800
Financing gap	-3,037,800	-9,589,400	380,500	126,000

Source: Author calculations based on Fusari & Cumbane, 2002; Busico et al., 2003; PIU, 2003b; Anon, 2003b; DNAC, n.d.; AFD, 2006: WWF, 2005, 2006a, 2006b.

Tables 22 and 23 shows the average (across the 2005–2010 period) expenditure and income per square kilometre of each protected area. Not only does RG have a small budget compared with the other protected areas, its cost/km^2 are also considerably smaller than any others. This is contrary to conventional wisdom which typically assumes economies of scale for larger areas. In contrast to the other protected areas, it has significantly higher allocations from GoM for all three categories (for personnel, goods and services and capital). Though the net surplus of RG is estimated to be only 20 per cent of that of PNQ, when calculated per square kilometre, they are extremely similar.

With the high investment expenditure for PNL a high downstream operating expenditure would be expected, as would a higher income (assuming some investment improves revenue generation), which is the case. However it is recognised that this figure does not assess past investment for any of the areas (complete information regarding prior investments was not available for any of the parks). This is critically important information as it provides a good basis for determining the maintenance which may be required (especially for conservation related infrastructure) and/or the revenue generating ability (if the investments have income generating potential, such as those in tourism infrastructure, wildlife assets, etc.).

Table 22 Average estimated financing allocation (income and expenses) per km^2 (MZN)

	PNB	PNL	PNQ	RG
Investment expenditure	**352**	**3,717**	**801**	**235**
Operating costs				
Human resources	1,450	1,532	805	177
Other operating costs	477	632	1,025	157
MITUR Fund for Tourism Development	0	0	49	0
Community development fund (PNQ)	0	0	99	0
Sub-total (operating costs)	**1,927**	**2,165**	**1,978**	**335**
Unallocated expenditure	n/a	**12,291**	n/a	n/a
Total annual expenditure	**2,279**	**18,174**	**2,779**	**570**
External financing				
Donors	n/a	12,291	2,408	4
GoM allocation – Personnel	122	0	91	340
GoM allocation – Goods and services	88	0	0	348
GoM allocation – Capital	0	0	0	129
Own income				
Concession income	127	1,699	241	n/a
Entry and activity fees	18	170	252	n/a
Hunting and live game sales	107	0	0	n/a
Total annual income	**463**	**14,160**	**2,992**	**821**
Financing gap	**-1,816**	**-4,014**	**212**	**251**

Source: Author calculations based on Fusari & Cumbane, 2002; Busico et al., 2003; PIU, 2003b; Anon, 2003b; DNAC, n.d.; AFD, 2006: WWF, 2005, 2006a, 2006b.

Table 23 Average estimated financing allocation (income and expenses) per km^2 (USD)

	PNB	PNL	PNQ	RG
Investment expenditure	**14**	**148**	**32**	**9**
Operating costs				
Human resources	58	61	32	7
Other operating costs	19	25	41	6
MITUR Fund for Tourism Development	0		2	0
Community development fund (PNQ)	0		4	0
Sub-total (operating costs)	**77**	**86**	**79**	**13**
Unallocated expenditure	n/a	**489**	n/a	n/a
Total annual expenditure	**91**	**724**	**111**	**23**
External financing				
Donors	n/a	489	96	0
GoM allocation – Personnel	5	0	4	14
GoM allocation – Goods and services	4	0	0	14
GoM allocation – Capital	0	0	0	5
Own income				
Concession income	5	68	10	n/a
Entry and activity fees	1	7	10	n/a
Hunting and live game sales	4	0	0	n/a
Total annual income	**18**	**564**	**119**	**33**
Financing gap	**-72**	**-160**	**8**	**10**

Source: Author calculations based on Fusari & Cumbane, 2002; Busico et al., 2003; PIU, 2003b; Anon, 2003b; DNAC, n.d.; AFD, 2006: WWF, 2005, 2006a, 2006b.

Table 24 presents a number of key expenditure and income ratios that can be used to assess the potential viability and efficiency of the park. These are important indicators which can help highlight areas which may require further investigation. There are no absolute standards but as with many accounting ratios they are valuable tools.

In both PNB and PNL, the high proportions of human resource costs to operating costs suggest resources allocated to other operating costs (e.g. supplies, transport, communications, etc.) may be too low, and this may hamper staffs' ability to properly carry out their functions. (While there may be a logical explanation for these results, closer scrutiny of the data was not possible with the information provided.) This ratio is much more acceptable for both PNQ and RG, and would be likely to enable staff in both protected areas to carry out their duties efficiently and effectively.

For PNL, PNQ and RG, the ratios of income sources indicate a high degree of vulnerability to changes in allocations from one source or another. This is particularly challenging when a high proportion of income is donor funding (as in the case of PNL and PNQ), as these funds are generally only allocated over the short to medium term. If donor funds are used for capital investment, then the vulnerability of the protected area may be lessened, provided the investment does not attract high or excessive ongoing expenditure (particularly for maintenance). Such investments may improve income generating ability (e.g. tourism-related assets that have been the subject of rigorous business feasibility analyses), or improve operational efficiency (e.g. improved technology or infrastructure). PNL relies heavily on donor income – though being a part of the Great Limpopo Transfrontier Park may ensure that this source of funding is not cut dramatically prior to the park approaching net operating surpluses, as there is a great deal of political will behind the concept. This may not hold true for PNQ, and it is important that where donor funding supports annual operations, then a medium to long term plan by the GoM to bridge this (future) shortfall will be required. RG appears to be heavily reliant on GoM allocations to support its operation. However, this is likely to be partly the result of a lack of information regarding the ability of the reserve to generate income from tourism activities within the park. It would seem sensible for the reserve to attempt to reduce its reliance on GoM allocations, particularly in the light of the high allocations per square kilometre, compared to the other protected areas (sees also Tables 22 and 23). With data regarding donor funding for PNB, it is difficult to determine how vulnerable the park is to changes in funding levels. The comparatively high reliance on own income would appear to indicate a path to financial sustainability; but until actual income and expenditures can be analysed it is not possible to know whether this reflects the real financial situation of the park. Further, it must also be noted, that with the exception of PNL, own-generated income does not at present automatically return to the park to be used to cover operating expenditures.

Table 24 Key expenditure and income ratios, all protected areas (%), 2005–2010

	PNB	**PNL***	**PNQ**	**RG**
Proportion of operating costs				
Human resources	75	71	40	53
Other operating costs	25	29	51	47
MITUR Fund for Tourism Development	0	0	3	0
Community development fund (PNQ)	0	0	7	0
Proportion of total annual income				
Donors	n/a	87	80	1
GoM allocations	45	0	3	99
Own income	55	13	17	n/a
Proportion of income to expenditure	**20**	**189**	**108**	**144**

* excluding unallocated expenditure
Source: Author calculations.

Estimates for PNB suggest that in the absence of donor funding, the park will be able to generate just 20 per cent of projected expenditures in the period 2005–2010, resulting in a financing gap of MZN76 million over the five year period. In comparison, the surpluses generated by both PNQ and RG are modest, but important in the context of a financially viable protected area network.

5 DISCUSSION AND RECOMMENDATIONS

The analysis presented above shows the varying financial fortunes of these four protected areas on Mozambique, with two protected areas estimated to operate at a net deficit and two to operate at a net surplus between 2005 and 2010. It is very difficult for a desktop study of this nature to provide meaningful insights into the financial sustainability of a protected area network without more, and more detailed, information regarding the actual incomes and expenditures over the short to medium term for the network as a whole. Business plans anticipate that some of parks and reserves will reach a point where they can cover their operational costs, but their achievement of this will depend heavily on the mandate provided through policies and legislation. However, the objective of each park and reserve having to cover its own costs is not necessarily sound – it may result in parks and/or reserves being 'overdeveloped' and possibly compromising biodiversity, or capturing benefits which may be better captured by local communities or businesses. There are very few conservation agencies which can deliver on this goal – as noted above, even SANParks which has enormous revenue generating potential and a huge tourism asset base to build off, struggles to meet the financial needs of the institution.

The chief limitation of this study related to the paucity of real financial information for the protected area network in Mozambique, which is one of the most significant shortcomings in the existing system of protected area management in Mozambique. Although all of the protected areas examined as part of this study have management and/or business plans, the lack of sufficient real data regarding actual expenditures, incomes and staffing levels of protected areas in Mozambique means there is no way of determining whether a link between the plans and budgets outlined and actual work programmes in the parks/reserves exists. Rectifying this situation is absolutely vital, and it is the principal recommendation of this report that systems are designed and implemented so that financial information of the sort required by a study such as this is easily accessible, and actively used in management decisions. The implementation of a sound financial management system covering government and donor funds should be the first step toward a sustainably financed system of protected areas. It will not be possible to plan ahead for a sustainably financed network if the planners do not know where they are starting from.

The existence of park management and business plans for the protected areas studied for this report is an encouraging sign. As part of a sound financial management system, it should be from these plans that activities are identified, prioritised and scheduled (preferably by the park manaer), forming a workplan from which a budget can be developed and costs estimated. Park managers require the ability to adapt these budgets to the reality on the ground in response to financial constraints, constantly reviewing and adapting them, as all these management processes are highly dynamic. Thus activities within management and business plans should be prioritised during the development stage, so they can be undertaken as funding becomes available (or be used to raise donor funds for discrete activities to be undertaken within the protected area). In Mozambique, it would seem that planning skills appear to be in order (or can be relatively easily accessed), but monitoring and other business management skills appear to need upgrading.

Managers also require the necessary authority to make expenditures, with reasonable flexibility to spend and reallocate funds according to local need (according to sound and reasonable financial management controls and procedures). This typically requires an institution with a degree of decentralisation in decision making. Very few conservation authorities (especially government departments) allow the necessary level of decentralisation, constrained as they are by bureaucracy – often necessary for government, but not always appropriate for conservation institutions. If provincial administrations are to assume responsibility for budgeting post-2006, this may be a step in the right direction, providing regular monitoring is undertaken which targets performance (rather than other issues which often take precedence and bear little relationship to work efficiency). However, typically government structures and systems tend towards compliance and adherence to procedure rather than efficiency, and rarely cultivate the requisite business management skills. However, the recruitment

and retention of mangers with appropriate skills is key, as is the provision of a working environment in which they area able to flourish, and receive mentoring and training. The case for a special entity or institution, regulated by government, but with opportunity to encourage efficient management may need to be explored in order to achieve sound financial management.

There is a need for accounting systems within protected area management institutions to create cost centres which relate to management activities. This is particularly true for tourism related activities. The tourism and conservation goals and objectives of a park must be clearly articulated. If the role of tourism is to generate income, then it must be operated as a separate business unit. (This does not necessarily mean that it must be run as a separate entity, but rather as a cost centre within the accounting system.) Targets should be set, and monitored to ensure that they are met within defined budgets. Tourism, especially in emerging protected areas can very easily consume large portions (if not all) of park budgets and, rather than contributing to biodiversity conservation, can detract from it. This can only be measured by clearly defining the role of tourism within a park and then measuring its contribution to this goal. This does not appear to be the case at the sites analysed for this report. Also at a network level, there is a need to analyse the costs and revenue streams that occur above the park level (i.e. regional and head office) to determine the total financial needs of the network. Typically, these levels of administration of management create significant additional costs for the network, and small (if any) revenue streams.

It is desirable for park management authorities to raise and retain their own funding, and is common to many conservation authorities across Africa and around the world. This is already the case with Mozambique's Tourism Fund, although it centralises management of tourism revenues.

A unique agreement for the PNL has been made, which enables the park to keep the revenues generated within its borders to be used to offset operating and investment costs. This has significant implications for the financial viability of the national protected area network. As noted in Martin (2004) and DS&I (2004), in both South Africa and Zambia, the bulk of national revenue generated are done so in a very small number of protected areas. In South Africa, three national parks generated virtually the entire net surplus across a network of 21 national parks, in Zambia four national parks (out of 19) generated 90 per cent of income for ZAWA. It is common for a national protected area network to have a small number of parks with a high number of visitors, and thus relatively high own-generated income (or high tourism potential), and a larger number of financially marginal and/or non-viable parks. In order to ensure the effective management of the national network, cross-subsidisation between the parks tends to occur. In a case where the park(s) with the highest tourism potential are (financially) removed from the network, it is unlikely that the network would be able to sustain itself; which may eventually lead to the network being viewed by central government as a drain on resources rather than an asset. This view is likely to be exacerbated when regional and central costs of the managing institution (e.g. DNAC) are taken into account, as they further increase the costs associated with managing protected areas without increasing revenue.

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