An Economic Analysis of Natural Resources Sustainability in Mozambique

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Foreword

Executive Summary

I. Introduction

II. Basic Economics of Natural Resources in Mozambique

Summary Overview
Land
Water
Fisheries
Forestry
Mining

III. Natural Resources Management Policies, Implementation and Governance

Summary Overview
Land
Water
Fisheries
Forestry
Mining

IV. Making Better Use of its Natural Resources Potential

Overall Policies
Sector Recommendations

ANEXES – Sector Background Papers

Rural Land Issues and Policies in Mozambique
An Economic Analysis of Natural Resources Sustainability in Mozambique Water Sector
An Economic Analysis of Natural Resources Sustainability in Mozambique Fisheries
An Economic Evaluation of Forestry Regulation in Mozambique
A Summary Analysis of the Mining Sector in Mozambique

FOREWORD

This report was prepared as an input to Mozambique's Country Economic Memorandum – CEM. An exploratory mission to Maputo took place in December of 2003, and the overall ideas were discussed with the government. After the mission, the team prepared Terms of Reference for the Natural Resources Chapter, which were shared with the government and which culminate with the present study. The main mission took place in April of 2004.

The report summarizes the findings of five background papers focusing on each of the five sectors analyzed – land, water, fisheries, forestry and mining. Their selection, also discussed with the government, was based on their importance in terms of the potential for both economic growth and poverty reduction, as well as because they share major theoretical properties in terms of their economic use, so that many common principles apply to policy design. These reports are presented as Annexes to the present report.

The team is immensely thankful to the numerous government officials and non-government professionals who dedicated valuable time resources to share information and discuss ideas which are the basis of the reports. While the team remains entirely responsible for any opinions expressed in the document, it recognizes that the basic knowledge and ideas really originate from this local expertise. The team's intention is simply to contribute to the debate, bring in international experience, attempt to bring together analyses of the five themes, and also to give an economic focus.

The team also wants to acknowledge the fact that in the very short period of time since the conflicts in the country have ended, Mozambique has made a very impressive progress in putting in place natural resources management systems. The team is also aware of the immense difficulties in passing on legislation and setting up institutional structures with qualified personnel. This is what ultimately matters. Yet, as just mentioned, our idea is to contribute to the debate providing ideas based on international experience and analyses of local information.

Finally, it is important to note that in order to help tailor our findings to the realities of Mozambique and also to ensure that they are consistent with the current debate, four of the five background documents and the present report were critically reviewed by four very senior Mozambican experts in natural resources issues[1]. While they are also in no way responsible for the opinions expressed here, they were extraordinarily helpful in bringing the team closer to the tougher realities of Mozambique. In addition, a small mission returned to Mozambique in February 2005 to discuss at a more technical level the main findings of the reports. The final report incorporates the various comments received, and the mission is once more thankful for the time, dedication and the substantive contributions provided by Mozambican counterparts.

[1] Messrs. José Negrão (land), Alvaro Carmo Vaz (water), Tenreiro de Almeida (fisheries), and Almeida Sitoe (forestry).

EXECUTIVE SUMMARY

1. Mozambique is a large country, thinly populated, with large areas of unutilized land, with the ratio of cultivated land to cultivable land of only 12%. Its water availability per capita is close to Africa's and the world's averages. While ample for present needs, water resources are not so abundant that they can be used casually or inefficiently. The country is particularly rich in fish resources, and the potential is already being largely exploited both in commercial terms as well as in terms of serving as an economic buffer in poorer coastal areas. A similar situation occurs in the mining sector, although the level of exploitation is way below the country's potential. The country's forestry potential has certainly been under-utilized, although there is significant waste with current unsustainable practices.

2. With a population which is nearly 75% rural, the country's economy will undoubtedly continue to rely to a very large extent on its natural resource base. Even with rapid rates of urbanization, the subsistence and well being of most Mozambicans will continue to depend on their access to land, water resources, forest products, fisheries, mines, and other natural resources. Further, since raising agricultural productivity must be one of the key pillars for sustaining economic growth and poverty reduction, the development of commercial agricultural will put more pressure, although in a more efficient manner, on natural resources.

3. The government of Mozambique must balance its immediate goal of reducing poverty through more labor-intensive uses of natural resources with longer term strategies to promote the investment of more capital in agriculture and natural resource activities so as to improve efficiency and the value-added per unit of resources. Better management of resources can reduce but not always eliminate the potential trade-offs between efficiency and equity. Limited domestic funds for investment in resource-based activities, leading to heavy reliance on foreign capital, can pose difficult choices.

4. As the numbers above have suggested, and the report explores in much greater detail, the country starts from a more favorable position than many others. At the current levels of resource utilization, combining high levels of economic growth with poverty reduction need not involve major conflicts over natural resources at the national level, except perhaps in the case of water. However, there are more difficult issues to be resolved in specific regions and circumstances. It is also essential to make some key choices now, before policies are pre-empted by developments on the ground, about the long term framework for resource development. There is, for instance, abundant land that can be allocated for both subsistence and commercial agriculture. But, the rules and incentives to promote each in specific regions have to be clearly spelled out, so as to ensure that the land is put to efficient uses and to help the poorer peasants. Without such steps, a substantial proportion of the country's resources will continue to be poorly managed.

5. The Government of Mozambique is aware of these problems and has made substantial progress in the management of natural resources during the post-conflict period. Peace and macroeconomic stability have provided a platform for increasing the utilization of its natural resources, contributing to economic growth and poverty reduction. Framework laws that establish the basic ground rules for the use of resources have been enacted. These have been explicitly designed to protect the interests of the poorer Mozambicans, an accomplishment that the entire country should be proud of.

6. Nevertheless, natural resources management policies in Mozambique suffer from one fundamental general problem. The laws rely on the use of instruments for the management of natural resources which have proven successful in most OECD countries as well as in many developing countries. This includes long land leases, water basin committees, delegated management of drinking water supply, quotas, concessions and fees in fisheries, forestry and mining. Yet, too much attention has been given to ensuring an equitable access to resources with much less attention given to the specific mechanisms for ensuring access, for promoting an efficient use of resources, and also for monitoring and enforcing compliance with the norms. Between the Constitution, the laws, regulations, and final implementation and enforcement there is a myriad of factors leading to quite poor outcomes.

7. An effective system for managing natural resources can not be developed in a matter of 5-10 years. Many of the laws are very recent and require time to be adequately "absorbed" and implemented, especially if a genuine attempt is made to ensure the participation of a wide range of stakeholders. Implementing new and complicated institutional arrangements is difficult in terms of the required human and financial resources, and depends on complex cultural factors. In this respect, there is a sense in which the best is the enemy of the good: resources may be better allocated to implement modest but feasible improvements, as opposed to more ambitious and complex structures which succeed in countries with a much longer history of institutional development.

8. As an illustration, the National Water Policy is designed to implement a system of river basin management following the model developed in Western Europe and now adopted in Brazil and many other countries. However, in all countries river basin agencies have required decades to develop into effective institutions that are really capable of discharging the responsibilities given to the ARAs in Mozambique. In the meantime, the only agency that is really operational – ARA Sul – is still struggling to have the resources and capacity to monitor and charge properly for bulk water, or to define and implement priority schemes to rehabilitate or expand irrigation infrastructure.

9. In many cases, the regulations appear to have been "captured" by government bureaucracies which have created unnecessarily complex procedures that may deviate, in implementation, from the original intentions of the framework laws. Major opportunities for rent seeking and corruption have been created, harming both private commercial interests and the poor. The question is whether this has been an unintentional process, fundamentally a consequence of weak institutional capacity, or whether it reflects the presence of vested interests which are capable of directly influencing the bureaucracy.

10. In more economic terms, while the framework laws are clearly designed to protect the poor, and this is a laudable achievement since poverty is the key issue in Mozambique, open access to natural resources cannot be the solution. The next challenge is to implement an effective regime of secure and transparent property rights, which must respect the interests of traditional users but permits – and encourages – the more intensive development of resources. Such development will require the combination of natural resources with substantial capital investment, much of which will have to take the form of foreign investment. Hence, property rights must be seen as being secure for both local populations and foreign investors.

11. The Government of Mozambique will have to make some hard choices. Open access regimes and small scale shifting agriculture have not provided the basis for continued economic growth in any country in the world, and Mozambique is not likely to become an exception to this rule. Equally, there is a

significant risk that rights over natural resources will become increasingly concentrated in the hands of a privileged few – perhaps consisting of joint ventures between the government and/or powerful national interests with foreign investors. Such concentration is likely to favor extensive modes of resource exploitation with low productivity and little aggregate value to benefit the country as a whole. What is required is a middle way under which effective property rights are combined with capital investment in more intensive management of natural resources that generates employment, value added and spill-over benefits for the poor and traditional resource users.

12. This dilemma is not exclusive to Mozambique. The government is very aware of the importance of market activities for the economy and that property rights are critical. While the ultimate ownership of resources will remain vested in the State, secure property rights can take the form of tradable user rights subject to very stable and transparent policies and regulations. This requires political determination and quite small amounts of public money to implement.

13. Major efficiency and equity gains could be achieved in the management of the five resources by implementing better mechanisms for charging for both services and access to resources. At present, the government is foregoing significant rents for access to and the use of resources without achieving any clear benefits in return. Subject to the inevitable uncertainty about such estimates, public revenues from natural resource rents could be increased from US$ 31 million to US$ 82 million per year under current economic conditions, mostly by adopting a reasonable level of rents/charges for land and bulk water. Looking ahead over the next decade, if the policies recommended in this study were adopted, public revenues from natural resource rents in 2015 could realistically increase to US$ 255 million per year, representing almost 3% of GDP or 20% of total tax revenues. The majority of the increase after 2005 will come from the mining sector, where investments are already expanding very significantly, so that the total contribution from this sector alone would almost equal that of the other four natural resources combined.

14. Efficiency and equity gains would be reinforced by clarifying many regulations that create uncertainty, introducing a higher degree of transparency in the system, and improving the capacity to monitor licenses. Finally it is essential to minimize the numerous opportunities for rent seeking and corruption which seriously undermine more efficient and equitable use of natural resources.

15. Among the sectors examined in the study, the water sector is undoubtedly the one that requires most attention and resources. Considerable effort has been devoted to developing the elements of an improved system of governance and management of water resources. However, Mozambique has little prospect of either meeting the MDGs for water supply or poverty alleviation without a much higher level of spending on rural water supply, drought mitigation and smallholder irrigation – either via joint schemes or specific projects. A major barrier to such investments is the high costs exacerbated by the poor record of operational maintenance. Putting in place reliable sources of funding combined with institutional changes to promote competition and greater efficiency in the provision of rural water infrastructure will be critical elements of any policy strategy. The donor community will need in this respect to be less reticent to support investments in water management. And establishing a clear set of priorities and focusing resources will be crucial if policies and expenditures are to have any significant effect.

I. INTRODUCTION

Mozambique is richly endowed with natural resources. Out of a total land area of 780,000 km^2, 620,000 km^2 are covered by some vegetation, with 87,000 km^2 in protected areas. The country is thinly populated with large areas of unutilized land. It has thirty six million hectares of cultivable land spread over 10 different agro-ecological zones; one tenth of this area is suitable for irrigation. Only 12% of cultivable land is currently used for crop production. The country has over 5,500 plant species, 220 mammals, 690 birds, many of which are endemic. Its water availability per capita is close to Africa's and the world's averages. While ample for present needs, water resources are not so abundant that they can be used casually or inefficiently. The country is particularly rich in fish resources, and the potential is already being largely exploited both in commercial terms as well as in terms of serving as an economic buffer in poorer coastal areas. The country's forestry potential has certainly been under-utilized, although there is significant waste with current unsustainable practices. The significant mineral resources have been serving as an economic buffer for many poor rural Mozambicans, and a realistic growth scenario could put long term export revenues at US$ 500 million by 2010.

With a population which is nearly 75% rural, the country's economy will undoubtedly continue to rely to a very large extent on its natural resource base. Even with rapid rates of urbanization, the subsistence and well being of most Mozambicans will continue to depend on their access to land, water resources, forest products, fisheries, mines, and other natural resources. Further, since raising agricultural productivity must be one of the key pillars for sustaining economic growth and poverty alleviation, the development of commercial agricultural will put more pressure, although in a more efficient manner, on natural resources.

The government of Mozambique must balance its immediate goal of reducing poverty through more labor-intensive uses of natural resources with longer term strategies to promote the investment of more capital in agriculture and natural resource activities so as to improve efficiency and the value-added per unit of resources. Better management of resources can reduce but not always eliminate the potential trade-offs between efficiency and equity. Limited domestic funds for investment in resource-based activities, leading to heavy reliance on foreign capital, can pose difficult choices.

As the numbers above have suggested, and the report explores in much greater detail, the country starts from a more favorable position than many others. At the current levels of resource utilization, combining high levels of economic growth with poverty alleviation need not involve major conflicts over natural resources at the national level, except perhaps in the case of water. However, there are more difficult issues to be resolved in specific regions and circumstances. It is also essential to make some key choices now, before policies are pre-empted by developments on the ground, about the long term framework for resource development. There is, for instance, abundant land that can be allocated for both subsistence and commercial agriculture. But, the rules and incentives to promote each in specific regions have to be clearly spelled out, so as to

ensure that the land is put to efficient uses and to help the poorer peasants. Without such steps, a substantial proportion of the country's resources will continue to be poorly managed.

The Government of Mozambique is aware of these problems and has made substantial progress in the management of natural resources during the post-conflict period. Peace and macroeconomic stability have provided a platform for increasing the utilization of its natural resources, contributing to economic growth and poverty alleviation. Framework laws that establish the basic ground rules for the use of resources have been enacted. These have been explicitly designed to protect the interests of the poorer Mozambicans, an accomplishment that the entire country should be proud of.

However, Rome was not built in one day. An effective system for managing natural resources can also not be developed in a matter of 5-10 years. Many of the laws are very recent and require time to be adequately "absorbed" and implemented, especially if a genuine attempt is made to ensure the participation of a wide range of stakeholders. Implementing new and complicated institutional arrangements is difficult in terms of the required human and financial resources, and depends on complex cultural factors. In this respect, there is a sense in which the best is the enemy of the good: resources may be better allocated to implement modest but feasible improvements than to create more ambitious and complex structures which succeed in countries with a much longer history of institutional development.

The study's main motivation lies in the obvious importance of natural resources in terms of their potential for both economic growth as well as poverty alleviation. It is also based on signs that initial progress in improving the system of natural resources management in the 1990s has stalled as a result of slow progress in converting framework legislation into reality on the ground. Among some of these indications are that (i) the system needs a major "competitive shock", so that a more efficient and equitable access to and use of resources can be achieved, (ii) there are major gaps between the framework laws and regulations and their actual implementation, with the result that the poor are more often hurt, even though the laws are largely written to protect them, and (iii) there are numerous opportunities for rent-seeking and corruption which have been undermining a more efficient implementation of the system.

Each natural resource has unique features in terms of abundance, regeneration, access, potential uses and government policies have evolved along different paths. The current key issue in water resources management is lack of the infrastructure required to provide access to the resource. For land, forestry and fisheries the main problem is one of enforcement of property rights. Significant amounts of land, forests and few fish species are underutilized or under-exploited, while major fish species and many aquifers are nearly exhausted or unsuited for consumption. In the mining sector a key challenge is how to bring the small scale activities into formality.

Nonetheless, there is a set of common themes that emerge form examining the situation of each sector. In large part these themes are linked to the capacity and willingness of the bureaucracy and the political system to deliver the effective implementation of perhaps over-ambitious

regulatory and management structures. The goals of recent institutional and legislative reforms are mostly admirable, but their delivery may still fall short of what may have been expected. That gap has created incentives for rent-seeking and disincentives for the more efficient utilization of resources. As a result, policy-makers need to consider how far attempts to emulate best practice in other countries have distracted attention from achieving smaller but effective measures to improve the existing arrangements.

A substantial number of studies and reports on individual natural resources – particularly on land, forestry, fisheries and to a lesser extent on water – have been produced in Mozambique. Nonetheless, major knowledge gaps remain on the economics and the political economy of their use. Studies on natural resources management (NRM) that set out to provide a common framework and looking for common problems are also missing, despite there being a particular Ministry in charge of overall sustainability of natural resources use.

Objectives of the study and Structure

The study provides an economic analysis of some of the key issues in NRM in Mozambique, giving particular emphasis to the regulatory and policy frameworks, impacts on poverty, and governance issues related to the management of resources. It focuses on five major resources – land, water, fisheries, forests and mining. They were selected because of their fundamental role in Mozambique's economy and prospects for poverty alleviation, as well as because they share major theoretical properties in terms of their economic use, so that many common principles apply to policy design.

Given the enormous range of issues involved, the study is very selective and attempts to look at common issues and problems involved in the management of those resources. Specifically, it focuses on two broad sets of issues: (i) basic economics of the sectors, including growth potential and poverty links, as well as forgone incomes associated with current policies and strategies; and (ii) regulatory and incentive gaps and failures, and governance issues, i.e., the practical implementation of policies and the government's political commitment to promote sustainable resource use. The study is divided in three chapters, the first two addressing each of these two sets of issues, and a concluding chapter which summarizes key policy recommendations.

II. BASIC ECONOMICS OF NATURAL RESOURCES IN MOZAMBIQUE

SUMMARY OVERVIEW

In the previous chapter it was briefly indicated that relative to other African countries, Mozambique has a wealth of natural resources that can serve as a platform for economic growth and poverty alleviation. The country has extensive under-utilized land, forest and mineral resources, and fisheries are already being exploited close to optimal levels, even if the government is not adequately capturing rents. In all cases, the poor have benefited from intentionally free or nearly free-access regimes, which have been serving as economic buffers. In the case of water, where access to the resource typically demands more significant investments, potential tensions may arise among competing uses. The study argues more specifically that:

- In terms of access to land, it should be possible to cater for prospective increases in rural population, to provide land for a rapid expansion of medium and large scale commercial farming over the next 10-15 years, as well as to resolve conflicts over land by a process of separating competing uses or users;
- Water availability should not be a limiting factor in the aggregate in the expansion of irrigation, let alone to supply water to urban and rural populations;
- fisheries have represented around 35 - 40% of the total Mozambican export value, while artisanal and subsistence fisheries remain intentionally open access, making the fisheries critically important for food supply in large regions of the country, where fish products account for more than 20% of the animal protein supply;
- national total wood output is only around 127,000 m^3/year today, with the most conservative estimates of the forest potential around 500,000 m^3/year of sustainable logging, perhaps even double this figure; and
- the contribution of the mining sector to the economy is currently less than 2% of GDP, but with the recent significant increases in exploration expenditures, potential long term export revenues could reach as much as US$ 700 million by 2015. Recent household surveys also indicate that poverty rates are much lower among households where the head's primary occupation is mining than the national average.

The framework laws and regulations of each of the five sub-sectors are very protective of the poorer Mozambicans, ensuring them a legal right to freely access the main resources. In the case of land, fisheries, forests, and mining regulations focus primarily on larger scale, commercially oriented private interests, while poorer populations benefit from simplified procedures to access resources, or simply have complete open access. The problem is therefore not the access to these resources but the incentives to make optimum and efficient use. Although the policy and regulatory issues are discussed in the next chapter, the economic implications of their potential gaps and failures are very significant, particularly in the case of land. The government may be

abdicating significant revenues with unclear benefits, while not inducing an efficient use of resources.

The FAO estimates that about 36 million ha of land are cultivable, but the area cultivated for arable and permanent crops was estimated to be only 4.9 million ha in 2003. The total land used for cropping and mixed farming systems should remain at less than 40% up to 2020. An unknown but significant amount of land is leased to (large) private firms and individuals with no utilization and thus without generating either incomes or employment, while rents are essentially not charged for.

In terms of fisheries, the industry is entirely dominated by the Sofala Bank industrial shrimp fishery, and there are no real opportunities for other fisheries to match its profitability and scale in the near future – rent is estimated at US$ 10-30 million annually, exports at US$ 70 million annually, and license fees at US$ 5 million. Artisanal and subsistence fisheries are also of crucial importance in terms of economic buffer and employment opportunities.

Forests in Mozambique occupy an area of about 20 million hectares or 20% of the national territory, with a potential to produce a lowest bound of 500,000 m^3/year of sustainable logging. They are, however, a low-increment forestland with low density of commercial species. National total wood output is only around 127,000 m^3/year today, with wood exports generating a value of US$ 30 million annually. Fee revenues have increased five times recently to US$ 2.26 million in 2003, accounting for only 0.4% of total government revenues.

The mining sector is still mostly composed of small scale and manual operations, the great majority being illegal. The sector's formal contribution to the economy is currently less than 2% of GDP but may formally or informally employ some 50,000 people nationally, or 100,000 if seasonal workers and farmers were included. Fiscal revenues are estimated to be about US$ 3-5 million annually. It is estimated that about US$ 10 million of gold and US$ 30 million of semi-precious stones are exported through informal channels each year, which represent some US$ 1 million in forgone fiscal revenues at current royalty levels.

Unlike the other 3 resources, in the case of water the problem is that access to resources typically requires significant investments in infrastructure, so that even if the resource *per se* were free of charge, as it basically is, the poorer Mozambicans would still have limited access to both clean drinking water and water for irrigation. The key bottleneck is the competition for infrastructure investment, and not a limited availability of water resources *per se*, except in localized cases.

The financial returns to investment in irrigation schemes in large-scale commercial farms are significant, but investors will only be attracted if they have secure property rights over the land and irrigation infrastructure. It is politically easier and socially more fair to justify public investment in smallholder irrigation, which could realistically benefit some 13,500 households per year.

In terms of access to drinking water, estimates of the population served by a safe and reliable water source vary because of differences in definitions and assumption about the number of people served by different types of sources – the background paper provides more details. Even so, the most recent information provided by DNA and FIPAG shows that the rural (poor) represent some 70% of the total population not served. The annual investment required to achieve 90% access to piped water in the 21 major urban centers in Mozambique within 10 years is around US$ 20 million. For rural populations, if the average cost of drilling in the country could be reduced to no more than 50% higher than the level in South Africa, the investment required to meet the MDG of halving the proportion of people without access to clean water would be about US$ 140 million over 10 years.

As the downstream riparian of a number of major rivers with high variability of water flows and limited infrastructure for water management, the country is very vulnerable to events outside its control, as illustrated by the floods in 2000. This vulnerability is exacerbated by the low efficiency and poor state of maintenance of existing infrastructure. In addition, many of the rural population have no access to water for their basic needs and are exposed to severe risks as a result of local droughts.

LAND

The total land area of Mozambique, excluding rivers and inland waters, is about 784,000 km^2. The FAO estimates that about 360,000 km^2 (36 million ha) are cultivable, but the area cultivated for arable and permanent crops was estimated to be only 4.9 million ha in 2003. A detailed assessment of land cover carried out in 1995 by the FAO reported that only 1 million ha were under permanent cultivation, and 19 million ha were used for shifting cultivation. Areas of open and wooded grassland and shrub account for 21.5 million ha – Table 1.

Over 90% of the 4.9 million hectares of cultivated land in 2003 were devoted to food crops. The total area cultivated for food crops increased by only 0.9% per year from 1997-98 to 2003-04. Yet the pressure on cultivable land is relatively low. For the whole country, the ratio of cultivated land to cultivable land is only 12%, although varying from 72% in Gaza to 3% in Niassa. Cropping rates for land devoted to shifting agriculture are also modest – a national average of 17%, equivalent to a rotation period of about 1 year in 6.

The area of land required for livestock grazing is subject to a large degree of uncertainty because reported estimates of the total stock of domestic livestock differ dramatically (including figures reported by separate divisions of the FAO), both over time and for different species. This study estimates that about 85,000 km^2 are required for grazing, with about 19,000 km^2 in mixed farming and 66,000 km^2 of range grassland.

Table 1 – Land Use by Province (km^2)

Province	Total area	Cultivable area	Land use in 1995				
			Permanent Agriculture	Shifting Agriculture	Grassland	Wooded Grassland	Shrub
Cabo Delgado	82,625	50,000	148	18,760	1,684	8,280	4,692
Gaza	75,709	4,000	2,760	14,100	6,724	15,760	11,252
Inhambane	68,615	9,000	672	15,336	1,748	8,284	2,832
Manica	61,656	29,000	68	11,456	2,404	11,524	8,092
Maputo	26,358	5,000	1,668	6,984	2,784	3,184	2,732
Nampula	81,606	48,000	864	43,524	796	2,876	2,060
Niassa	129,061	84,000	40	22,124	2,344	14,608	15,976
Sofala	68,018	22,000	836	10,336	7,072	10,840	8,648
Tete	100,724	49,000	16	16,724	4,940	18,176	19,256
Zambezia	105,008	60,000	3,072	31,876	5,060	6,612	4,000
Total	799,380	360,000	10,144	191,220	35,556	100,144	79,540

Source: Mission estimates based on FAO and INE data.
Note: Grassland is defined as land covered with non-woody vegetation; wooded grassland consists of grassland with a woody component that covers no more than 10% of the area; shrub is land with predominant woody component of between 0.5 and 3 m.

This study's projections – Table 2 – also suggest that the growth in land use for crop production and mixed farming area can easily be accommodated within the existing land resources. The intensity of cropping in areas of shifting agriculture in Cabo Delgado and Manica will increase to about 1 year in 3. Pressures on range grazing will continue to grow with the prospect of over-grazing under existing vegetation patterns in several other provinces.

For Mozambique as a whole there are ample land resources to cater for prospective increases in rural population and agricultural production over the next 10-15 years. Cropping rates on cultivable land will remain below 20% for the country, while total land used for cropping and mixed farming systems should remain less than 40% up to 2020. This should mean that there is ample scope for providing land for a rapid expansion of medium and large scale commercial farming that has not been included within these estimates. There are however two important qualifications to this broad conclusion.

- A significant part of the demand for commercial farming focuses on the extensive grazing of cattle and other livestock. While there should be no difficulty in accommodating demand for grazing on permanent pasture and in mixed farming, the development of extensive range grazing should discouraged in Tete and Manica – provinces that do not possess ample under-utilized range grazing areas.
- There is very little information on existing stocking rates and land use patterns set in the context of accessibility and infrastructure provision. Existing smallholder agriculture is concentrated in areas close to the major transport corridors. The same is true for land

licensed for commercial farming. While Manica Province faces a prospect of considerable land pressure in future, there are significant areas with good soil quality that are not currently farmed because either they are unattractive for small farmers and/or the difficulty of access. This reinforces the standard economic point that the management of land resources is as much about the development of infrastructure – in particular roads – as it is about legal aspects of land rights and policies.

Table 2 – Projections of Land Use for 2010 by Province

Province	Land areas (km^2)				Cropping Rates (%)		Overall Use Rate (%)	
	Food crops	Cash crops	Livestock grazing					
			Mixed farming	Range	Cultivable land	Shifting agriculture	Mixed farming	Grassland Variants 1 + 2
Cabo Delgado	6,061	496	1,236	1,059	13	34	16	22
Gaza	3,352	117	4,471	13,971	87	5	199	121
Inhambane	3,300	910	6,601	9,478	47	23	120	218
Manica	3,422	52	4,523	21,986	12	30	28	316
Maputo	715	294	2,295	3,296	20	0	66	103
Nampula	8,759	1,472	3,010	2,580	21	22	28	139
Niassa	3,170	71	348	299	4	14	4	3
Sofala	2,725	712	2,740	2,818	16	25	28	30
Tete	3,684	65	4,079	32,777	8	22	16	251
Zambezia	8,542	705	2,302	1,151	15	19	19	19
Total	43,730	4,895	31,604	89,415	14	20	22	127

Source: Mission estimates based on FAO / INE data.

Land Distribution

The estimated total number of farm holdings is in the range 3.1 to 3.2 million in the period 2000-03 with an average cultivated area of about 1.35 ha per holding and a total cultivated area of about 4.25 million ha. In 2000 there were about 4,500 holdings of more than 10 ha plus a further 50,000 holdings of 5 to 10 ha. In aggregate, holdings with more than 5 ha of cultivated land account for a little under 12% of the total area under cultivation.

By conventional criteria the lower threshold for large and medium-sized commercial farms would be at least 50 ha. Such farms account for less than 2% of cultivated land, so that it cannot possibly be claimed that such farms represent a threat to small-scale farming. Indeed, the problem is that the commercial farming sector is much too small to sustain the ancillary services and employment that would assist in the development of more commercial opportunities for small-scale farmers.

WATER

1. Water Availability

The rainy season in Mozambique runs from November to March followed by a dry period running from April to October. There is a significant variation in rainfall patterns between the humid north and the drier south, as well as between coastal and inland areas. Mean annual rainfall is around 800 – 1000 mm along the coast, around 1200mm in the mid-part of the country, and between 1000 – 2000 mm in the North, although there are significant variations within these regions.

Most of Mozambique's rivers run from west to east, draining from the high plateaus of central Africa to the Indian Ocean. There are thirteen main water basins in Mozambique, with the basin of the Zambezi River representing almost 50% of the surface water resources. An average of about 216,000 million m^3 of surface water is annually available of which 100,000 million m^3 (46%) is generated by local rainfall while the remaining 116,000 million m^3 (54%) originates in upstream countries. This indicates the importance of international upstream water resources for Mozambique.

The per capita surface water availability in the country is about 5,560 m3/inhabitant/year considering the runoff generated in the country or 12,000 m3/inhabitant/year including the flows from upstream countries. In comparison, the per capita water availability in Africa runs around 7,120 m3/inhabitant/year and the world number is 7,340 m3/inhabitant/year. Despite its comparable ranges, for a poor county with relatively low population density, these figures indicate that the country does not have an abundance of surface water.

In terms of ground water, hydro-geological conditions vary quite widely in the country, with a higher potential in the alluvial plains of the major rivers while yields in the crystalline basement north of Zambezi river are very low and in many other areas groundwater is saline or brackish. Ground water is the primary source in rural areas and it is used to supply some of the major cities – Pemba, Tete, Quelimane, Xai-Xai and Chokwe. Estimates suggest that 14 million Mozambicans – nearly 75% of the total population – rely on groundwater supply. The Zambezi and Incomati river basins have wells with yields of 70,000 m^3/day that would allow for agricultural development. Wells have an average depth of 50 m, allowing for the use of hand pumps. Large areas in the south and coastal plains have saline intrusions and other areas have deeper aquifers preventing hand pumps be used to extract ground water. Despite its importance, the country has not yet established a system for monitoring its quantity or quality.

2. Irrigation

Mozambique's agricultural potential is fairly high. About one-tenth of its 36 million hectares of cultivable land is suitable for irrigation. The total area of land currently under cultivation is

about 4.3 million ha, of which less than 1% is irrigated – about 40,000 ha. Only 0.9% of the country's cultivated land is irrigated, a ratio that is significantly less than that for many neighboring countries, especially South Africa (Table 3).

Table 3 – Land Use and Irrigation

Country	Land area (000 km^2)	Cultivated Area* (000 km^2)	% of land cultivated	Irrigated Area (km^2)	Irrigated area as % of cultivated area
Mozambique	799	42.5	5.3	400	0.9
Zimbabwe	390	32.8	8.4	1,170	4.0
Angola	1,247	30.8	2.4	750	2.5
Kenya	583	41.0	7.0	670	1.6
South Africa	1,220	148.0	12.1	13,500	9.1
Brazil	8,512	536.3	6.3	26,560	5.0
Chile	757	20.1	2.7	18,000	90.0

Source: CIA Fact book 2004, WB World Development Indicators 2004;
* cultivated land includes land defined by the FAO under temporary crops, temporary meadows for mowing or for pasture, land under market or kitchen gardens and land temporarily fallow.

Agriculture is currently responsible for 89% of surface water withdrawal. Expanding the area under irrigation for both small and commercial farming could make an important contribution to agricultural growth and to reduce rural poverty.

Water used for irrigation accounts for a very small share of total renewable water resources in Mozambique, so that in the aggregate, water availability should not be a limiting factor in the expansion of irrigation. However, the irregular distribution of rainfall and the lack of storage systems mean that water availability may be a serious constraint at a local level. Reliable water supplies for irrigation could be developed both from surface as well as ground water sources.

2.1 Costs and Benefits of Irrigation Development – Large Farms

Costs. Reliable information regarding the cost of irrigation development in Mozambique is limited. For commercial agriculture it is reasonable to use a rough figure of $3,000 per ha, and one-half of that for the rehabilitation of non-operational infrastructure[2]. The Government has set of target of rehabilitating nearly 80,000 ha of non-operational irrigation facilities within 5 years. Achieving this goal would involve an investment of nearly US$ 120 million or US$ 24 million per year. Since the country's historic rate of irrigation development is under 1,200 ha per year, such a program would represent an effort on a scale that is much larger than anything achieved in the past.

[2] Although recent figures of investments in Mozambique indicate higher unit costs

As an alternative reference point, total irrigated land in Zimbabwe amountes to 4% of its total cultivated area. If Mozambique were to aim to reach this proportion by 2020, allowing for a 5% annual growth in cultivated area, the total area of irrigated land would have to increase to about 350,000 ha, implying an annual target for irrigation development of about 20,000 ha. This is nearly twice the historic rate of irrigation development achieved in South Africa and four times that in Zimbabwe.

To put the investment requirements into perspective, the gross domestic investment in Mozambique has been an average of 40% of GDP in recent years, but this might be expected to fall to 35% of GDP in future – equivalent to US$ 1,700 million per year. In this context, US$ 60 million investment per year is not so large provided that it is matched by external financial resources.

Benefits. The contribution to value-added would be substantial. It should be possible to obtain an average value-added of US$ 2,000 per ha – equivalent to an addition of US$ 600 million per year to agricultural value-added. Total value-added in agriculture in 2002 was only US$ 790 million and with an agricultural growth rate of 6% excluding irrigation development this would reach about US$ 2.25 billion in 2020. On this basis, developing 20,000 ha of irrigated land each year would push up the growth of agricultural value-added from an average of 6% per year to 7.6% per year, apart from decreasing dependency upon rainfall and climatic conditions. Even with a social cost of capital of 12%, such an investment would yield a high return from a national point of view.

In terms of agricultural employment, under all except a few labor-intensive crops, agricultural production on irrigated land will not generate direct employment equivalent to more than 1 to 1.5 man-years per ha. The upper limit on the amount of employment generated by such a program would be 400-450,000 man-years. This is not insignificant but for comparison the rural population dependent upon agriculture is likely to growth by 2-2.5 million over the same period. There would also be significant indirect employment generation – at least one off-farm job for every on-farm job – but again the numbers are not large in relation to overall population growth.

2.2 Costs and Benefits of Smallholder Irrigation

Costs. Smallholder irrigation offers an entirely different balance between types of crops grown and also the between social and economic objectives. The costs of irrigation are much lower, perhaps as little $600-800 per ha[3]. Even using an average of $1,000 per ha, the cost of developing smallholder irrigation for an average of 20,000 ha per year should be no more than US$ 20 million per year. The majority of land under smallholder irrigation is currently used for double cropping of food crops, often intercropped, together with vegetables and some cash crops. Under existing cropping patterns, the average value-added is some US$ 500-600 per ha for the smallest farms, and US$ 800-1000 per ha in farms between 5-10 ha.

[3] Again, recent figures from Mozambique indicate higher unit costs.

Benefits. The contribution of investments in smallholder irrigation to agricultural growth will be much smaller than for commercial irrigation. The investment of US$ 20 million per year might increase total agricultural value-added by about US$ 250 million per year, assuming no major shifts in crop patterns, raising the growth rate from 6% per year to 6.7% per year. In terms of labor opportunities, the amount of employment generated, including family labor, will be no more than 1 man-year per ha but the investment required per $ of labor income is considerably more favorable than for commercial irrigation.

Summary. The figures above suggest that it would be hard to justify large public investments in irrigation for commercial agriculture. The external benefits in terms of employment are limited, while most of the value-added will be captured by the farmers using the irrigated land. The return to such investment should easily cover the cost of capital, making a substantial contribution to increasing or sustaining agricultural growth and shifting to more commercial agriculture, provided that investors have secure property rights over the land and irrigation infrastructure. It is politically easier and socially more fair to justify public investment in smallholder irrigation. A program of smallholder irrigation (for average size farms of 1.5 ha) would benefit about 13,500 households per year. This is not a large number compared with 3 million holdings of less than 5 ha: it is not clear whether there are other options available for investing in small scale agriculture that can yield a comparable return.

3. Water Supply

The provision of safe and reliable water supply to both urban and rural population is a major goal of the GoM as an essential step towards the reduction of extreme poverty. The level of access to water supply in Mozambique is similar to other low income countries in Africa (Figure 1), but it is still very low in absolute terms. Infant mortality is higher than other countries of similar income level with the poor access to safe water being one of the main causes of such high rates.

Despite the huge uncertainties regarding the precise numbers of people served, it is clear that there is a significant disparity between urban and rural areas, with a major bias of government spending towards the urban population in terms of spending per person. In line with the government's own priorities, this report strongly advocates a major shift of attention from urban to rural areas, and three major factors lead to such policy recommendation.

- First, 70 percent[4] of people without access to improved water supplies live in rural areas;

[4] Such figure, based on "Mozambique Public Expenditure Review – Background Paper on the Water Sector", by C.E. Finney and E. Kleemeier, May 2003, has been partly disputed by FIPAG and DNA, which suggest a figure of "only" 60 percent. The authors of the report and the authors of the background papers actually found that rather than being overestimated, such percentage may in fact be an underestimate of the true ratio of the number of people in rural areas without service in relation to the total number of people without service. The difference is anyway irrelevant to the point being made.

- Second, the costs of service provision are clearly higher in urban areas in Mozambique, so that limited resources can be used in a more cost-effective manner by focusing on rural water supply; and
- Third, the rural population has few alternatives for access to clean water, whereas household surveys show that about two-thirds of the urban population relies upon safe sources of water, though perhaps at a significant cost in time and money.

For these reasons, the Government and donor programs should focus attention much greater attention on rural water supply.[5]

3.1 Urban Water Supply

Official data from FIPAG suggest that 38% of the urban population was served by piped water from domestic connections and standpipes in 2004. These figures do not take into account the fact that many households without direct access to a water tap obtain piped water via (a) their neighbors' and relatives' domestic connections, (b) illegal connections and unaccounted for water, (c) water vendors who resell water taken from the piped system, and (d) other improved supplies, even if these are not ideal ways to supply water to urban residents. Analysis of the IAF 2002-03 household survey carried out for the CEM shows that 64% of urban households had access to safe drinking water, using a standard international definition.

The difference between FIPAG's estimate of urban coverage and the estimates reported by other sources highlights other unusual features of urban water supply in Mozambique. For example, the reported number of households served by piped water connections in Maputo – about 81,000 including both internal connections and yard taps – is remarkably low for city with a population of almost 1.6 million. By comparison:

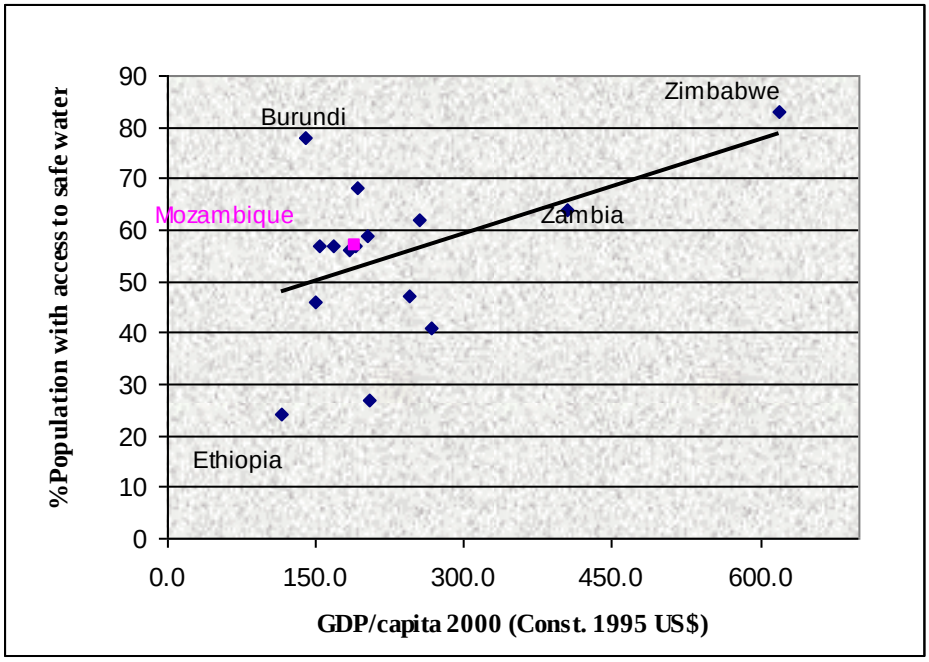
- Kathmandu in Nepal, which has an extremely poor water distribution system, has 135,000 households served by connections for a population of just under 1 million.

- Blantyre in Malawi has about 60,000 households served by water connections for a population of about 0.7 million.

It seems unlikely that differences in numbers of illegal connections, etc could account for the discrepancies. Clearly, different methods of collecting and interpreting data lead to substantially different policy conclusions, especially with respect to any assessment of the investment required to achieve, say, 90% access to piped water in urban areas. We are inclined to attach more weight to the results of the IAF survey, which was based upon a nationally representative sample of the urban population and our estimates are based on the IAF figures.

[5] The authors acknowledge that such transition has to be carefully planned, so that investments already committed and programs under implementation do not suffer major discontinuities; yet, this is not meant to say that a major change in focus towards rural areas should be postponed.

FIGURE 1 - Access to Safe Water in Low Income Countries



Source: African Development Indicators, 2004

The operational efficiency of urban water is generally low by international standards in terms of unaccounted for water (e.g., 51-56 percent in Maputo, Beira, and Pemba in 2001), hours of service (only 11 hours per day in Maputo and three other cities, and only 9 hours a day in Beira), overstaffing ratios, and bill collection efficiency (a median of less than 70%). The low levels of operational efficiency reflect poor management and incentives, skill shortages, and the usual range of problems that afflict most publicly-operated utilities in Africa.

Some approximate figures provide a rough assessment of amount of investment that would be required to achieve 90% access to piped water for the urban population. Figures from the IAF survey suggest that 64% of urban households have access to piped water. Average household size in urban areas was 6.6 and 32.1% of the population was classed as urban. The total number of urban households in 2005 is about 0.95 million and this will grow to about 1.35 million in 2015. Achieving a target of 90% urban coverage would involve doubling the number of households with access to piped water from 0.61 million to 1.22 million. Experience in other African cities suggests that the average number of households per connection (excluding standpipes) is typically about 1.5. Hence, meeting the target by installing house or yard taps would involve the installation of about 400,000 connections in 10 years – an average of 40,000 connections per year. Urban standpipes can serve 25-50 households, so that if half of the additional population served were to rely upon standpipes the goal would be a more realistic 20,000 new connections plus 1,000 standpipes per year on average.

The network cost of a new connection, including secondary and tertiary distribution, averages about US$ 250 (based on an analysis of financial estimates for a proposed EIB urban project), while upgrading water treatment and transmission capacity would roughly double this figure. Allowing an average investment of $5,000 per standpipe, the total investment would be of the order of US$ 15-20 million per year. [FIPAG's figures for upgrading water infrastructure are significantly higher than our estimates, but these would still not raise the total investment required above US$ 25 million per year.] An investment program of this scale could easily be financed, provided that the utilities charge tariffs that are designed to cover the full costs of service (see later)[6].

3.2 Rural Water Supply

Mozambique is a rural country and most of this population does not have access to regular water supplies and often obtain water directly from rivers and lakes or from shallow rudimentary wells (see cover picture). A vast number of existing rural water supply systems was damaged or destroyed during the civil war.

The GoM provides improved water supplies to the rural population through point sources and small piped schemes. While coverage data cannot be regarded as reliable, adopting a broad definition of coverage suggests that 20% to 40% of the rural population has access to improved water supply. This fairly broad band is a consequence of considering 250 or 500 people served by point sources. The GoM uses the higher limit of about 40% of the rural population covered[7].

Many factors contribute to the expansion of coverage (as well as the proper operation of the existing infrastructure) being a challenging undertaking. They include lack of capacity at community level, the very high cost of drilling throughout the country, difficulties in organizing and funding maintenance exacerbated by the limited availability of spare parts, and jurisdiction and political disputes at local and provincial level.

The cost of drilling water wells can be extremely high in Africa. In Mozambique, the average cost of a simple community water supply with a well and one hand pump is about US$ 12,000. Given the country's low population density, the average number of people served by each connection should be close to 100, making the per capita cost above US$100. This is some six times the figure observed in India.

Since the hand pump accounts for only one-fifth of the total cost, it is the high cost of drilling in Mozambique that is the main reason for the high cost of installing rural water systems in the

[6] Given the linearity of the simple estimates, if one assumes the parameter adopted by FIPAG of only 5 persons served per connection, this would basically double the costs of expanding service provision (from US$ 20 million to US$ 40 million per year), further strengthening the case that it is much more cost-effective to serve rural, as opposed to urban populations.

[7] A WaterAid evaluation in Niassa Province estimated 280 users per point source, a number closer to a more realistic standard of 250 people per point source.

rural areas of the country. The unit costs of drilling in South Africa, Malawi and Tanzania are less than one-half that in Mozambique. One factor explaining the high costs of drilling is the low population density, but poor organization, lack of competition in drilling reinforced by reliance upon parastatal drilling companies, and the generally high costs of construction are also important factors pushing up average costs.

If we accept the GoM's figures, the size of the rural population not served by functioning protected water sources was about 8.21 million in 2001. A more cautious estimate of the average number of people served by each source would push that up to 10.75 million. Allowing for population growth, the goal of achieving full coverage of the rural population by 2015 would involve a lowest estimate of the capital cost of US$ 255 million, and the number could be as high as US$ 670 million.

If (a) the cost of drilling and hand-pump could be reduced to no more than 50% more than the level in South Africa, and (b) locations are selected so as to achieve an average of 250 people served per source, the average capital cost would be reduced to US$ 25-30 per person. On this basis, the investment required to meet the MDG of halving the proportion of the population without access to clean water would be no more than US$ 140 million over 10 years. Financing an investment program of US$ 10-15 million per year should not be a major barrier[8], provided that the funds are used efficiently.

4. Water Resources Infrastructure

In Mozambique, there are only five large dams with sufficient storage capacity to have an impact on multi-year uses including flood control. These are Pequenos Libombos, Corumana, Massingir, Chicamba and Cahora Bassa. All these reservoirs incorporate in their operating rules a flood reserve during the rainy season.

The total water storage capacity in Mozambique is currently about 56,000 Mm^3, with a useful capacity of 45,000 Mm^3; about 90% of it comes from the Cahora Bassa dam. Since Cahora Bassa was developed primarily for hydro-power generation, its geographic location, its impacts to stabilizing other water uses, including flood control are limited.

Excluding Cahora Bassa, the remaining 5,800 Mm^3 of useful capacity represents only 5% of the mean annual runoff of the country's rivers, excluding the Zambezi. This is very low by any international standard and provides a clear indication that the country needs to develop the infrastructure to store a larger share of mean runoff. A storage capacity of 10-40% of the mean annual flow would be necessary for usage of 50% of the mean annual flow, with a reliability of

[8] The revised PARPA for 2002-04 proposed total spending of US$ 57 million over three years for water supply and sanitation (67% on urban water supply). Actual expenditure on this sector was estimated at US$ 20 million in 2001, broadly consistent with the figures in the revised PARPA. From any perspective, rural water supply should be the first priority for public expenditure on water supply, so that allocating two-thirds of the budget for this purpose seems appropriate and would cover most or all of the cost of the investments required to meet the MDG.

90%. The challenge for the GoM is thus to strategically develop a priority list of necessary dams in light of the country's needs and availability of funds.

FISHERIES

Mozambican fisheries are characterized by a variety of environmental conditions, catch technologies, ownership regimes and market structures. Capital intensive fisheries are partly or fully owned by foreign companies, and the products exported to international markets in Europe and in Asia. In recent years around 35 - 40% of the total Mozambican export value has been from the export of shrimp. Artisanal and subsistence fisheries are of crucial importance for food supply in large regions of the country, as fish products account for more than 20% of the animal protein supply.

Currently there are no opportunities for developing any other Mozambican fisheries matching the Sofala Bank industrial shrimp fishery in profitability and scale in the near future. Other relevant fisheries are the semi-industrial kapenta fishery of the Cahora Bassa reservoir and the semi-industrial line fishery of *rock bottom fish* in the Centre/Southern Mozambique.

The Sofala Bank Shrimp Fishery

The Sofala Bank shallow water shrimp fishery is by far the most important Mozambican fishery in terms of export value and influx of foreign currency. In 1999, eight thousand tonnes were exported at a value of US$70 million. Shrimp dominates the seafood export totally, covering 87% of the quantity and 93% of the value of the total export in 1998, Japan and EU being the most important markets of frozen shrimp. These markets are reached through processing companies vertically integrated with joint venture companies – Table 4.

Table 4 – Quotas and Catches – Shallow Water Shrimp Trawlers With Freezers, 1995-2003

Year	Quota[2] (t)		Catch (t)				
	Industrial	Semi-industrial	Industrial[1]	Semi-industrial[1]	Total[1]	Total[2]	Total[3]
1995		-	7,344	157	7,501		8,615
1996		-	7,043	396	7,439	8,123	8,183
1997	7,462	-	8,239	514	8,753	9,605	9,825
1998	7,650	-	7,172	976	8,148	8,559	8,559
1999	7,940	1,645	6,971	1,474	8,445	8,475	8,806
2000	7,750	1,505	7,419	1,721	9,140	9,420	9,429
2001	7,735	1,140	7,730	1,566	9,296	9,479	9,401
2002	8,000	1,165				9,222	9,472
2003	8,260	1,025				7,990	

[1] Eide et.al. (2003)

[2)] MdP, 2004
[3)]Total catch of Penaeus shrimps in Mozambique, FAO, FishStat 2004

No reliable estimates exist of the potential Mozambican benefits from the fishery. This applies to the allocation of quota rights, information on taxation and accounts of the involved companies, and basic catch statistics. Fishing effort has more than doubled since the early 80's, but catches have remained nearly constant during the period. Two main companies – Pescamar and Efripel – have been dominating the fishery most of this period, and in the early 90's were joined by Krustamoz: the three companies held together more than half of the total shrimp quota.

Mozambique interests are represented in the joint venture companies through Emopesca. The value of the company has been estimated to be in the range of US$100 million, but is potentially much larger. A potential annual flow of resource rent based on this reasoning from the shallow water shrimp resource alone may be in the range of US$ 10-30 million.

Until very recently Efripel and Pescamar were subject to a specific taxation regime relative to their exploration of natural resources (*Taxa de Exploração dos Recursos Naturais*, TERN). The companies did not pay license fees but have paid more than US$3.5 million in TERN in 1999. Recent information indicates that the two companies will now pay the normal license fees, which amounted to around US$2 million in 1999, excluding the TERN, which is now eliminated.

Even though it is difficult to estimate the resource rent collection, the net income generated by the fishery is estimated to be at least 40% of the total revenue. Assuming 80% of the export catch to be produced efficiently, the rent would reach an annual value of around US$24 million before tax (a corporate tax of 35% of the accounted profit). This implies that each ton is generating a net revenue of around US$3,800 (US$1,900 to the local partner[9]) plus the licence and other fishing fees and taxes paid to the Ministry of Planning and Finance (particularly on fuel). Besides, it creates at least one direct job per 15 tonnes of shrimp caught.

No public information is available on the amounts collected from the joint ventures by Emopesca and the values passed onto to the Ministry of Planning and Finance. The part of the net revenue kept in Mozambique by some of the quota-owners is likely to be higher than the one provided by the joint ventures through Emopesca. Unfortunately, this revenue is not always used in reproductive activities and duly collected by the Ministry of Planning and Finance.

Tuna fishery in the Mozambican Channel

A fleet of 6 companies and 74 foreign vessels (most of them from the EU) exploit tuna under license agreements, amounting to 3,000 tonnes in 1999. Tuna is managed within the framework of the *West Indian Ocean Tuna Organization* (WIOTO). Tuna are harvested on basis of

[9] Even such revenue appears not to be taking place because the foreign shareholder is able to manipulate technical assistance costs and some important import items as well as the export price. Most of this amount is in fact being transferred vertically from the joint venture into the foreign partner transport, processing and wholesale companies.

agreements with tuna associations in Japan, EU and others. Quotas, effort, and the annual compensation to be paid by the EU fishing rights are specified in the agreement. The annual compensation of a tuna quota of 8000 tonnes is set to € 600,000, and another € 75 per additional ton.

The EU-quota size (8000 tonnes or more) indicates that actual catches in the tuna fishery may have been substantially larger that the recorded catches. Mozambique has not been able to control the performance of the license holders, lacking patrol vessels and other instruments to strengthen monitoring, control and surveillance (MCS) of the fisheries. Illegal vessels have been known to operate in Inhambane waters.

The kapenta fishery of Cahora Bassa

The kapenta fishery, which has been developed recently, has almost fourfold the catch volume since mid nineties, and currently is around 10,000 tonnes a year. This makes the kapenta fishery the largest registered single catch volume in Mozambique. About half the catch is exported to the regional markets and the export value in 2001 was in the range of US$5 million. The importance of kapenta in the local markets as cheap food rich in proteins is also significant.

The gamba fishery

The price of deep water shrimp (gamba) is less than two thirds of that of the shallow water shrimp and the operational costs are higher. Excepting some South African experienced operators, the presence of other foreign ship-owners in the fishery has never been regular. The South African companies have a more comprehensive knowledge of the fishery, are able to rationalize costs, and catch targets due to the proximity of Durban and access to the local markets.

The fishery is often used as a buffer by operators with low shallow water shrimp quotas or ship-owners that split their annual campaign in order to cover the fishing peaks of both resources (the periods March-September for the shallow water shrimp and October-January for the deep water shrimp). Since the seventies deep water shrimp fishing licences have been sold at a lower value than the shallow water shrimp (20% of the international average price: around US$750-850 per ton).

Arrangements between *quota-owners* and *ship-owners* concerning the share of revenues are presently made on an 80/20% basis and the agreed joint ventures were never stable. Also, the recent agreement between Mozambique and the EU allocating 1,000 tonnes to European operators for the period 2004-06 resulted in no additional European presence in the fishery in spite of the annual compensation of around € 4 million paid in advance. This suggests that the deep water fishing operations, although profitable, are not producing high levels of rent.

FORESTRY

Occupying an area of about 20 million hectares or 20% of the national territory, the forests of Mozambique have the potential to produce a lowest bound of 500,000 m^3/year of sustainable logging. They are, however, a low-increment forestland with low density of commercial species leading to a potential annual sustainable harvest per hectare of only around 0.025 m^3/year. When compared with 1997/98 figures, the current total output level has decreased by almost 15%. Scanty evidence suggests that timber volumes extracted may still be beyond this sustainable harvesting level in many areas – Table 5.

Table 5 – National Wood Production (m^3) 1998-2003

Wood Types	1998	1999	2000	2001	2002	2003
Round-wood	119761	61482	84750	91215	130290	93216
Sawn-wood	28180	15323	19392	29600	29248	29928
Parquet	16394	6446	9269	3937	3715	2920
Plywood	662	661	764	664	720	82
Veneer	2792	992	826	913	1130	15
Posts	8570	3219	1028	-	5006	3570

Source: Relatório Estatístico Anual, Direção Nacional de Florestas e Fauna Bravia.

Most of this reduction was due to the recent export ban of first-class round wood, since it completely dominates the totals. However, processed wood has also declined during the late nineties and only in 2003 it has managed to reach the levels experienced in the mid-nineties. National total wood output is only around 127,000 m^3/year today, round wood accounting for 93,000 m^3, sawn-wood for 30,000 m^3 and posts, plywood and veneer for the rest.

The export ban of first-class species round wood aimed at increasing value added in the forestry sector. Exports are a very minor share of total production, having dramatically declined to less than 1% of the total output, also as a consequence of the export ban. Inversely, processed wood has rapidly increased to the level of 3%. Altogether, wood exports generate a value of only US$ 30 million annually.

With regard to forest fees, forest regulators granted a 40% fee reduction for all logs that are processed domestically. A higher exemption of 75% was given to the species umbila (*Pterocarpus angolensis*) and jambirre (*Millettia stuhlmannii*), which together account for 53% of total output. As shown in Table 6, forest license fees in Mozambique differentiate among species. This facilitates the right rent capture. In order to keep up real monetary values, a 2002 government decree radically increased annual license fees, in some cases, as for precious species, by almost 20 times in relation to 1998. Such abrupt variation faced strong opposition from operators, local governments and politicians, based on the fear that the whole sector would be forced to dramatically cut down its production and that illegal cutting would dominate.

In reaction to this outcry, rates were cut by half in 2003 and this likely is to prevail until 2005. Concession operators were given the opportunity of monthly payments following the production flow, whereas simple operators could pay only up to four instalments.

Table 6 – License Fee Structure per Cubic Meter, 1998-2005

Wood Class	1998		1998		2005	
	10^3 MT	US$	10^3 MT	US$	10^3 MT	US$
Precious	105	8.5	1,000	41.8	2,000	83.7
1st class	65	5.2	250	10.5	500	20.1
2nd class	45	3.6	150	6.3	300	12.6
3rd class	30	2.4	100	4.2	200	8.4
4th class	20	1.6	50	2.1	100	4.2
Estere 3rd class	50	4.0	75	3.1	150	6.3
Estere 4th class	30	2.4	50	2.1	100	4.2
Charcoal	2.5	0.3	5	0.2	10	0.4
Others	25	2.0	50	2.1	100	0.2

Note: All US$ values converted at annual average exchange rates

As can be seen from Table 7, fee revenues have increased five times with the last fee revision, from MT 11.9 billions in 2002 to MT 54 billions (US$ 2.26 millions) in 2003. Despite this large increase, forest license fee revenues still account for only 0.4% of total government revenue.

Table 7 – License Fee Revenues, 1998-2003

Year	Revenue (10^6 MT)	Revenue (US$)
1998	3,377	270,000
1999	3,787	300,000
2000	7,471	530,000
2001	11,855	580,000
2002	11,856	500,000
2003	54,077	2,260,000

Source: Relatório Estatístico Annual, Direcção Nacional de Florestas e Fauna Bravia

Such a low revenue-raising effect is not necessarily an indicator that the current fee scheme is not capturing forest rents. In order to analyse that, the study developed a theoretical reasoning to define rent and estimate whether or not current rents have been set and collected at appropriate levels. Based on a series of balanced and well accepted assumptions indicated in details in the background paper, it seems that the current average license fee for first class wood is within the

expected range for scarcity rent values, and that the expected doubling in 2005 could be seen as the upper limit for an efficient rent pricing, particularly if one includes the 15% reforestation surcharge on fee rates.

It is also relevant to make the same exercise for other wood classes. A rapid assessment of few observations on the relative prices of some species in each class seems indicate that they are in line with fee schedule, although such assessment needs to be fully verified in a more comprehensive way.

MINING

Mining is a traditional activity in Mozambique since gold and silver attracted the interest of both Asiatic and European peoples as far back as the year 212 A.D. The country has favorable geology for mining activities, but industrial production is modest and, apart from tantalite, limited to building materials: stone crushing, limestone, clay, ornamental rocks, and others (Table 8). The sector is still mostly composed of small scale and manual operations, the great majority being illegal and confined mainly to the extraction of gold, precious and semi-precious stones scattered all over the country. The contribution of the mining sector to the economy is currently small, with a formal contribution of less than 2% of GDP.

Table 8 – Value of Annual Mineral Production (US$)

Mineral	1999	2000	2001	2002	2003*
Sand	-	898,620	1,394,052	2,387,439	4,116,096
Clay	-	2,011,220	2,051,559	2,730,773	3,255,720
Bauxite	567,576	585,367	618,631	656,568	849,117
Coal	94,306	177,265	303,596	478,632	404,162
Limestone	-	5,855,900	7,292,300	13,012,323	13,483,720
Gold	186,556	224,065	218,310	167,702	623,176
Tantalite	-	625,000	675,000	1,172,500	4,717,375
Building stones	2,211,324	3,612,845	3,022,295	4,774,395	4.443,008
Others					
Total	7,159,836	15,861,359	16,552,082	26,293,231	32,789,559

Source : DNM
* - 2003 production up to September

Large scale mining has generated only 3,000 formal jobs in the country. Reliable statistics regarding the number of people involved in the artisanal or small scale mining do not exist, but rough estimates suggest numbers well in excess of 50,000 people nationally. If seasonal

workers and farmers, who combine their agricultural activities with panning in some periods of the year, were included in the estimate, the number could reach 100,000 people.

Fiscal revenues arising directly from mining totaled about US$800,000 in 1997. No systematic data is available concerning the recent evolution of fiscal revenues from the sector, which are estimated to be about US$ 3-5 million annually. Since small scale production of gold and bauxite re-started in Manica in 1990, mining exports rose from US$ 4.5 million in 1992 to US$ 32 million in 2003. It is estimated that about US$ 10 million of gold and US$ 30 million of semi-precious stones are exported through informal channels each year, which represent some US$ 1 million in forgone fiscal revenues at current royalty levels.

The number of private operators involved in mineral exploration, which is a good indicator of the potential of the sector as well as the degree of perceived risk, has increased by more than 100% between 2001 and 2003, with the number of foreign firms having jumped from 30 to 77. Exploration expenditures were around US$13 million in 1997 and then varied between US$ 15-25 million since then. The trend is encouraging but the absolute amount is far bellow the level commensurate with countries with similar geological potential, which can attract annual exploration expenditures of US$ 50-100 million per year.

With the arrival of foreign investors in the 1990s, targets have shifted to gold and heavy mineral sands, and more recently been diversified to include base metals (copper, zinc, nickel), coal, and industrial minerals. Two heavy mineral sands projects are at an advanced stage of development: (i) the Moma project, with a total capital cost of US$ 220 million. At full capacity (expected in 2006), the project should produce 625,000 tones per year of ilmenite, 34,000 tones of zircon, and 14,000 tones of rutile, generating annual export revenues of about US$ 80 million and employing directly 425 people; and (ii) the Limpopo Corridor Sands (to begin production in 2008). The first phase of the project is expected to produce 375,000 annual tones of titanium slag, with a capital cost of about US$ 500 million. Annual sales are estimated at about US$ 300 million, with about 900 new jobs created. A second phase is expected to increase capacity to 1 million tones per year of titanium slag.

Given the advances in sector reform achieved over the last five years, the development in the amount and the quality of the geological information available in the country, and the improvement in the quality of the services delivered by key government institutions, Mozambique's mineral resources are bound to experience a prolonged period of rapid growth. With the commissioning of the two heavy mineral sands mentioned above and the rehabilitation of the Moatize coal field, potential long term export revenues could reach US$ 500 million by 2010 and as much as US$ 700 million by 2015.

Impact on poverty. In terms of poverty reduction, during and after the conflict period the extraction of gold and gemstones has been serving as an economic buffer, being one of the few activities providing immediate cash income for the poorer Mozambicans. For the vast majority

of them, mining is a part-time activity undertaken in parallel with subsistence agriculture, being an intimate part of rural societies, traditional village structures and their economies.

Recent household surveys have shown a dramatic improvement in poverty rates (based on per adult equivalent consumption) where the household head's primary occupation is mining. These poverty rates are much lower than the national average and have declined sharply since 1996, specially in the Center and Southern parts of the country (Table 9).

Table 9 – Poverty Rates by Sector of Employment of the Household Head*

	1996				2002			
	North	Centre	South	Total	North	Centre	South	Total
Mines	47.3	57.0	48.8	48.9	32.5	15.2	25.6	23.6
Manufacturing	49.8	66.5	41.9	51.8	52.5	22.8	50.6	35.1
Construction	54.3	64.5	40.5	49.3	35.1	25.6	55.2	43.3
Services	25.5	46.3	39.3	38.5	19.5	22.9	49.1	36.7
Education	54.8	48.2	31.0	46.3	18.0	7.4	26.2	16.6
Health	16.7	40.6	55.7	45.0	26.4	32.3	44.4	38.0
Public Administration	35.2	37.2	24.6	30.1	19.0	21.5	33.8	25.7
Agriculture	50.1	59.1	60.7	56.2	39.6	30.4	60.4	39.3
Total	48.9	57.7	51.5	53.3	36.2	28.0	52.7	37.0

***** - based on per adult equivalent consumption

Despite the obvious potential benefits from the activity, the associated costs and benefits may accrue unevenly to different groups. Mining can reinforce poverty directly by damaging the environment on which subsistence economies depend on, by creating new social and economic problems, while communities are often not given full opportunity to participate in discussions on proposed projects. The outcome will often depend on policy and institutional frameworks in place, as well as the government's political commitment to support often dispersed and isolated, less informed and less empowered groups.

III. NATURAL RESOURCES MANAGEMENT POLICIES, IMPLEMENTATION AND GOVERNANCE

SUMMARY OVERVIEW

Natural resources management policies in Mozambique suffer from one fundamental general problem. The framework laws are clearly designed to protect the poor, and like other sector laws in the country they represent a major achievement of the Mozambican people. The laws rely on the use of instruments for the management of natural resources which have proven successful in most OECD countries as well as in many developing countries. This includes long land leases, water basin committees, delegated management of drinking water supply, quotas, concessions and fees in fisheries, forestry and mining. Yet, too much attention has been given to ensuring an equitable access to resources with much less attention given to the specific mechanisms for ensuring access, for promoting an efficient use of resources, and also for monitoring and enforcing compliance with the norms. Between the Constitution, the laws, regulations, and final implementation and enforcement there is a myriad of factors leading to quite poor outcomes.

Rome was not built in one day. An effective system for managing natural resources can also not be developed in a matter of 5-10 years. Many of the laws are very recent and require time to be adequately "absorbed" and implemented, especially if a genuine attempt is made to ensure the participation of a wide range of stakeholders. Implementing new and complicated institutional arrangements is difficult in terms of the required human and financial resources, and depends on complex cultural factors. In this respect, there is a sense in which the best is the enemy of the good: resources might have been allocated to implement modest but feasible improvements, as opposed to more ambitious and complex structures which succeeded in countries with a much longer history of institutional development.

As an illustration, the National Water Policy is designed to implement a system of river basin management following the model developed in Western Europe and now adopted in Brazil and many other countries. However, in all countries river basin agencies have required decades to develop into effective institutions that are really capable of discharging the responsibilities given to the ARAs in Mozambique. In the meantime, the only agency that is really operational – ARA Sul – is still very far from having the resources and capacity to monitor and charge properly for bulk water, or to define and implement priority schemes to rehabilitate or expand irrigation infrastructure.

In many cases, the regulations appear to have been "captured" by government bureaucracies which have created unnecessarily complex procedures that may deviate, in implementation, from the original intentions of the framework laws. Major opportunities for rent seeking and corruption have been created, harming both private commercial interests and the poor. The question is whether this has been an unintentional process, fundamentally a consequence of weak

institutional capacity, or whether it reflects the presence of vested interests which are capable of directly influencing the bureaucracy.

The study did not attempt to provide a detailed analysis of such governance issues, but it highlights the obvious gaps between the framework laws, the regulations which follow, and their actual implementation. Since all the resources analyzed are owned by the State, the opportunities for political and bureaucratic rent seeking are reinforced. The evidence available to the study team suggests that governance problems in natural resources management in Mozambique are, unfortunately, not too different from those in many other countries with a wealth of such resources. This problem must be seriously addressed by the government in order to maximize the returns from the use of the country's vast potential of its natural resources.

One important policy issue in Mozambique concerns potential trade-offs between efficiency and equity. This is an old problem with no easy solutions: the urgent need to promote economic growth calls for more capital-intensive and efficient forms of production; the urgent need to tackle poverty in turn calls for more labor and resource intensive uses of natural resources. Since investment resources are also extremely limited, a potential conflict may exist. As discussed in the previous chapter, the wealth of natural resources in Mozambique make such choices less burning, except perhaps in the case of water resources.

The wealth of natural resources should not however hinder political decisions to make clear choices in different specific regions and different specific circumstances. There is, for instance, abundant land that can be allocated for both subsistence and commercial agriculture, but the rules and incentives to promote each in specific regions have to be clearly spelled out, so that the land is put to efficient uses, or to help support the poorer peasants. Otherwise, as the country has perhaps been witnessing, there is an enormous amount of resources not being utilized, or being poorly utilized, a paradox for a country as poor as Mozambique.

This chapter looks at natural resources management policies, their implementation, and mutedly discusses some governance issues – or identifies opportunities or evidence of rent seeking behavior. In a very simple form, the old saying that "the devil is in the details" seems very appropriate in the context of natural resources policies in Mozambique. Even though they are not all at the same stage of development, major improvements in both efficiency and equity terms, as well as in terms of minimizing opportunities for rent seeking, could be attained in the management of all five resources analyzed in the study. Overall, the study identifies five major sets of issues associated with the existing policies in natural resources, although since they are all closely related there are major overlaps.

A. A major gap exists between written regulations and their actual implementation, with excessive government interference. Monitoring capacity is minimal.

The way regulations are written and implemented creates major opportunities for rent seeking by the government bureaucracy. There is excessive government interference in part originating from the fact that all resources belong to the State, introducing an unnecessary level of uncertainty, bureaucracy, and unfavorable business environment. In the area of monitoring licenses, leases, etc, where the government should have a strong grip, it shows weak capacity. This lack of capacity to monitor in turn creates opportunities for interference and rent seeking. The current regulations and their actual implementation have been leading to both inefficient use and capture by elites, contrary to the objectives of the overall framework laws.

Many examples support the above conclusions. The transfer of land titles requires the land to have been developed in accordance with the authorized land use plan. The government capacity to actually monitor this is minimal, and in enforcing the regulation there is great scope for bureaucratic discretion and thus either corruption or meddling, creating a very uncertain business environment. In the case of fisheries, there is a complex combination of quotas, license fees and payments for royalties which do not apply uniformly to all industry, but are differentiated in accordance with criteria which are obscure. It is difficult to trace revenues, licenses, allowed catches, and other critical economic parameters of the sector. This hinders the effective collection of government rents and monitoring the extent to which the industry is in compliance with regulations.

B. Public ownership of natural resources does not per se hinder efficient use and equitable access

This applies mostly to land and forests. Much attention has focused on the alleged consequences of the fact that land can only be held on leaseholds rather than freeholds. While security of tenure associated with ownership rights has a positive impact on investment and agricultural growth, the study suggests that the real issue is not the legal technicalities of land ownership or leaseholds but whether the associated property rights are secure, enforceable, and transferable without excessive bureaucratic interference or discretion. The problem is thus not the provisions of the Land Law per se but with the bureaucratic structure and legal precepts that underpin its implementation.

A similar situation occurs in the forestry sector. The government is already making concessions for larger commercial firms. The mechanism is in its infancy and as more experience is gained the government should also introduce bidding mechanisms to award concessions, a more efficient way of capturing rents and inducing efficient exploration. With the right combination of bidding and incentives, forest resources can be explored in a sustainable way, generate appropriate rents, while they remain property of the State.

C. Despite the good framework laws, major improvements in both efficiency and equity terms could be achieved

The use of instruments which have proven successful in other countries is no guarantee that they will succeed in Mozambique. A classic failure is the assumption about the institutional capacity to actually implement, monitor and enforce regulations. The absence of such capacity leads to abuse of the legislation both by the government and by private interests, with the consequence of a very inefficient use of resources. The current administrative license fees in the forestry sector, for example, should incorporate a number of new parameters to better capture windfall profits and minimize inefficiency losses. The government is right to introduce bidding mechanisms as a way of capturing rents in the sector.

The Land Law fails to address the balance between more intensive or more extensive land uses. The result has been that few partnerships between large land users and local communities have taken place, many small farmers have been displaced without due process or compensation, and capital-intensive operations continue to complain about the difficulties of obtaining secure leases and navigating the bureaucratic system.

In the fisheries sector, in several cases it is difficult to discover the connection between policy objectives and the choice of management instruments, which often seem to be more based on traditional thinking (biological capacity) than on efficient removal of market failures.

In the case of urban water supply, the low levels of operational efficiency reflect poor management and incentives, skill shortages, and the usual range of problems that afflict most publicly-operated utilities in Africa. The contracting out to a private operator via a lease contract for Maputo combined with a management contract for four other cities was a major step forward, although progress in improving operational and financial performance has been slow.

D. The government is abdicating significant resources by not charging rents and access

The fact that resources are property of the State does not mean that they should be freely available to all individuals. The government should not abdicate its revenues from rents or from services provided in name of "social interests". Experience from Mozambique and many other countries in the world suggests that such subsidies are by and large captured mainly by the upper middle classes and not by the poor. The evidence shows that there is a very high willingness to pay by most agents, including the poor, so there is no major justification for the government to abdicate such revenues, which could be re-invested in the respective sectors. Such revenues are often significant and can be used to respond the more urgent social demands by the poorer populations. For the larger commercially oriented investments, it would suffice to create the appropriate non-discriminatory and transparent business climate to be occupied by a combination of international and national private interests and donors.

There are several striking examples of such problem in Mozambique. Since all land is State property and the government grants occupation licenses on payment of extremely low administrative fees that are almost unrelated to its potential value, speculation becomes particularly attractive. There is no reason for the profits made by the initial occupiers to be exempt from payment of some amount in lieu of rent, even recognizing that it is difficult to measure the real value of such rent.

Another major case is charges for both bulk water and urban drinking water. There are two tariffs for bulk water use: one of US$ 0.0020/m^3 for agriculture and one of US$ 0.0035/m^3 for urban and industry. Under any perspective such tariffs are much too low and limit the capacity of the government to expand both drinking water supplies to rural areas as well as to finance small-scale irrigation schemes.

In the case of urban water, the average price actually paid per cubic meter by domestic consumers in 2001 was US$ 0.23/ m^3 for those with domestic connections, US$ 0.53/m^3 for those who purchase water from public standpipes, and US$ 0.77 m^3 for water coming form privately run standpipes. Surveys of willingness to pay for water in poor countries consistently show that urban households are willing to pay more than US$ 0.50 per m^3 for piped water. The governments traditionally argue that it is politically difficult to raise water tariffs, which is often claimed to be a free good. The incapacity to cover even its operating costs makes it impossible to expand coverage, given the very limited budget availability. The people who fall sick due to poor lack of access or to waterborne diseases are typically the populations and children in poorer urban and peri-urban areas. Such limited investments may seriously threaten the attainment of the MDGs for the water sector.

In the case of both fisheries and forestry, the government has implemented good protective mechanisms for the poor. Fish resources are open access close to the coastal areas, and access to forest resources require only simple licenses with almost no conditions or payment. Rent prices for the larger operators are at appropriate levels, but the study identifies areas for major improvements in the charging mechanisms. In the case of fisheries, for example, joint venture companies are largely controlled by foreign companies, which are the actual operators, with significant revenues being lost if not abdicated.

E. The government is not adopting clear and transparent procedures

Clear and transparent rules are very basic requirements of a good business environment. They are also critical to make bureaucratic and political bodies socially accountable and, thus, to minimize rent seeking and corruption. There are absolutely no reasons for the government not to introduce all transparency measures possible in the policies and regulations of natural resources. This would be much in line with the laws which have the protection of the interests of the poorer Mozambicans as one of their main goals. For instance, in the concession of licenses and equivalent permits in all sectors, the poor communities are effectively alienated from the process of resource allocation. Transparency is lacking also in the publication and dissemination of

various forms of data and information: catch statistics, land rights and land transactions, fines imposed and collected in all sectors, forestry management plans, and others.

In the case of lands, rights to large areas of land are being acquired or transferred on the basis of expectations about its value in future uses, while the land itself is not being farmed or used for other purposes. Such rent-seeking behavior is encouraged by a system of acquiring land rights that lacks transparency and allows the well-connected to obtain large holdings at virtually no cost.

In the case of fisheries, licenses and concessions are granted under very un-transparent procedures, a problem that is acknowledged even by the fisheries administration. The Ministry of Fisheries expresses a willingness of implementing more transparent procedures as this will simplify routines and responsibilities and make the situation easier for the administration. The problems acknowledged are lack of competence and political authority for doing this.

LAND

From an economic perspective the central issue of the land debate concerns the best strategy for promoting the intensification of agriculture, focusing on the expansion of more capital-intensive forms of land use. A major issue in this respect is the role of medium and large scale commercial farming, and the one of small-scale farming concerned with meeting subsistence needs. For this reason, policies about access to land involve real economic choices even though land resources in general are abundant.

Legal and institutional arrangements. Since Mozambique is a large country, thinly populated and with large areas of unutilized land, it should be possible to resolve conflicts over land by a process of separating competing uses or users. The 1997 Land Law, followed by the secondary legislation passed in 1998, represents an attempt to address these conflicts. Some of its core principles include:

- All land remains property of the state, but land leases can be granted for up to 50 years. They are renewable, inheritable, and transferable subject to prior administrative authorization.
- The award of a lease is subject to the presentation of a land use or development plan, which can be cancelled if the lessee fails to comply with its conditions.
- Investments in infrastructure and improvements on leased land can be bought and sold, again requiring an administrative authorization.
- Traditional land use rights are recognized and formalized through a system of community land management, with co-titling of community lands.
- Existing users of land are protected provided that they can demonstrate “good faith” occupation of the land. This need not rest upon documentary evidence.

- Local participation and consultation are granted in the management of natural resources and in procedures leading to the award of land leases.

The fundamental goal of the 1997 Land Law was to protect the traditional land use rights of small farmers. However, the Law perhaps fails to address the balance between more intensive or more extensive land uses, which is equivalent to balancing traditional communities rights with attracting more capitalized and commercially oriented farming systems. The result is that few partnerships between large land users and local communities have taken place, many small farmers have been displaced without due process or compensation, and capital-intensive operations continue to complain about the difficulties of obtaining secure leases and navigating the bureaucratic system.

Land speculation. Rights to large areas of land are being acquired or transferred on the basis of expectations about its value in future uses, while the land itself is not being farmed or used for other purposes. From a stricter theoretical perspective there is nothing improper about such speculation, excluding, of course, the use of privileges to ensure appropriation of nearly grand-fathered land rights. Owners or leaseholders will only hold land for "speculative" or any other purpose if the expected gross rate of return yielded by the land exceeds the holding cost. It would be perverse to adopt policies designed to reduce the expected gross rate of return on holding land, since these would always have a parallel negative effect on investment and agricultural development.

On the other hand, the intention of the Land Law is that the award of secure land rights is contingent on the implementation of a development plan – for all of the land. Hence, the emergence of holdings of hundreds or thousands of hectares, of which no more than 5 or 10% has been or is being developed, contravenes the spirit and, perhaps, the letter of the law and its regulations. Policies to address this issue should focus on raising the cost of holding land – in particular on land taxes, which function as rents under current arrangements.

Rent-seeking behavior is further encouraged by a system of acquiring land rights that lacks transparency and allows the well-connected to obtain large holdings at virtually no cost. The existing mechanisms for the award of land rights cannot be expected to deliver either efficient or fair outcomes in current circumstances. If the prospective profits from land conversion are large, a bureaucratic system cannot control the process of land acquisition or transfer other than by completely suppressing all manifestations of market transactions. A combination of greater transparency and more attention to market incentives is required to produce outcomes that are seen as being reasonable and capture a share of the surplus generated by development for the State as landowner.

Leasehold versus freehold land rights. Much attention has focused on the alleged consequences of the fact that land can only be held on leaseholds rather than freeholds. However, it should be noted that almost all land in two of the most property-intensive jurisdictions in the world – Hong Kong and Singapore – are held on government leases of 50

years or more. Neither Hong Kong nor Singapore has any shortage of prospective purchasers for land backed by financial institutions that regard 50 year leases on development sites as perfectly adequate collateral.

Of course the security of tenure associated with ownership rights has a positive impact on investment and agricultural growth. Also, unless farmers are able to pledge ownership rights as collateral for loans, financial institutions will not be willing to provide the funds required to finance and to sustain the growth of commercial agriculture. However:

- Most financial institutions have little commercial interest in lending to smallholders and even medium-sized farmers.
- Such organizations have limited interest in agricultural land as collateral.
- Even in the case of medium or large farmers, financial institutions are often reluctant to rely too much on any form of land assets as the collateral for loans.
- Policies designed to protect family and communal interests in the small-scale farming sector may be irrelevant and inappropriate for commercial operators with very different requirements for capital and access to financial markets.

Despite such arguments, it is still often claimed that either the formal recognition of private ownership of land or other changes to the land law are required to underpin the development of commercial agriculture. The real issue is perhaps not the legal technicalities of land ownership or leaseholds but whether the associated property rights are secure, enforceable, and transferable without excessive bureaucratic interference or discretion. The problem is thus not the provisions of the Land Law per se but with the bureaucratic structure and legal precepts that underpin its implementation.

The key issue in this regard in Mozambique seems to be what alternative form(s) of realizable security can be offered by commercial farmers to guarantee payment of their loans. Since long leases can still be obtained at minimal cost, commercial farmers main problem is how to bring such land into cultivation. In the absence of substantial flows of capital from outside the country, this investment must be financed from internally-generated funds or borrowing. Without security, debt finance will play a minimal role in funding the expansion of commercial farming. But, the greater the reliance upon cash flow, the slower will be the growth of the sector.

Loan finance for such investments will always be limited because the risks are indeed high. Whether the benefits of more rapid growth in commercial farming are sufficient to offset the perceived political and social costs of adapting the current legal structure is a moot point. The problem will not go away, unless either (a) more equity capital can be attracted into commercial farming and/or (b) some alternative form(s) of security can be devised to allow commercial farmers to expand their activities by mobilizing debt finance.

Implementation of the licensing regime. Responsibility for the award of leases lies with DINAGECA. In 2001 it introduced a simplified procedure for responding to applications for

land leases. The number of applications for titles dealt with between October 2001 and October 2003 was just over 5,500 covering a total land area of 3.9 million ha, although the amount of land covered by the approved applications is not reported. This area represents 90% of the total area of cultivated land in the country.

It is generally agreed that the judicial system is poorly equipped to deal with disputes about land rights and may be susceptible to corruption and political influence. Thus, property rights associated with leases and capital improvements may be neither secure nor enforceable, at least in case where any conflict involves influential individuals or interest groups. But no change in the law is likely to solve this problem.

A second issue is the scope for bureaucratic discretion and thus either corruption or meddling when leases are transferred. The main pressure point concerns whether or not the land has been developed in accordance with the authorized land use plan. It would be much better to rely upon an appropriate set of economic incentives for the efficient use of land resources than on bureaucratic monitoring. Penalties and enforcement for non-compliance with conditions on land leases must be simple, unambiguous and easily enforceable. In practice, this means that payment of the lease fee or land tax is the only condition that can reasonably be enforced.

Current land taxes. A crucial issue for land policy in Mozambique is the level, implementation and enforcement of land taxes, which are equivalent to the rent payable under a land lease. The regulations to the 1997 Land Law, published in 1999, specify a standard tax rate of MT 30,000 per hectare but with a series of multipliers according to holding size, location and use, so that they range between a minimum of MT 7,500 per ha up to a maximum of MT 180,000 per ha.

Land users relying upon customary occupation rights are supposed to, but in practice do not pay land taxes on the same basis as all other land users. To the extent that customary rights are held by communities rather than individuals, then these might be interpreted as non-profit organizations which benefit from a discount relative to the land tax payable by ordinary nationals.

The elaborate differentiation of tax rates perhaps makes little sense in the context of the actual distribution of land holdings, because it is almost impossible to implement a sensible differentiation in the application of land taxes to such land. The Agricultural Census of 1999-2000 shows that there were only 60 holdings with more than 100 ha of cultivated land (out of 3.06 million holdings in total). It is extremely unlikely that there are more than 1,000 holdings in the whole country with more than 100 ha of land in total, suggesting that there is little point to applying higher tax rates to such holdings.

Similar considerations apply to the discrimination against non-nationals. The effect of these provisions is to ensure that either (i) non-nationals operate in partnership with nationals who obtain the right of land use, or (ii) non-nationals establish and operate through registered

companies. Again, the higher tax rates for non-nationals are likely to be ineffective and any redistributive effect could be better achieved by other tax instruments.

In summary, the discriminatory structure of land taxes is almost certainly ineffective and encourages the inefficient use of land. It is much more important to apply and enforce a simple structure of land taxes with minimal differentiation between categories of user and use.

Land rents versus land taxes. Any reform of land taxes must be seen in the broader context of fiscal policy. As in other similar countries, the share of the tax burden falling upon the agricultural sector and the rural population is low in relation to their shares in national income and consumption. Yet, there are no special reasons to exempt agricultural incomes from the general taxation of income and profits. The difficult question is how to realistically measure the amount of rent that the leaseholder would be willing to pay for use of the land.

If the land were either under private ownership or (relatively) long leaseholds, a land tax would be a non-shiftable tax on the return to occupying land. However, in Mozambique all land is state property and the government grants occupation licences on payment of administrative fees that are almost unrelated to the potential value of the land concerned. This is why "land speculation" is so attractive. There is no reason for the profits made by the initial occupiers to be exempt from payment of some amount in lieu of rent.

If the Government were to establish the principle that land titles will be subject to a land tax in lieu of rent, then all future occupiers will build this expectation into their decisions regarding how much land to occupy and how much to invest in improvements. The effect of such a tax should be neutral from perspective of subsequent occupiers.

The purpose of implementing a land tax in Mozambique is not the collection of revenue but the creation of a framework to ensure that public land is used in a more efficient and equitable manner. Leaving aside the vast majority of very small land holders, there are less than 5,000 farms with more than 10 ha of cultivated land and about 50,000 farms with 5-10 ha of cultivated land. These are the holdings that should be the focus of a serious effort to assess and collect land taxes, even if their likely fiscal impact were to be minimal. Land taxes at current levels are unlikely to raise more than the equivalent of 0.2% of total tax receipts.

A more interesting perspective is to regard the level of land taxes as a form of rent payment. National accounts data show that agriculture contributed 22% of total value-added in 2002, equivalent to 18,400 billion MT. Hence, total revenue from land taxes of 13 billion MT is equivalent to only 0.07% of agricultural value-added. This is far below any reasonable estimate of the proportion of such value-added that could be assigned to land rents.

If a land tax in lieu of rent for holdings with more than 10 ha of cultivated land were considered, and assuming that the share of rent to value-added is 10% (a rather low figure by comparison with other countries), then the imputed rent would be 55-60 billion MT or US$ 18-20 per hectare

of cultivated land per year[10]. This is an order of magnitude higher than the nominal basic rate under the current structure of land taxes and the actual rate is much lower for most farmers.

The implication is that a land tax as a substitute for rental payments should be applied at a much higher rate than the current land taxes. The fact that an imputed rental of US$ 20 per ha is only relevant for land that is under cultivation, while land under shifting agriculture or grazing could not generate an equivalent rental income should be the specific scope of the higher tax. It should precisely aim to discourage the holding of land in low value uses, giving an incentive for those with large areas of leased land either to bring it into cultivation or to divest of their titles to others with the necessary resources.

Taxing the area of land used is simple but crude, since it fails to take account of location, soil quality, climatic conditions, access to water resources, and other factors that make land more or less valuable. Evidence for implementing such a tax in Mozambique is non-existent. Both practical and economic considerations point towards reliance upon a simple tax per hectare of land occupied with some stratification to reflect differences in potential rental values associated to such conditions to the extent that this is administratively possible.

WATER

The institutional and legal framework for the water sector in Mozambique is overall coherent and is largely consistent with experience and good practice in many middle and high income countries. The management structure was established with the approval of the Water Law in 1991. The Ministry of Public Works and Housing (MOPH) has the central role in water management, with cross-sectoral coordination ensured by the National Water Council, a consulting body of the Government. Within MOPH, the National Directorate of Water (DNA) is in charge of water management. Following the publication of the National Water Policy in 1995, CNA has focused on policy and the overall structural framework, while responsibility for implementation is transferred to a number of (relatively) autonomous regional and sectoral entities.

In the area of water resources management, de-concentration and decentralization are being implemented with the creation of Regional Water Administrations (ARAs). These agencies are responsible for the operational management of water resources within their area of jurisdiction, levying charges on bulk water abstraction and discharges to water bodies as means of funding their operating costs and investments. At present, only two out of the planned five agencies are operational – ARA-Sul (based in Maputo) and ARA-Centro (based in Beira). ARA-Zambezi (based in Tete) – is being established with the support from the European Union.

[10] This is based on the fact that the total amount of cultivated land in such holdings is about 120,000 ha (3.1% of total cultivated land), so that the agricultural value-added generated by land holdings of at least 10 ha should be of the order of 550-600 billion MT.

Among other initiatives, the ARAs are promoting the creation and development of local river basin committees, aiming to promote the organization and participation of the water users and other stakeholders in the decision-making regarding operational management of the basin water resources and in development planning. Basin Committees have a consultative role and are working regularly for the Incomati, Umbeluzi (ARA-Sul) and Pungwe (ARA-Centro) river basins. Besides the staff of the ARA, they include water users like the urban water supply companies, irrigation users (commercial companies, private farmers, smallholders associations), district administrators, hydropower producers, and Government officials (for the environment, mining, wildlife, and other sectors). The new statutes of the ARAs include at least one representative of the water users in the ARA's management council.

In the area of water supply and sanitation, the 1995 Water Policy was approved and started to implement a framework for delegated management, attracting the participation of the private sector for utility management. Under this framework, two new institutions were created: the Regulatory Commission (CRA) which is responsible for economic and other regulation of water sector systems that are under delegated management, and FIPAG, which has been set up as the body that owns the assets in urban areas that are either managed or leased by private operators. For all other urban areas as well as for the rural water supply, DNA continues to assume the leading role, until autonomous institutions can manage all systems in the medium term.

At the province level, MOPH has a local Directorate (DPOPH). Each DPOPH has a provincial Department of Water and Sanitation (DAS), the provincial equivalent of DNA. They deal mostly with rural water supply and small piped systems and also with rural sanitation, in coordination with District administration and the Health, Education and Environment sectors.

Public expenditures in the water sector. Total public expenditure in the water sector was US$15.1 million in 1999, US$28.1 million in 2000 and US$24.3 million in 2001, on average equivalent to some 0.6% of GDP. The amount funded by the government remained fairly constant, at between US$4.2 – 4.7 million each year. Total sector spending rose considerably in 2000 and 2001 because of donor financing in response to flooding. Even at its height, though, spending never reached the annual levels of between $85 and $108 million planned in the revised PARPA budget for 2002-04 (Table 8).

Government expenditures in other PARPA priority sectors were much higher. Water sector expenditures represented 2.5% of the government investment budget in 2001 (excluding donor funds), while spending in the same year on roads amounted to 19.7%, on education 12.8%, and on health 10.6%.

The water supply and sanitation sub-sector alone accounted for almost all expenditures in the water sector during 1999-2001 at 90% (US$ 13.5 million), 97% (US$ 27.2 million), and 83% (US$ 20.2 million) respectively. A disturbing feature of the data is the near equality in government spending for rural and urban services. As discussed previously, about 75% of the

total population lives in rural areas and the rural share of people without access to clean water is at least 70%. From the standpoint of directly reducing poverty, relative spending in rural areas should be much higher.

Table 8 – Revised PARPA Water Program Budget, 2002-04

Sub-sector	US$ Millions				Percent
	2002	2003	2004	Total	
Rural water supply	13.7	14.9	16.5	45.1	16.0
Rural water per capita			1.19[1]		
Urban water supply	36.0	36.3	35.0	107.3	38.2
Urban water per capita			9.33[1]		
Sanitation	2.5	2.6	2.7	7.8	2.8
Water resources	30.4	32.1	52.6	115.0	40.9
Institutional development	2.4	2.2	1.4	6.0	2.1
Total	85.0	88.1	108.1	281.2	100.0

1 – In US$ Dollars.

Charging for bulk water use. There are two tariffs for bulk water use: one of US$ 0.0020/m^3 for agriculture and one of US$ 0.0035/m^3 for urban and industry. Such tariffs are extremely low when compared with those in developed countries and even with those in middle and low income countries in the region.

Irrigation is the largest water consumer. However, raising the tariff of bulk water for irrigation has proven politically very difficult in almost all countries in the world. Some major companies using irrigation (like the sugar cane estates) are already paying for water, an initial step towards higher efficiency in water use. The cautious approach adopted by the Government seems adequate as it is preferable to have it widely applied and payments effectively collected to having a higher tariff that would simply lead to large numbers of special cases and exemptions that undermine the credibility and viability of the whole scheme.

The situation is quite different for urban and industrial water use, where the water tariff is too low and can be raised without any significant impact in terms of production costs and consumer tariffs (the raw water tariff is about 2% of the tariff for the lowest echelon of urban domestic consumers, 0.7% of the average tariff for domestic consumers and 0.45% of the tariff for industrial use). The increase in tariffs must be associated with an improvement in the level of service, to avoid resistance by utilities and consumers. Charging for bulk water also needs a system of registering and measuring abstraction. This requires a reliable registry of water use

rights, methodologies to register new users, systems to monitor actual water use and improvements in the delivery of bulk water for multiple uses.

Urban water supply. The low levels of operational efficiency in urban water supply reflect poor management and incentives, skill shortages, and the usual range of problems that afflict most publicly-operated utilities in Africa. Following the model that has been adopted in several other African cities, the operation of the water system in the 5 largest cities has been contracted out to a private operator via a lease contract for Maputo combined with a management contract for the four other cities. The intention was that the management contract should evolve into a lease or other arrangement after an initial period. However, progress in improving operational and financial performance has been slow – partly as an after-effect of the damage caused by the 2000 floods and partly because the lead partner in the private operator (Águas de Moçambique) decided to withdraw in 2002, prompting a renegotiation of the contract and a restructuring of the operator. These matters were resolved by the end of 2003 and it is hoped that better progress will be achieved from 2004 onwards. If the arrangement works, the Government intends to contract out the management of the urban water utilities for 5 more cities/towns in the medium term.

Irrigation and rural water supply. The weak link in the policy and institutional framework is the lack of clear policies for rural water management, which should encompass drought mitigation, irrigation development and rural water supply. There are individual targets, such as the rehabilitation of non-operational irrigation schemes or the expansion of rural drinking water supplies, but there is no sense of a coherent strategy towards a set of issues that are critical for a large part of the population, including most of the poor.

One reason for this problem is the division of responsibilities between Ministries (primarily MADER and MOPH). Another factor is that donor efforts, especially with respect to investments in rural drinking water schemes, have been poorly coordinated and have, therefore, failed to promote a common approach that could achieve lower costs and better sustainability of projects. A final aspect, overlaying the other two, is that this is a sphere that requires major investment, either from Government or external sources. However, the lack of domestic resources combined with the absence of a coherent strategy has meant the funds have been used opportunistically rather than with the aim of achieving specific medium or longer term goals.

The underlying difficulties will not be resolved easily or quickly. But, equally, the country has little prospect of either meeting the MDGs for water supply or poverty alleviation without a much higher level of spending on rural water supply, drought mitigation and smallholder irrigation – either via joint schemes or specific projects. A major barrier to such investments is the high level of costs exacerbated by the poor record of operational maintenance. Putting in place reliable sources of funding combined with institutional changes to promote competition and greater efficiency in the provision of rural water infrastructure will be critical elements of any policy strategy.

FISHERIES

The Ministry of Fisheries promoted in 2003 a revision of the fisheries legislation with emphasis on the *Marine Fisheries General Regulation*, which was adjusted to be more in line with the current realities of the sector. In terms of organizational structure, the separation between the political and management components, which implies the establishment of an independent control entity and the clarification of its coordinating responsibilities is the most urgent problem to be addressed.

Both industrial and semi-industrial shrimp fisheries are regulated by Total Allowable Catch together with application of Individual Catch Quota, both based on research conducted by the Fisheries Research Institute. Regulatory measures on the demersal species and large pelagics taken by the semi-industrial fleet are practically absent, except for issuance of fishing licenses.

Quota management plays an essential role in the main Mozambican fisheries, particularly in the shrimp and the tuna fisheries. In both cases the quotas, which are non-transferable, function more as a control of input (fishing effort) than control of output (catch), so they could be replaced by ordinary license fees.

Relevant scientific methods of quota setting are poorly developed in Mozambique, but the fact that positive resource rents are still being produced suggests that the quota management system is successful, despite limited knowledge to determine optimal quota. It may as well indicate that quota setting is not a critical issue in obtaining resource rent from the fishery. In any case, the critical objective is controlling effort by limiting entries, since success is due to its association with a closed season and a high growing rate.

Management of the shallow water shrimp fishery. It is hard to establish a clear relationship between stock recruitment and exploitation rate. Recruitment and growth of the main species have significant seasonal patterns, which make closed season regulation very efficient. Despite knowledge gaps in the recruitment dynamics, it seems that the explosive growth and a correspondingly high natural mortality rate combined with fresh water outflow fluctuations are much more significant factors for the species population dynamics than the fishing activity.

Catch per hour during the first month after the closed season (January and February) is 5 to 10 times bigger than the catch per hour obtained in the last months of the year. After a few months the natural mortality rate by far exceeds the individual growth and the population biomass diminishes faster than the shrimp trawlers are able to fish. The possibility of making additional profits (resource rent) thus depends on the operator's capacity of maintaining a sufficient overcapacity to take advantage of the rich fishery during the first two months after the closed season. This combined with the relatively high levels of investments required in the industry limit the successful operators to the larger ones already established – Pescamar and Efripel.

Apart from this distributive aspect, it also remains true that as long as a closed season regulation is in place, there seems to be no danger of resource depletion even in the case of extreme fishing effort. From an economic point of view however, it may be a more relevant question to ask how large the fishing capacity should be than the quota size of a total allowable catch (TAC). The quota regulation does not seem to have any important effect on total profitability. This means that other management means can concentrate on the distribution of resource rent rather than, as is the more typical fisheries case, ensure that a positive rent exists.

The priority given to the semi-industrial sector in the Master Plan combined with some lack of clarity on its definition have reduced the overall profitability of the shrimp fisheries. Quotas were assigned to new entrants not by reducing the industrial fleet participation but by increasing total participation in the fishery. The allocation procedure of new licenses was not transparent, with substantial values being transferred without clear regulation or distribution criteria, causing significant political problems which were minimized with the creation of the Ministry of Fisheries.

Even though new semi-industrial trawlers were allowed to install freezing facilities, violating the initial objectives of developing a land based processing industry, increased capacity for on shore processing has been developed over time. Quality control problems related to on shore production have been addressed and significant improvements have been obtained in this area recently. The investments in strengthening the semi-industrial sector have nonetheless allowed a land based processing industry to emerge and to professionalize the market operations in both the domestic and regional markets, even though their share of the total shrimp exports is still insignificant. Catches from local artisanal shrimp fishermen also reach regional markets and a smaller portion even the EU through local producers in Beira. These spin off effects from the emphasis put on the semi-industrial sub-sector may have been the most important achievements.

The Mozambique shrimp is a well-known quality label, and the fisheries characteristics leave room for several sub-sectors to co-exist and run profitably on the shallow water shrimp independent of each other. Such a rich resource normally attracts rent seekers at all levels where sufficient knowledge of the value and possibilities of rent harvest occur. It is however difficult to reallocate the resource rent as long as the main operators are so much more efficient both in the catch operations and in the market integration than others.

Other means to adjust profits from participating companies to normal levels would positively impact the management of the fishery. However, that will require a great deal of political ability and creativity to ensure normal profits in the long run. Presently, the fisheries administration has been focusing exclusively on the increase of rent without consideration to its distribution and impacts in terms of management. Management decisions also continue to be largely based on biological considerations, and not on systematic and empiric economic assessments.

A final relevant issue is the extreme scarcity of skilled and competent trawler crew, leading the large contingent of expatriate staff in the industrial shrimp fleet to represent a significant part of

the total costs of effort production. Today national shrimp companies hire foreign vessels because they do not have skilled personnel and vessels which can operate profitably. The market power seems to be on the foreign vessel side and consequently most of the resource rent goes on in that direction. Earlier training attempts have not been taken further and need to be revitalized.

The kapenta fishery of Cabora Bassa. As in the case of the shallow water shrimp fishery, a biologically motivated conservative approach is not appropriate. Despite the differences between the two fisheries, both have almost unique economic reasons for fisheries regulation. If a collapse in the kapenta fishery were to occur (other than by predation), it should be simple for a similar fishery to arise a few years after a new introduction because of the high turn over rate, the small investment of introducing a few hundred kapenta, and the fact that the fish could be harvested few (three-four) years after.

In the kapenta fishery the semi-industrial fleet needs to be limited if resource rent is to be obtained. The two regulatory issues in this case are: 1) to ensure a positive resource rent (by limiting entry), and 2) to decide on how to distribute the rent. For the latter, the two extremes are to take all resource rent from participants (fishermen and companies) or to leave them with all the rent. In this second case, the selection of operators becomes a regulatory issue of a political character and the major problem becomes the tendency of overinvestment by operators. The case of full government collection of the resource rent in principle simplifies the political decisions which have to be made. Under a poverty reduction perspective it may be desirable to allocate some resource rent to the employment in the artisanal sector, allowing an open access regime to coexist with the regulated semi-industrial one, but the practicalities of implementing such as scheme would have to be thoroughly analyzed beforehand.

Fishing rights. The fisheries administration has developed a number of institutions and regional offices in addition to the central administration in Maputo. The political leadership is not directly involved in decision making and day to day control of the executing bodies. This may be the historical background of the difficulties of clarifying responsibilities and introducing transparency into the decision making processes.

One of the major regulatory challenges in the fisheries sector in Mozambique are the conflicting objectives. In a labour intensive artisanal fishery, the objective of reduced rate of unemployment suggests an open access fishery, which is to a large extent the situation occurring today. Given the fishery characteristic, however, in Mozambique the major conflicts are related to the degree of impact that the industrial and semi-industrial fisheries have on the artisanal and subsistence fisheries, and not its eventual open access nature.

The shallow water shrimp fishery has been managed by TERN (until very recently) and quota regulation, which actually are done through license fees similar to a limited entry system. International access could go through a limited auction system, quotas or licenses. Since the joint venture companies were established, the Mozambican part has not been able to develop its share. On the contrary, it is being reduced and Mozambican fishermen remain very scarce in this

fishery. The role of joint ventures could therefore be questioned and more useful constructions should be considered.

The way other important resources are managed today may also be difficult to follow and could benefit from simplifying procedures. Quota management requires clear public criteria of quota distribution to ensure predictable and fair systems for users, and also to secure social benefits from natural resource exploitation. The current monitoring system is not sufficiently developed to deal with a complicated TAC regime.

Cost recovery and rent capture. It was a part of the Fisheries Sector Master Plan to achieve cost recovery for the fisheries administration by 1996. Estimates indicate that full cost recovery has been achieved if the TERN were included in the calculation. The new EU agreement has given an additional € 4 million compensation per year over a period of three years, which is at the disposal of MdP.

A fund allocation system that covers the costs of the fisheries administration is already in place, currently providing a surplus (40 percent of the license revenues) to the Ministry of Planning and Finance (MPF). Ten percent of the licenses share is allocated directly to fisheries institutions. *Fundo de Fomento Pesqueiro* (FFP), which receives and redistributes 50% of the license income, finances the rest of the operating costs of the fisheries institutions. Surprisingly, the Ministry of Fisheries claims not to have any information on the TERN (collected by MPF), although it has now apparently become a regular license fee as indicated earlier.

In terms of rent capture, Mozambique is in an unique situation of having fish resources which allow for super normal profit (resource rent) to be collected, although only a minor fraction of this rent goes back to the Mozambican government. The distribution of benefits by Emopesca, a governmental holding company, has not been possible to trace. Its net assets and shareholder funds represent nearly US$ 6 million.

Catch statistics. An effective management system must rely on the sound collection and dissemination of statistics of the sector. Catch statistics in Mozambique exist in several mutually contradictory versions, and systematized and standardized catch statistics in sub-sectors do not exist. Catches of major key species are not landed in Mozambique, giving the government less options for controlling size and composition of the catch. Shrimp is normally landed in Mozambican ports as packed and frozen products ready for export. Illegal transhipments of catches in open sea, particularly in the shrimp fishery, are known to be common practice. Freezer trawlers normally hold inspectors on board, but their action is extremely ineffective. Artisanal fishermen arrive to the trawlers in order to collect fish and other by-catch products for sale in local markets, making catch control and statistics further difficult, as they are ultimately landed along Mozambique's long coastline in ways that are essentially impossible to follow. Recorded catches are therefore supposed to cover only about one third of the total Mozambican catches.

Monitoring, Control and Surveillance (MCS). In terms of monitoring and control, a vessel monitoring satellite system (VMS) is currently set up for the shrimp industry. This is a cheap and efficient way of tracing vessel on sea and in harbour, although full implementation of the system merging received data with corresponding catch, license and other data is complex.

In the case of Mozambique it may be questioned whether the information base and the means of implementation of the monitoring, control and surveillance systems are adequate for a TAC based system. A strong biological focus to justify expensive MCS systems is dubious. Control of catch volumes is very costly and uncertain in the Mozambican context, so that a TAC based system may not be the most adequate or effective in terms of information needs and MCS. A more robust management system based on closed seasons and a combination of capacity and effort control may be more effective in terms of both limiting catch and having lower costs.

A minimum operational and sanction capacity will nonetheless always be necessary. Some steps have already been taken in this direction, but Mozambican authorities remain with little or no ability to respond to reports of illegal fishing by large industrial vessels. It is therefore necessary to develop the regional cooperation further as well as to explore the possibilities of partnerships with related sectors, such as the coast guard and navy units. Co-managed MCS is a complementary alternative also expected to lead to higher acceptance and compliance. It has already been implemented in some pilot cases in the artisanal sub-sector.

FORESTRY

The challenge of forest sector in Mozambique is to find the right set of incentives to promote forestry without using up forest resources. The government needs to capture the forest rents associated with timber exploitation without creating inefficient barriers to output expansion or promoting technical inefficiencies, while at the same time protecting the poor and preserving the ecological services. The 1999 Mozambique Forest and Wildlife Law was designed with this challenge in mind, and relies on modern forest principles and instruments.

Volume license fees and rent pricing. Recent surveys in the forestry sector in Mozambique indicate a high degree of technical inefficiency throughout the production chain, suggesting that the current rent pricing based on licensing fees may not be enough to create compatible incentives. The forest law states that both forest concessions and simple licenses can be issued independently of forest productivity. Logging companies thus tend to maximize logging volumes while benefiting from the advantages of simple licenses, bringing the forest value down.

Most of the potential forest concession areas have been allocated with contracts of up to 50 years to operators who are still carrying out forest inventories and preparing forest management plans at their own cost. These operators were granted a period of six months to finish the preparation of forest inventories and management plans as a basic condition to maintain their concession areas.

The economic literature advocates bidding as the most appropriate rent pricing mechanism, as operators reveal their maximum willingness to pay according to their expected flow of revenues and costs, allowing resource owners to capture all rent. Rent pricing through bidding fees is easier to collect, secures concession rights, and discourages rent-seeking behavior observed in administrative licensing authorizations.

Although bidding mechanisms are theoretically attractive, they require some basic conditions to ensure efficiency and administrative gains: zoning of concession areas with reliable inventories; consideration to the size and time needed to develop a sustainable logging process; participation of a sufficient number of operators to make the process competitive; an efficient and credible system of monitoring and sanction fees, which include the participation of civil society and independent bodies; adequate auctioning conditions, with the capacity to design and enforce good contracts. None of these conditions are fully met in Mozambique, so it may prudent to introduce the mechanism only gradually.

It is worth mentioning that area-related fees will face the same estimation constraints and lack of accuracy identified in the case of license fees. They can be easily calculated, but they will fail to take into account rent differentiation among species, and therefore introduce inefficiencies. Even concession fees in combination with a license fee that varies by species will in turn have the problem of setting aside what rent portion will be captured by each fee.

Incentives for wood processing. To increase value added in the forestry sector, forest regulators introduced a ban on the exporting of first-class species round wood, the leading exported wood. They also granted a 40% fee reduction for logs that are processed domestically, and a 75% reduction for two species that together account for 53% of total output. Banning log exports may not necessarily constitute an appropriate measure to promote domestic processing as it may also stimulate rent seeking and illegal exports. Some studies have suggested that the ban of log exports in tropical countries tends to depress log values and incomes by more than the value added in processing and later export.

In the early stages of setting up of the industry, subsidies can make a significant difference, particularly in a country like Mozambique, with serious domestic credit restrictions, high interest rates, and limited skilled labor and business capacity. In the long run, subsidies may become less crucial and eventually lead to the stagnation of the industrial sector. A phased-out program to gradually eliminate the subsidy in five years may be appropriate, considering the investment cycle of the sector. In terms of total tax revenues, such fee reduction may end up increasing total tax collection due to the expansion of industrial activities, employment and good circulation.

Transition to a concession regime. The objective of introducing sustainable management in the forestry sector is based on the strategy of promoting the expansion of concession systems and gradually reducing commercial logging under simple licensing. Currently, licensing can be granted either for concessions or for simple operators. Simple operators are only required to

present a simplified management plan, with information on area, volume and species. Managerial practices and exploitation planning are not required. The contribution of wood supply from simple licenses is expected to decline with the reduction of the fee waive. This could be accomplished in the next five years, for example, with a linear reduction schedule of 10% each year from 40% in 2005 and 2006, to 10% in 2009.

Simple licensing is still granted and renewed on the grounds of employment security for loggers with no capital capacity to get into concession business. Simple licenses are granted only to nationals and up to the volume of 500 m^3 per year. This production limit is expected to induce simple operators associated to processing plants to convert their operations to concession regimes. The high number of simple licensees makes monitoring too costly, reducing performance. That leads operators to use up the forest with minimum ecological and efficiency concerns.

Concessions are required to have a detailed management plan, an associated industrial plant in the concession area, as well as to negotiate with the communities living in the concession area. Although concessions are more regulated to fulfill economic and ecological goals, it is hard to evaluate how fast the transition will take place with the current quantity restrictions. Currently, at the margin output of simple operators displaces output of concessions under full compliance due to different operating costs. The dual supply structure discriminates against concessions.

As discussed previously, economic instruments such as bidding license fees or higher license fees for simple operators could speed up the transition. A faster transition, however, will certainly face strong political opposition because it will lead to serious distributive effects. It is important to note that it is the speed of the transition that may create distributive problems, and not the fee mechanisms per se.

For concession licenses, the fee reduction starts in the first year of the concession and expires five years later. The same fee declining schedule proposed for simple licensing can be applied for concessions. After the subsidy cut, operators will have an additional incentive to be efficient in order to be competitive with newcomers that will start benefiting from the fee reduction. In the long run, only up-front capital would be subsidized.

Sustainable forest management plans and ecological sustainability. Forest management plans are crucial for sustainable logging. A management plan requires a great deal of technical expertise and investments in inventory data, and both are lacking worldwide in the case of native forests. Considering the restrictions on the domestic capital market, management plans are only affordable to highly-capitalized foreign companies in Mozambique, with the result that only four management plans have been approved out of 45 authorized concessions in the period 2003-04.

Forestry regulators are taking steps to regulate the related consulting activity, which should catch up as the systems matures. However, it is not a good practice to manage concession regimes relying only on private inventories because this would exacerbate the asymmetry of information

against the regulator. Moreover, a detailed inventory and good zoning are essential to attract good quality investments.

As a consequence, the concession regime proposed by the new forestry law may not succeed to accomplish its ecological sustainability goals, as a more comprehensive concession system must be designed. Its implementation will be undoubtedly costly but given the potential market and environmental values of a sustainable logging activity, such investments on inventory could easily pay off. The problem is thus one of funding.

Intra-sector fee and tax mechanisms could play a role if earmarked for zoning activities. The revenue-raising capacity of intra-sector fee and tax mechanisms discussed in the background paper have a promising potential as summarized in the rough calculations presented below:

- License fees can be improved in their differentiation but with no significant impact in revenues even with the planned doubling fees in 2005. The idea is, in principle, to improve differentials among licensees, and not to increase total revenue. In 2003, revenue increased by 500% whereas average fee went up by a higher proportion. We conservatively assume that the proposed fee rates made an additional 50% increase in 2003 revenue value, that is, US$ 1.15 million.

- Existing fee reduction subsidy on processed log is on average 60%. Considering the 30% share of processed wood on total revenue and assuming processing losses of 50%, as exempted log is about 60,000 m^3 priced at an average fee of US$ 10 (first class wood), we estimate the total foregone revenue at US$360,000.

- A 10 year program to phase-in an export tax on precious round wood to reach a final tax level of 30% and an average effective tax (taking into account increasing rate weighted by decreasing exports) in the period of 5%. An export value of US$ 2 million would generate an additional revenue of US$ 100,000 in the ten-year program.

In sum, the expected increase in the annual fee and tax revenues raised by the forestry sector by implementing these instruments can reach at least US$ 1.6 million, and would be a significant amount to start financing zoning activities.

Finally, it is also important to note that the forest growth rate of most concession areas is below the logging needs, making management unsustainable. The forest management plans that have been returned for corrections show that operators would be mining the forests at the desired logging levels. The situation is dramatic and can only changed if certain measures are taken, such as increasing the list of commercial species and reversing the design of forest concessions, i.e., establish the concession areas only after forest inventories are ready and maximum sustainable yields estimated.

A great deal of work would be required to introduce new species in the market. The basis for the design of forest concessions, including the mechanism of estimation of sustainable yield, does currently exist, while inventory data exist for some provinces – e.g. Sofala, Zambézia, Inhambane – and could be used to start the exercise. What is critical is to make operators aware of the limited forest growth capacity and to adopt the maximum sustainable yield as the upper limit production of the concession. If higher volumes are required, then additional areas should be found or other species should be included. These measures are not trivial, but experience shows that they are possible.

The monitoring system. Forest monitoring in Mozambique faces the same weakness witnessed in economies with funding restrictions. Monitoring is decentralized to provinces, which may in principle be desirable since information costs are significantly reduced, although it may also undermine the attainment of national welfare goals, such as forest preservation.

Monitoring is very difficult to evaluate. Application of non-compliance penalties and sales of confiscated wood went up from some US$ 17,700 in 1999 to US$ 172,000 in 2003. There are significant variations in performance across regions.

Forest monitoring activities have at their disposal earmarked funding and compensation mechanisms, although the inter-ministerial decree that operationalizes the mechanism has not yet been passed. Decentralization to the provinces, the establishment of compensation schemes for the value of collected fines, and the investment made out of the reforestation surcharge lifted up the morbid situation of the forest monitoring system in Mozambique. The latter, for example, is a 15% reforestation surcharge applied to license fees, with the revenue credited to the Fund of Agricultural Development (FFA) to promote reforestation and to strengthen monitoring activities. Out of the total amount of US$ 260,000 collected in 2003, 64%, or about US$ 166,000, were applied to monitoring, infrastructure, vehicles, uniforms and training.

Another instrument has been the co-participation in penalty revenue among all individuals that have contributed to the application of the sanction, from guards to local people. A share of 50% is granted to those participants. This is undoubtedly a strong incentive to increase surveillance and curb corruption, although few provinces have actually made progress in channeling these resources for the beneficiaries. When payment occurs, distribution criteria among beneficiaries can be controversial. The province of Sofala has greatly evolved in the use of this instrument, and its experience should be interchanged with other provinces[11].

More mobile and trained monitoring is not enough. Forest regulators have little information on inventories and the accuracy of management plans. This tends to dramatically increase the

[11] Even in the provinces where monitoring has reached a good operational level, most of the activities take place in fixed check points and along the roads. Little is being done within the forest concession or the simple license logging areas in terms of minimum diameter cut and logging within the licensed area. Monitoring should improve to include observations of interaction between operators and local communities, social benefits and working conditions of employees, among other obligations of the forest operators.

asymmetry of information with concessionaires, and consequently dissipate their monitoring ability. As the concession regime expands and simple operators remain highly active, this bottleneck will become more crucial to be overcome.

Benefits to communities. Allocating a forest concession in areas where communities live is a duplication of resource ownership, so forest operators and communities can only coexist if they understand each other and work towards getting mutual benefits. Logging creates job opportunities, promotes commerce and induces better infrastructure. At the same time, loggers may compete with locals for scarce forest resources. The result is that local communities may either gain or lose from the arrival of commercial logging companies.

Community benefits are the central issue in the current forest regulation in Mozambique. Two important instruments in Forestry Regulation take into consideration communities' values: Article 102 ensures that 20% of the license fee revenue is devoted to communities living in the areas where resources are extracted; Article 36 requires concession proponents to do a public audience before an authorization is conceded. Even though the part of the license fee that goes to local communities is simple and short, access of communities to these resources is not transparent and effective, since it ends up in general budget figures.

With regard to community consultation, the process is not particularly designed for communities to bargain services from a concessionaire. While there are no linear solutions to all situations, the ability of the concessionaire and the community to negotiate potential conflicts is the basis of the bargaining process. Results of these audiences have been mixed, varying from a simple consultation with little given up to communities, to a very complex bargaining process. In the latter case operators usually end up offering significant side payments either in cash or in social investments (schools, roads, wells, etc).

In terms of earmarking, the normal situation is to have all the fees diluted in the national revenue system and not returned to communities. This situation would be detrimental for all. By directing part of the revenues to local communities, the Forest Service would be contributing for the management of forests, which would not be otherwise possible given its limited institutional capacity to carry out forest management activities.

MINING

Mineral resources are the property of the State. The Ministry of Mineral Resources and Energy (MIREME) has administrative and regulatory responsibility for minerals, with the National Directorate of Mines being responsible for licensing procedures.

The main goal of government policy for mining (Resolution 4/98 of the Counsel of Ministers) is to establish a socioeconomic environment favorable to the development of the national private sector and to attract foreign investment. The new policy shifted the role of the State from

producer to promoter and regulator, leaving the operational and implementation role to the private sector. Reforms carried out since the publication of the new mineral policy have included:

- Revision of the mining code and its regulations, attracting private investment into geological exploration and mining, and incorporating environmental provisions in coordination with MICOA;
- privatization of the state-owned enterprises, limiting State participation to ventures with prior State investment in the exploration and development of the mineral deposit. In most cases, like the Moatize coal deposits, the government is expected to substantially reduce its participation as soon as the operation is successfully rehabilitated;
- capacity development, training and creation of mechanisms for efficient supervision and monitoring of mining activities;
- support to small scale and artisanal mining, trying to bring them into the formal sector through the introduction of appropriate technologies, provision of geological services, technical support, and information related to finance, technology and management, taking into account social and environmental impacts of the activity.

The new mining cadastre. Perhaps the most significant contribution of the Mining Code to improve governance in the management of mineral resources in Mozambique was the establishment of a non discretionary and transparent system to grant, manage and cancel mining permits – the Mining Cadastre. The Cadastre was created in 2003 to enforce a simple and accessible set of regulations to promote a level playing field in the access to mineral resources by the private sector and reinforce its tenure security. Based on a "first come, first served" principle, the Cadastre grants mining licenses based on simple conditions and the payment of a fixed mining administration fee. Holding of permits depends exclusively on the payment of surface rental fees, which are proportional to the area of the title and increase every year.

Among the different parameters measuring the efficiency of the new Mining cadastre, the most significant is perhaps the number of new applications for mining titles (213 in 2004, compared to 140 in 2003, and 110in 2001), and the number of valid licenses, indicating that the level of activity has raised from 325 in 2001 to 550 in 2003[12]. Additionally, the success of the mining cadastre is clearly illustrated by the average time required to obtain a mining title. This number has dropped from 120 days in 1999 to 50 days in 2003, and it was also clearly not due to any decrease in the number of applications, rather the contrary.

By reducing the discretionary power of Government, increasing transparency, and improving security to potential investors, the new Mining Code has provided the adequate legislative and regulatory framework for promoting, regulating and monitoring large industrial activities. Its success should clearly serve as an inspiration for the management of other natural resources.

[12] At the beginning of the process, the Cadastre is naturally focused on larger operations, so the number of applications observed is significant.

The Fiscal Regime applicable to mining. The fiscal regime applicable to mining is still under revision, and is defined under the general Income Tax Code (*Imposto Sobre o Rendimento das Pessoas Colectivas - IRPC*), and is complemented in the Mining Code by two sector specific taxes: the production tax (or royalty) and the surface tax, associated with the holding of permits granted by the Mining Cadastre. Royalties are levied on the FOB export value of mineral production at a rate of 10-12% for diamonds and 3-8% for most minerals, and are deductible from taxable income. Mining companies are also subject to local government taxes.

In the case of "mega-projects" the fiscal provisions of the Mining Code usually apply to the extraction activities, while beneficiation operations have often profited from the Industrial Free Trade Zone special regime of incentives. This typically establishes a ceiling for the tax burden of these operations at 1% of net turnover. Such provision creates an additional problem for the Mozambican tax authorities, as free market prices do not exist for most of the rough raw materials coming out of the extraction operations, leaving tax collection vulnerable to the practice of "transfer pricing" between the two stages of production.

The overall mining fiscal regime in Mozambique is fair but has several structural problems that make it unattractive to private investors and uncompetitive when compared to neighboring countries producing the same type of commodities, such as South Africa or Tanzania. In response to these problems, the government has resorted in the past to special systems of exemptions and tax reductions negotiated on a case-by-case basis under the mega-projects regime or under the free-trade zones regime. The tax regime contains high royalties which can place a large burden on companies during mineral market downturns when prices are depressed, and companies have reduced profits or even losses. Moreover, the IRPC is not particularly adapted to resource rent industries, and does not take into consideration the possibilities for accumulation and carry forward of expenditures during the exploration and development phases until the first year of production, nor accelerated depreciation for these exploration and development expenditures.

While this policy has been effective in attracting foreign investment into the country, it poses specials problems. On the one side, Mozambique is not getting a fair share of the mineral rent arising from the development of its mineral resources. On the other, monitoring and compliance with these custom tailored tax regimes pose a gigantic challenge to the tax administration. Other government agencies are sometimes unwilling to implement some special provisions negotiated on a case-by-case basis under mining contract agreements (such as the exemption of import duties), which result in delays in project implementation and even disruptions in production.

Poverty reduction. The Government of Mozambique has recognized in its Poverty Reduction Strategy (PARPA) that small scale and artisanal mining have a role to play in linking sector policies with national poverty reduction goals. Because of its intensive use of manpower, it provides one of the few forms of self-employment and income generation in the rural areas.

The mining sector can contribute to poverty reduction directly and indirectly. The direct links are mainly through small scale artisanal mining which is traditionally conducted by families and entire communities off the agricultural season. It creates job opportunities for local people, encourages local businesses, and contributes to the provision of vital infrastructure for remote communities that do influence development positively, such as roads, education and health care facilities. Mining represents a source of cash revenues and contributes to assist both rural and urban populations by the continued availability of low-cost materials of mineral origin. According to household census conducted in Mozambique, mining is one of the most important sources of diversification of non farm rural incomes in the countryside.

The indirect links are mainly through supply-chain mechanisms in large mining projects. For the hundreds of micro and small enterprises that are owned primarily by Mozambicans and sold primarily to the domestic market, one possibility to overcome the severe financial constrains is to focus their core activities on developing commercial linkages with large mining companies. The other main indirect link is through government revenues, which are channeled through central governments. The challenge is to ensure the sound use of revenues for poverty alleviation at the local level, which clearly calls for a high level of transparency of payments and revenue collection.

Issues hampering benefits for the poor. Despite the government's progress with the new Mining Code facilitating access to minerals, rural farmers still face procedural difficulties when trying to secure nationally recognized legal rights to the minerals they extract. When a company is granted the legal right by the Mining Cadastre, local communities may be forced to sell all the minerals output they extract from their traditional lands or face the risk of losing access to land that may hold cultural and survival significance to them.

The government strategy to cope with this situation is to decentralize the mining cadastre's services bringing them closer to the final clients, and to provide extension services to artisanal miners, facilitating their formalization.

In the case of large mechanized investments, the regulatory framework clearly recognizes that local communities need recognition in the form of consultation processes, timely and meaningful information to base their decisions on, fair benefit sharing, and trusted grievance mechanisms that could resolve disagreements in a fair and just manner.

Because the investment climate was not conducive to the security of private investments, mining in Mozambique has seldom reached the industrial stage and has created few opportunities for substantial backward and forward linkages. Since the great majority of operations are artisanal and semi-mechanized (ASM) , the scale of the market required to develop backward linkages (equipment manufacturing, engineering and geological services, etc.) has not been yet achieved. With respect to forward linkages, cutting and polishing of both precious gemstones and ornamental stones offers the greatest potential in Mozambique.

Like in other African countries, the government of Mozambique may still be lacking stronger political commitment to formalization of the small-scale mining sector. The problem often arises from the perception that (i) a strong ASM sector may be a disincentive to attracting international mining companies; (ii) formalization implies establishing a revenue-sharing agreement with ASM areas (or at least channeling revenue back into those areas); and (iii) there are no major incentives for governments to provide state services to ASM communities which lack political influence, don't pay taxes, and are dispersed and isolated. To make it even more complicated, the ASM communities themselves are often reluctant to be legalized because it involves paying taxes that may not be reinvested into the region.

IV. MAKING BETTER USE OF ITS NATURAL RESOURCES POTENTIAL

Overall Policies

As in many other sectors, Mozambique has made substantial progress in the management of natural resources in the post-conflict period. The country has been gradually increasing the utilization of its natural resources, which can provide a platform for economic growth and for poverty alleviation. Framework laws that establish the basic ground rules for the use of resources have been enacted. These have been explicitly designed to protect the interests of the poorer Mozambicans, an accomplishment that the entire country should be proud of. However, while poverty is the key issue in Mozambique, open access to natural resources cannot be the solution. The next challenge is to implement an effective regime of secure and transparent property rights, which must respect the interests of traditional users but permits – and encourages – the more intensive development of resources. Such development will require the combination of natural resources with substantial capital investment, much of which will have to take the form of foreign investment. Hence, property rights must be seen as being secure for both local populations and foreign investors.

The Government of Mozambique will have to make some hard choices. Open access regimes and small scale shifting agriculture have not provided the basis for continued economic growth in any country in the world, and Mozambique is not likely to become an exception to this rule. Equally, there is a significant risk that rights over natural resources will become increasingly concentrated in the hands of a privileged few – perhaps consisting of joint ventures between the government and/or powerful national interests with foreign investors. Such concentration is likely to favor extensive modes of resource exploitation with low productivity and little aggregate value to benefit the country as a whole. What is required is a middle way under which effective property rights are combined with capital investment in more intensive management of natural resources that generates employment, value added and spill-over benefits for the poor and traditional resource users.

This dilemma is not exclusive to Mozambique. The government is very aware of the importance of market activities for the economy and that property rights are critical. While the ultimate ownership of resources will remain vested in the State, secure property rights can take the form of tradable user rights subject to very stable and transparent policies and regulations. This requires political determination and quite small amounts of public money to implement the regime.

Major efficiency and equity gains could be achieved in the management of the five resources by implementing better mechanisms for charging for both services and access to resources. These would be reinforced by clarifying many regulations that create uncertainty, introducing a higher degree of transparency in the system, and improving the capacity to monitor licenses. Finally it

is essential to minimize the numerous opportunities for rent seeking and corruption which seriously undermine more efficient and equitable use of natural resources.

Among the sectors examined in the study, the water sector is undoubtedly the one that requires most attention and resources. Considerable effort has been devoted to developing the elements of an improved system of governance and management of water resources. However, Mozambique has little prospect of either meeting the MDGs for water supply or poverty alleviation without a much higher level of spending on rural water supply, drought mitigation and smallholder irrigation – either via joint schemes or specific projects. A major barrier to such investments is the high level of costs exacerbated by the poor record of operational maintenance. Putting in place reliable sources of funding combined with institutional changes to promote competition and greater efficiency in the provision of rural water infrastructure will be critical elements of any policy strategy. The donor community will need in this respect to be less reticent to support investments in water management. And establishing a clear set of priorities and focusing resources will be crucial if policies and expenditures are to have any significant effect.

In addition to the increased level of spending in the water sector and making quicker improvements in the management system, the study recommendations basically aim to address the issues identified in the previous chapter.

Minimizing the gaps between written regulations and their actual implementation, avoiding unnecessary government interference, and greatly improving monitoring capacity. If government agencies do not have the capacity to monitor and enforce regulations, than the regulations should be simplified and based on positive incentives. This applies to land leases and transfers, concession contracts and licenses. Transfer and renewal of rights should be a private matter only subject to appropriate registration obligations.

Strengthening monitoring capacity is part of broader institutional development, including updating instruments and policies. Fewer resources are required compared to building heavy infrastructure, but these are activities that require time to mature and consolidate. Consolidation of the water sector institutional framework is the relatively most urgent in this respect.

In the fisheries sector, a monitoring, control and surveillance system including both inter-sector and regional perspectives should be developed also aiming to minimize governance problems. The SADC cooperation could be developed further and the possibilities of making use of other national resources (as navy and coast guard resources) should be looked into. A plan should also be developed for training Mozambican personnel in order to be independent of foreign participation for retrieving resource rent in the shallow water shrimp fishery. The scarcity of skilled Mozambicans is a major constraint to the nationalization of this fishery.

In the case of forestry, interesting monitoring and enforcement experiences of co-participation have been developed, and should be replicated both to other provinces and to other sectors. An

independent monitoring/auditing body to assure non-routine observations in the forest operations needs to be established as an initial step to improve the transparency of attribution and management of forest concessions and simple licenses.

Ensure the efficient use and equitable access to resources, even as they remain State property. The Land Law protects the rights of traditional occupiers of land and establishes a principle of community management, both essential elements of the new land regime. But, the Regulations must evolve to provide better arrangements for balancing the need for more intensive land use with the interests of those relying upon extensive shifting agriculture or livestock grazing. The ambiguities in current policies harm both traditional communities as well as the development of commercial farming. The problem is worsened by the fact that many passages of the Regulations are confusing in intention and interpretation, leaving too many opportunities for bureaucratic interference in the mechanics of the implementation.

In many respects the case of the water sector is more concerning. Substantial efficiency gains in the allocation and use of scarce public resources as well as donor funds are necessary. Public expenditures must be reallocated towards rural water supply and multipurpose water management that focuses on smallholder irrigation combined with reducing vulnerability to droughts. Such changes are viewed as critical for Mozambique to be able to approach the water MDGs. These should be complemented by measures improving information databases and warning systems that would serve both for the management of droughts as well as floods.

Improving efficiency of water systems will require investments in the rehabilitation of infrastructure. Substantial efficiency gains can also be achieved through a combination of better operational procedures and the adoption of alternative institutional arrangements including the participation of the private sector.

In the fisheries sector, conflicts in terms of access to resources have not (yet) been cause of concern, and the poorer fishermen have been enjoying open access to resources, with the activity serving well as an economic buffer. A similar situation occurs with the mining sector, although the government needs to implement policies to better integrate individuals involved in small scale and artisanal mining with the rest of the economy.

In the forestry sector, the main message is the need of a competitive shock. Growth, efficiency and social benefits can only keep increasing and preserving the country's natural basis if logging prices are correctly set. Although administrative forest rent pricing must be immediately improved to accomplish that, the medium-term goal is the introduction of a bidding license regime.

The government should actually charge and collect rents and access fees, in some cases at levels significantly higher than those nominally applied today. Land taxes should be set close to what would be the market rents payable on land in different locations and at values substantially higher than the current land tax. Abdicating rents from poor communities makes

perfect economic as well as administrative sense, but it would be realistic to charge a value of US$ 20/ha to holdings with more than 10 ha of cultivated land. Even though the revenues would not be significant, they would still be critical to discourage the holding of land in low value uses, and to induce "speculators" to bring it into cultivation or to divest of their titles to others with the necessary resources.

In the case of drinking water supply, the costs involved in achieving 90% access to piped water in all 21 main urban centers in Mozambique were estimated (chapter 2) in the order of US$ 16 million a year. Part of the costs of such a program could be raised from initial connection charges. Another should come from raising and effectively collecting an average tariff of about US$ 0.55/ m^3.

In the case of fisheries, the lack of interest in exploiting Emopesca as an instrument of Mozambican fisheries policy is particularly disturbing. After the introduction of joint venture companies in the shrimp fishery, Emopesca was the majority share holder, while today it is reduced down to 30%, with little control by the Ministry of Fisheries.

In the case of the forestry sector, even though rent prices are not too far from what appears optimum levels, revenues could and should still increase by a combination of measures including the revision of the current administrative license fee mechanism and a gradual elimination of subsidies.

Based on the numbers presented in the previous and the current sections, Table 9 below summarizes the current and potential rents from the five natural resource sectors analyzed in this study. The only two projections not discussed in the paper and specifically made for Table 9 are the increases of Fishing and Forests between 2005 and 2015. In the first case we assume that effort and production levels are already close to their optimum levels, so that the key remaining problem is basically collection (thus the difference between 2003 and 2005). In the case of forests, we propose a conservative 5% annual increase for 10 years, basically associated with increased production.

Current and Potential Rents from Natural Resource Use (US$ Million per Year, Constant Prices)

	Current Rents	Potential Rents	
	2003	2005	2015
Fishing	24	37	40
Forests	3	3	5
Mining	3	7	120
Agricultural Land	1	20	50
Water	1	15	40

TOTAL	31	82	255
As Percentage of GDP[1]	0.7%	1.5%	2.9%
As % of Tax Revenue[1]	5.3%	11.0%	19.4%

1 – Based on CEM projections.

The government should adopt more transparent procedures in every stage in the chain of natural resources management. As indicated in the previous chapter, the government should introduce all transparency measures possible in the policies and regulations of natural resources. This includes the concession of licenses and equivalent permits in all sectors, but particularly in the cases of lands and fisheries. The fisheries administration is aware of the problem and attempting to address it. But other important steps such as improving the quality and accessibility of essential data on fisheries and related activities are still needed. Data on catches and on fishing effort should be given priority and should be complemented with second hand market price data. Economic analyses of the main industrial operators are also urgently needed.

In the case of lands, the rights to large tracts of land are given without a stricter mechanism of verification of the true interests and capacities of proponents to actually develop such lands. The mechanisms by which they negotiate with communities is also often untransparent, and would be far worse if it were not for the strong presence of NGOs and other groups that support poor communities. Dissemination of associated data and general information, including the cadastre of land, land rights, land transfers, and land payments are also crucial under a system of public ownership of the resource.

In the case of mining, the Mining Cadastre was a major step forward to improve governance in the management of mineral resources, establishing of a non discretionary and transparent system to manage mining permits. This increased transparency and improved security to potential investors and its success should clearly serve as an inspiration for the management of other natural resources. The sector however continues to be confronted with governance issues in terms of integrating small-scale and artisanal mining into the formal economy, and with the management of revenues arising from large industrial mining projects.

Sector Recommendations

LAND

The crucial issue is to get the balance between the community and commercial farming sectors right in structuring access to and payments for land. The challenge is that agriculture has to become more capital-intensive if economic growth within the small farm sector is to be sustained. Nowhere in the world has shifting agriculture provided the basis for continued economic growth and Mozambique is not likely to become an exception to this rule.

Efforts to promote capital investment in settled agriculture will probably face resistance because of misperceptions about potential impacts and political intentions. New policies should be based on positive incentives rather than coercion. The key elements of a land strategy designed to reconcile, as far as possible, the interests of small and commercial farming should include:

Privatization. For the next 10-20 years debates about the "privatization" of rural land are a time-wasting red herring. Secure leasehold titles provide all the security that is needed by commercial farmers. The problem with the current system is not the lack of freehold land ownership, but the scope for bureaucratic interference – creating opportunities for corruption and rent-seeking behavior – when people seek to transfer land titles. Such interference needs to be removed, allowing transfers to be entirely a private matter subject registration at the National Land Registry.

Land titles. Under the current law land titles can only be renewed once, and this may have a longer term impact on investment in land improvement. Renewal of a title for a further period of 50 years should be automatic, without bureaucratic interference, provided that the leaseholder has complied with the provisions of the lease and is willing to pay the appropriate renewal premium. The issue of private ownership cannot be deferred indefinitely but certainty over the renewal of leases would remove any need to address the issue in the next 30 or 40 years.

Development plans for the land. The requirement that potential lessees propose and implement a development plan for the land is theoretically understandable, but the government does not have the resources to check the validity of and subsequent compliance with development plans for commercial – let alone family or community – agricultural land throughout the country. There should be a distinction between (a) leases that are awarded without any conditions concerning development (almost all of the land), and (b) land with leases on privileged terms subject to conditions on development that can be monitored and enforced. These should be restricted to circumstances where clear economic and/or social reasons justify ensuring consistency with some set of public goals supported by public investment. An obvious example is irrigated land where the government wishes to ensure that complementary investments are made by farmers to make appropriate use of the irrigation capacity.

The background paper on land provides detailed recommendations on specific provisions of the Land Law Regulations along the lines above. One important example is disallowing applications for renewal of a land title prior to 12 months before it expires: this simply ensures that investment decisions will be blighted for many years prior to the expiry of a lease. Imposing a fine for an early application merely exacerbates the point. Another regards the award of Provisional Authorizations for land use – effectively a temporary title that can be revoked if the development plan has not been implemented "without justification". This gives excessive discretion to various authorities to make such judgement and exposes investors to significant risk of expropriation.

Land taxes. For commercial farming the normal terms should be adjusted to offset any incentive to hold land without making the investments required to develop it. The lessee should pay a substantially higher rent or land tax for land held on normal lease terms. The current structure of land taxes is far too complex and provides unwarranted incentives for cattle and game ranching. The level of land taxes should be set close to what would be the market rents payable on land in different locations and suitable for different types of use. Some provisions, detailed in the background paper, include:

- Increase the basic level of the land tax for agricultural land by 10 times (to MT 300,000, about US$ 12 per ha);
- Eliminate multipliers for Development Zones, Partial Protection Zones and land holdings in excess of 100 ha;
- Discontinue the discount on land used for permanent crops, since it should compete on level terms with other types of arable and livestock farming;
- Develop a specific study to identify a feasible and effective way to establish the land taxes for livestock and wildlife ranching.

Taxes for commercial farms. A clear distinction between commercial farms, which are required to pay land taxes, and land held by communities and small farmers needs to be made. Holders of land titles of less than either 5 or 10 ha of land outside urban areas should be exempt from payment of land taxes. But a blanket exemption would create an incentive for communities to lay claim to areas for shifting agriculture, undermining the broader policy of promoting investment in settled agriculture. Although this has not yet occurred, the amount of land that a community can register title without payment of the tax should be limited to some reasonable per capita or family average.

If an average tax of MT 300,000 per ha were imposed on all cultivated land above 5 ha per holding, the total tax revenue would be about MT 195 billion. This is much higher than the revenue at present but is still barely more than 1% of agricultural value-added. Extending coverage of the tax to land used for grazing in mixed farming systems might increase the total revenue to MT 285 billion. A little more than US$10 million in land tax revenue is not large, but it would establish a clear principle that land taxes must be paid on land leased from the government in lieu of rent. Some earmarking might be justified to help upgrade the land titling management system or to fund specific agricultural programs.

Transitional relief. The adoption of much higher land taxes may be resisted on the grounds that this undermines the basis on which existing lessees have taken out their titles. On the other hand, the change would be accompanied by less onerous conditions with respect to the implementation of development plans. It may be appropriate to grant some kind of transitional relief to titleholders that have made good faith efforts to move forward with their development plans. This relief could include two elements:

- Existing lessees could be permitted to hand back a proportion of the land for which they have title without charge within a period of 5 years (period during which development plans were supposed to be implemented under the Regulations to the Land Law);
- the higher land taxes could be phased in over a period of three or four years for those with leases granted prior to, for example, 2006. This would give time for any lessee with a serious intention of developing land to complete the investments and commence farming activities necessary to earn the return on land that would cover land taxes.

Penalties and enforcement. Monitoring and enforcement of land tax payments and development program obligations is very weak, except perhaps when the titleholder wishes to transfer the title. This creates an incentive for covert transfers, reinforcing a general sense that land titles are neither a reliable guide to who controls land nor a secure claim on the right to use it. Establishing an effective monitoring and enforcement system is thus an important complementary measure to the simplification of provisions concerning the transfer of land titles. The government could rely on the consultative councils of the districts, as suggested in the Agenda 2025 and in the RAP 2004 of the G20 to the Poverty Observatory.

The reluctance to enforce payment of land taxes because titleholders may not afford to pay these taxes while implementing development programs is unacceptable: the payment of land taxes of even US$ 12.50 per ha will have no material impact on investments that are likely to amount to at least US$ 1,000 per ha – and may be much higher. The failure to charge simply encourages the holding of land for speculative purposes rather than for agricultural investment.

Sub-division of regular land titles. It is essential to provide a mechanism by which plots of land can be sub-divided in response either to changing economic circumstances or as a mechanism by which improvements on one part of a land holding can be mortgaged in order to finance capital investments in unimproved. The Regulations mention the possibility of joint title holders (*co-titulariedade*) and that any kind of sub-division should follow the rules established by the Commercial Code. The intention is to permit some form of sub-lease mechanism under which sub-division is possible via the creation of sub-tenancies, subject to the conditions of the master ground lease. Experience in other countries suggests that such arrangements can work so long as there is an effective and reliable legal and judicial system for dealing with commercial disputes over (sub-)leases. Under current circumstances in Mozambique, it may be preferable to consider alternative mechanisms for the sub-division of titles.

Summary. The Land Law was conceived and approved at the parliament as a framework law (*Lei Quadro*). The intention was to add new regulations whenever required by the development process. In many respects the new land regime established under the law has been a success: agricultural product in the country has been increasing, investments are being attracted, there are no landless peasants and no tenants are paying rents to absentee landlords, as observed in many other African Countries since the 90s. Despite such achievements, progress

could still be accelerated by addressing two main issues: (i) the fact that the Law and Regulations have many passages which are often confusing in intention and interpretation, leaving too many opportunities for bureaucratic interference in the mechanics of the implementation (reinforcing the principle that the devil is in the details); and (ii) an urgent need for a more coherent tax system on the lands leased by the State.

The first problem may be a symptom of an over-stretched bureaucracy struggling to deal with a contentious and technically difficult set of legal issues. However, ambiguities and poor drafting may reflect a desire to retain political and bureaucratic discretion on matters that are very important to investors and different interest groups. The mechanics of land policy have not received sufficient attention throughout the Southern Africa region. The compromise between the advocates of community-based land tenure and those wishing to promote the development of more capital-intensive commercial farming, as envisaged in the 1997 Law, has been working much less well in practice than in theory: too much time has been spent on issues concerning the distribution of land resources and too little on the efficient administration of those resources, given the distribution that has been settled.

With regard to the second issue, the paper suggests that there appears to prevail a basic confusion between land rents and land taxes in Mozambique. Since in Mozambique all land is state property, there is absolutely no reason for the profits made by the initial occupiers to be exempt from payment of some amount in lieu of rent. Future occupiers will build this expectation into their decisions regarding how much land to occupy and how much to invest in improvements. The purpose of implementing such a payment is not the collection of revenue, but the creation of a framework to ensure that public land is used in a more efficient and equitable manner.

WATER

Water is clearly essential for poverty reduction and improvement of quality of life in Mozambique. If the country is determined to reduce its poverty indicators and to reach the MDGs, it should place a great deal of emphasis on the sound management and use of its water resources, focusing, primarily, on the provision of improved water supplies to the rural population and to poor groups in urban areas. Additionally, Mozambique needs to expand it provision of water for smallholder subsistence irrigation and commercial agriculture, and reduce its vulnerability to droughts.

These are enormous challenges for a poor African country. Pursuing these goals will require substantial efficiency gains in the allocation and use of scarce public resources as well as donor funds. It will also require an increase in the historic average spending figures for water supply and water resources management. In addition, public expenditures must be reallocated towards (a) rural water supply (provided that costs are brought down), and (b) multipurpose water management that focuses on smallholder irrigation combined with reducing vulnerability to

droughts. Without such changes it is unrealistic to think that Mozambique will be able to approach the MDGs.

This effort will also require adoption of new or more appropriate technologies, expanding the menu of options and instruments currently available to the GoM, promoting increased participation by society, the private sector and NGOs, and the increased collaboration with neighboring countries. The donor community also needs to be less reticent to support investments in water management which are obviously necessary but that often raise concerns about social and environmental impacts. In this category the need to progressively increase Mozambique's capacity to stabilize its water supplies and to reduce its vulnerability to floods and droughts through the implementation of both large and small dams is especially important.

Considerable effort has been devoted to developing the elements of an improved system of governance and management of water resources. The approval of the National Water Law in 1991 and the subsequent adoption of the National Water Policy in 1995 were some major steps forward. Similarly, the approval of a new legal framework for delegated management was developed allowing for the involvement of the private sector in the provision of water supply services in nine major urban areas. This also involved the creation of a parastatal asset holder agency – FIPAG – and a regulator – CRA. However, the implementation of this framework has suffered some setbacks and has been slower that intended.

Mozambique does not have the financial or institutional capacity to pursue a broad range of goals within the water sector, especially across the whole country. Establishing a clear set of priorities and focusing resources on these is essential if policies and expenditures are to have any significant effect. Core elements of a program based on such priorities should include:

Existing hydraulic infrastructure. In general the efficiency of water resources systems is very low. This is primarily due to deferred maintenance and deficient operation. While improving efficiency of water systems will require investments in the rehabilitation of infrastructure, substantial efficiency gains can also be achieved through a combination of better operational procedures – such as the revision of O&M rules and schedules - and the adoption of alternative institutional arrangements including the participation of the private sector through maintenance and management contracts, etc. Efficiency gains can also contribute to addressing serious equity issues, since those at the tail end of networks, usually the poor, suffer most from system failures.

Water supplies to the rural population. A major barrier to expanding access to clean water in rural areas is the high costs of drilling boreholes and installing pumps. Poor design, the lack of spare parts and the neglect of maintenance mean that too many of the water sources that have been provided do not operate properly. As an alternative route to lower costs the GoM should also consider options based on rainwater harvesting, which are successfully used in places such North-East Brazil.

It is essential to encourage competition in drilling services and to organize investment programs in a way that minimizes the costs of providing new water sources. The cost penalty seems much too large relative to other countries in Southern Africa. Where feasible, lower cost alternatives such as rain harvesting systems, hand dug wells, etc should be considered. Also, the implementation of new systems should be demand driven, continuing with the policy that the country adopted for the past years, where there is stronger interest and commitment on the part of local populations to maintain new systems. Donor agencies and NGOs should coordinate their efforts, both as a means of reducing costs and in order to develop capacity at local level, both in villages and districts.

The performance of small piped water systems is poor with most of them not operating after a few years. The costs of rehabilitating or constructing these schemes are much higher than borehole supplies[13]. These differences suggest that the GoM should consider the rehabilitation and expansion of these systems only when unit costs of investments are not too high (say, not more than US$50 per capita), when the technical and financial sustainability is ensured for O&M, management is taken by an autonomous entity operating on commercial principles, and there is a clear commitment of the local authorities.

It is important to stress the need for ensuring that sufficient funds are available to cover O & M expenses and that systems are properly maintained. Less than 40% of small town piped systems appeared to be operational in 2001. It is extraordinarily wasteful to install piped water systems that are not properly maintained, but equally there is an opportunity to make a significant step of improving coverage by rehabilitating non-operational systems. It is also believed that at least one-third of village sources are non-operational or face serious operational problems due to either to lack of spares and maintenance or reliance upon seasonal water sources that dry out or become inaccessible during periods of drought. Thus, it is essential that any increased program of capital expenditure should be accompanied by mechanisms designed to ensure that proper provision are made to cover O & M expenses and to ensure that spare part, etc are available as required.

Water supplies to urban populations. In chapter 2 a simple exercise to estimate the costs involved in achieving 90% access to piped water in all 21 main urban centers in Mozambique suggested that they were in the order of US$ 15- 20 million a year. An investment program of this scale could easily be financed, provided that the utilities charge tariffs that are designed to cover the full costs of service. A part of the cost of the program could be raised from initial connection charges. Such charges are undesirable in the longer term since they can be a barrier to achieving high coverage levels in poor areas. However, with such a low starting base and clear evidence of excess demand for connections it would reasonable to levy a connection charge of, say, US$ 200 to cover the direct cost of new connections.

[13] The Sustainable Water Project in Nampula estimated the capital cost of rehabilitation and expansion of eleven small town schemes to range between US$ 100 and over US$ 1000 per domestic connection, an average of US$511 per domestic connection or around US$85 per capita.

To cover capital costs of US$ 500 per connection, it would be necessary to charge an additional US$ 0.30-0.35 per m^3 of water invoiced, implying an average tariff of about US$ 0.55/ m^3. This figure is at the bottom end of the range of US$ 0.55 to 0.70 per m^3 for full cost recovery tariffs estimated by FIPAG and CRA. The average price actually paid per cubic meter by domestic consumers in 2001 was US$ 0.38/ m^3 – US$ 0.23/ m^3 for those with domestic connections, US$ 0.53/m^3 for those who purchase water from public standpipes, and US$ 0.77 m^3 for water coming form privately run standpipes. This corresponds to a familiar pattern that households with domestic connections pay much lower average prices, though for larger amounts of water.

Surveys of willingness to pay for water in poor countries consistently show that urban households are willing to pay more than US$ 0.50 per m^3 for piped water. Thus, with an initial connection charge of US$ 200 plus an average tariff of US$ 0.50 per m^3 it should be possible to finance an investment program to extend networks to serve 90% of the urban population within 10 years. This tariff would be slightly higher than the National Tariff Policy guideline, which is however based on too conservative assumptions as explained earlier in the text: a minimum charge of US$ 3.50-4 per month for up to 8 or 10 m^3 should be manageable.

Ideally, almost all urban consumers would receive service through private connections, but a period of at least two decades will be required to get close to that goal in Mozambique. Hence, standpipes will play an important part in urban water supply provision in the poorer areas of Mozambique's towns and cities for a decade or more. Since the poor are especially dependent on standpipes, the improvement of standpipe service would make an important contribution to urban poverty alleviation and should be given high priority, as already recognized by FIPAG.

The record of managing urban standpipes in Mozambique is poor. It is reported that no more than one-fifth function properly. This is a common pattern in many cities in Asia and Africa where standpipes are operated by municipal or public utilities, which typically have no incentive or resources to ensure that standpipes are maintained and operated properly. The response in other countries has been two-fold. Either (a) standpipes are transferred to community organisations (church groups, local NGOs, etc) which take on the responsibility of operating and maintaining them, or (b) standpipes are franchised to private operators, who compete with local water vendors. In both cases the operator pays a bulk water tariff for the water used (of the order of 50% of the normal volumetric tariff) and can choose to charge for water consumption by the bucket or as a lump sum for a certain level of usage.

Experience shows that both types of arrangement can work well in many African cities and provide a framework for ensuring that standpipes do not remain a neglected and unhygienic way of supplying water to poor households. There have been limited experiments in Mozambique – notably in Tete and Angoche – with both models and these should be extended more widely in other towns and cities. Where the management and operation of water utilities is transferred to the private sector, it is also important to ensure that they have proper incentives to maintain and extend the network of standpipes. Appropriate provisions are being included in management contracts and similar arrangements for private participation in water services in South and South-

East Asia. This should be addressed when the existing arrangements in Mozambique are reviewed or extended.

Given the rate of urban population growth and the existing level of urban water coverage, there is no realistic prospect of getting close to 90% coverage (or better) within the next two decades if policy were to focus exclusively on providing household connections, i.e. house or yard taps. Even if standpipes are an interim and not entirely satisfactory solution, nonetheless they provide a route to ensuring that almost all of the urban population has access to some form of piped water supply within a few years. The alternative will be to leave several million urban residents without any access to clean drinking water, relying either on unprotected – and almost certainly contaminated – sources or on buying water from vendors at a much higher cost than would be involved in serving them via standpipes.

Water for irrigation. Government programs should focus on the provision of irrigation water for smallholder farming. The classical dilemma between supporting subsistence agriculture versus commercially oriented agriculture (employment for the poor) is particularly difficult to address in Mozambique. A strategy for the development of irrigation should focus on two main pillars: (i) rehabilitation and implementation of smallholder irrigation projects with a strong initial emphasis on food security and poverty reduction; and (ii) rehabilitation of existing and implementation of new irrigation schemes for commercial farming, including sugar estates.

In a context of limited water storage capacity, lack of adequate policies, and lack of financial resources, the best use of public resources would be to concentrate on improving conditions for smallholder farming. This includes the provision of irrigation water from low cost schemes for water management rather than large projects, supported with technical assistance and basic inputs (e.g. seeds).

The strategy should be realistic in terms of targets and potential sources of financing. Attention should be concentrated on the best located and least expensive sites, rather than large capital-intensive schemes. For reasons of controlling risks and mobilizing the necessary investment resources, the private sector is likely to be much more interested in small or medium-sized schemes rather than the larger projects that tend to attract international donor interest. Hence, irrigation in the Zambezi, Punge, Buzi, Limpopo and Incomati basins is likely to be most attractive for commercial farmers, since the irrigation systems would rely primarily upon diverting water from rivers and small dams.

There is substantial potential for the expansion of commercial irrigation, but this should be driven by the private sector. The role of the GoM should be to put in place – and support – the legal, institutional and regulatory framework that will be required to permit the expansion of commercial irrigation. Some support for the development of water storage infrastructure may be warranted when this is linked to multi-purpose projects through energy production, water supply, transport, or drought management. Private-public partnerships should also be considered, for example with the Government providing funds for storage works and rehabilitation of irrigation

infrastructure and the private sector reserving part of the irrigated area (10% for example) for small farmers and giving them support for production and commercialization.

If commercial and smallholder irrigation are to contribute to long term agricultural growth, Mozambique has to promote investment not only in irrigation infrastructure but also in complementary activities ranging from transport to export processing and marketing[14]. Irrigation is only one element in a larger package that is currently hindered by all of the issues of the business environment. Without the market environment and infrastructure that meets the needs of commercial agriculture, there will not be the skills, processing plants, etc required for smallholders to make the transition to higher value-added activities.

In Mozambique, public resources should be concentrated on small farming, whether rain-fed or irrigated. But this leaves a large role for private investment in commercial medium-scale irrigation projects. The Government must put in place the institutional arrangements and commitment to ensure that such investments are seen as being secure without engendering conflicts between the advocates of more capital-intensive farming and those seeking to defend the position of and opportunities for small farmers.

Reducing vulnerability and building dams. The GoM could make significant progress in reducing vulnerability to droughts by dealing with issues related to rural water supply, irrigation water for smallholder farming, and the O&M of existing systems. This could be complemented by measures improving the information database, including with upstream riparians, and warning systems that would serve both for the management of droughts as well as floods. Small dams and reservoirs should be built throughout the country in the most drought-prone areas.

Storage reservoirs are certainly the most controversial of all structural measures, especially in light of potential environmental and social impacts. Dams can contribute to the attenuation of floods but they can also aggravate the effects of floods if not well maintained and/or operated properly. Two major dams have been identified as being absolutely needed – Moamba Major, for the water supply of Maputo, and Bué Maria, for the water supply of Beira and for the large irrigation developments being considered for the Lower Pungoé. Medium size dams are also required in the short to medium term to ensure the water supply to cities like Nampula, Nacala, Quelimane and Lichinga. This will be a major effort for the GoM and it will require a strong support from the donor community.

[14] Managing the risks of market development is also a critical issue. Investment in sugarcane irrigation, estates and mills to expand commercial production is a heavy commitment, while the world market is notoriously volatile. The Government should not promote such investments unless it is able to attract private partners willing to share the risks. Similar considerations apply to the development of commercial and smallholder schemes focusing on crops such as citrus, tobacco, tomatoes, other vegetables and fruit that have substantial processing or marketing requirements.

In addition to the building of dams, operating rules for all the existing dams should be reviewed and adjusted to current needs in terms of flood attenuation as well as other uses. It is clear, however, that storage capacity in Mozambique is very low, particularly if it is considered that Cahora Bassa represents the larger share of all storage capacity. Therefore, the implementation of new dams is considered a prime objective for flood control as well as for the mitigation of the impacts of droughts. The implementation of new dams would ideally need to be justified for multiple uses. As most floods originate in upstream countries, Mozambique will have to continue to work with upstream riparian to ensure that operation of upstream reservoirs does not contribute to aggravating floods in its territory.

Implementing the legal, institutional and regulatory framework. This will involve capacity development, institutional strengthening, and the development of water resources management tools such as basin plans, mapping, contingency plans, etc. Fewer resources are required than for implementing the other priorities, but these are activities that require time to mature and consolidate. By continuing to strengthen the overall framework for the water sector, the GoM can reinforce the effectiveness of its policies in linked sectors and its efforts to meet its priorities within the water sector.

FISHERIES

Given the economic and social importance of the sector, Mozambique has been making steady and significant progress in the management of its fisheries resources. While the management system contains the instruments and approaches successfully adopted in many OECD and other developing countries, major gaps and inconsistencies remain in the body of laws and regulations. The government is largely aware of these problems, and should be more determined to address them more quickly if it does not want to seriously threaten one of its most precious resources.

As in most developing countries, the basis of the fisheries regulation in Mozambique is biologically motivated, where a biological calculation of correct quota values are emphasized. This reflects a current understanding and explains the development of a management structure that fails to address many of the most important problems of fisheries. The fisheries policy needs to be based on clear and consistent economic objectives. These objectives need to be in line with the overall objective of poverty reduction. In this respect, the Mozambican fisheries management needs to go through a full evaluation of the specific motivation behind each management instrument adopted, since in several cases it is difficult to discover the connection between policy objectives and the choice of management instruments.

Data. There is an urgent need for improving the quality and accessibility of essential data on fisheries and related activities. Data on catches and on fishing effort should be given priority and should be complemented with second hand market price data. Economic analyses of the main industrial operators are also direly needed. While some investment may be necessary to

acquire, organize and make best use of available data, poor dissemination of available information may be a disturbing sign of poor use, manipulation and un-transparent management of what is available.

The financial flows within the fishing sector, the governmental institutions, foreign aid agencies and NGOs should be analyzed and evaluated in the light of identified political objectives in order to ensure consistency and coherence, and to provide transparency and useful information for all decision makers in the sector.

Regulation. The Mozambican fisheries management needs to go through a full evaluation of the specific motivation behind each management instrument implemented. In several cases it is difficult to discover the connection between policy objectives and the choice of management instruments, which often seem to be more based on traditional thinking than on efficient removal of market failures.

The fishery policy needs to be based on clear and consistent political objectives. These objectives need to be in line with the overall objective of poverty reduction. Regulation has to be validated through identification of one or both types of market failure discussed in the document. The use of fiscal instruments (license fees, industrial policy mechanisms, etc.) should be evaluated together with other management instruments. As in most developing countries, the basis of regulation in Mozambique is biologically motivated, where a biological calculation of correct quota values are emphasised. This reflects the current understanding and explains the development of a management structure not addressing the actual problems of fisheries.

Licenses and concessions are granted under very un-transparent procedures. This is a problem acknowledged even by the fisheries administration. The lack of clear criteria for quota distribution is considered by the Ministry itself as a major problem which presently is being looked at. These criteria, as the management instruments, need to be consistent with the political objectives of the sector. The problem of licensing and quota distribution goes however beyond the distribution issue alone, as the fundamental reasoning behind the allocation of fishing rights also needs to be analyzed.

The Ministry of Fisheries expresses a willingness of implementing more transparent procedures as this will simplify routines and responsibilities and make the situation easier for the administration. One main problem seems to be lack of competence and capability for doing this. Another problem is the fragile balance obtained with the many interests involved, which makes any change difficult and only possible with a high degree of political authority, which does not seem to be developed at this stage.

Resource rent is obviously obtained by major operators and are leaking out of Mozambique even though market solutions such as licenses or quota auctions could be used to retrieve at least some of the resource rent. It would however be necessary to thoroughly analyze possible negative consequences caused by asymmetric information and financial conditions. The joint venture

companies are largely controlled by foreign companies, which are the actual operators, with significant revenues being lost if not abdicated. A key issue is to develop a national Mozambican capacity of exploiting its own fish resources in a profitable way, and reviewing the use of Emopesca as a governmental control instrument. The lack of interest in exploiting Emopesca as an instrument of Mozambican fisheries policy is particularly disturbing. After the introduction of joint venture companies in the shrimp fishery, Emopesca was the majority share holder, while today it is reduced down to 30%, with little control by the Ministry of Fisheries. Hopefully this reflects lack of capacity and competence in the ministry, and not serious problems poor government management and corruption.

Poverty alleviation. The Mozambican fish resources have undoubtedly been playing an essential role as a poverty reducing economic buffer. General community development has also been initiated as parts of fisheries development (for example by IDPPE). It is however important to keep this dynamic perspective also in the future development of the small scale fisheries. When it comes to the industrial sector it is more relevant to focus on resource rent production and flow. As discussed above, only a minor share of the total resource rent production is kept in Mozambique, and consequently not benefiting poor Mozambicans.

The role of fish resources as an economic buffer in a situation of poverty and unemployment should be acknowledged and understood so that this buffer is not undermined or deteriorated by improper management or other governmental interventions. Open access may be a useful approach in several coastal artisanal fisheries in this perspective.

Poverty reducing actions and development within the fishing communities along the Mozambican coast, lakes and dams, should not target fishing and related activities alone, for example by giving financial advantages to these specific activities. Government interventions on different sectors should be integrated in order to ensure sound and sustainable communities based on the natural favourable conditions, and avoid overinvestment in the fishing sector.

Monitoring. Regulations and policies are made under the assumption that the institutional capacity of government to monitor and enforce is very good. This would be crucial in a system where all resources belong to the State. Control is currently very weak and Mozambican MCS capability is poorly developed. A strengthened MCS capability is needed, although it defines per se a new area of possible rent seeking, side payments and corruption. The development of a MCS system including both inter-sector and regional perspectives should be developed also aiming to minimise these governance problems. The SADC cooperation could be developed further and the possibilities of making use of other national resources (as navy and coast guard resources) should be looked into. Resource monitoring needs be carried out also in cases of open access fishery.

Training. A plan should be developed for training Mozambican personnel in order to be independent of foreign participation for retrieving resource rent in the shallow water shrimp

fishery. The scarcity of skilled Mozambicans is a major constraint in the nationalization of this fishery.

FORESTRY

Enormous regulatory efforts in forestry have already been made in Mozambique, not only in terms of legislation, but also in implementation and analytical work. While recent progress has been notorious, further adjustments are still needed and several official studies have already pointed them out. This study's recommendations are much in line with them.

The main message is that the forestry sector in Mozambique needs a competitive shock. Growth, efficiency and social benefits can only keep increasing and preserving the country's natural basis if logging prices are correctly set. Although administrative forest rent pricing must be immediately improved to accomplish that, the medium-term goal is the introduction of a bidding license regime. Such an enterprise is the natural next step to be taken to attain the goals foreseen in the new forestry policy. Considering the initial stage of forestry regulation and its institutional basis in Mozambique, a gradual approach is suggested for a bidding license fee, which has to be preceded by other important adjustments in the current instruments. The study's main recommendations are the following:

Zoning. Develop a program for implementing a zoning system of logging areas based on detailed inventories, optimal exploitation sizes, and indicators of social conflict. This is the most important first step to set basis for introducing bidding license mechanisms, sustainable management, efficient productive practices, effective monitoring, and fair resolution of conflicts with communities. Rough calculations indicate that the proposed fee and tax mechanisms could generate an increase in annual revenues of at least US$ 1.6 million. This is a significant amount that can be very effective if earmarked to finance zoning activities with immediate positive results.

License fees. The increase in revenues indicated above would have to rely on the revision of the current administrative license fee mechanism and a gradual elimination of subsidies.

- Designing the volume license fee[15]. The current administrative license fee mechanisms should be revised to capture windfall profits and inefficiency losses. It is possible to immediately introduce a license fee mechanism that evolves over time in

[15] The background paper for the forestry sector presents a simple and transparent methodology for improving the current volume fee. The basic formula is $R_i = p_i - [(1+\beta_{ij}) - AE_j - EL_j]\ AC_{ij}$, where R is the rent, i is the wood species exploited by the j operator, AC is the country's average exploitation costs, β is the elasticity of the marginal cost curve, AE is the accessibility externality rent as a percentage of AC, and EL is the efficiency losses as a percentage of AC. The paper presents estimation procedures for the various parameters.

line with species prices and adjusts for operator's accessibility factors and logging efficiency.

Rent pricing can (and should) differentiate by class, as current fees do, but also take into account location variables that also affect rent. Moreover, in accounting for efficiency levels, it should create incentives for better managerial and technical practices. It should additionally set periodical revisions of rent values. Application of such a pricing method should give incentives for operators to move to remote areas, reducing concentration around urban centers and overexploited forests, would penalize more the operators making windfall profits with the current fee system, and should induce inefficient operators to adopt more efficient processes. Application of higher fee rates and, later on, of bidding mechanisms, should also apply to simple licensing to speed up the transition to the full concession regime for commercial logging.

It has been argued, however, that the forest regulation is killing national forest operators in favour of the expatriate investors. The Forest Service should evaluate the political and social consequences of the market economy that the procedures recommended above may generate, including the necessary incentives to help build/strengthen a local (national) industry.

- Phasing out the fee reduction. The current 40% fee reduction for processed log is not dynamically efficient. This fee reduction must be seen as temporary subsidy and a phased out program must be designed and fully publicized among beneficiaries.

Bidding mechanisms. As indicated in the previous chapter, the economic literature suggests that bidding mechanisms are the most appropriate rent pricing mechanism, and its various theoretical and practical advantages discussed, together with required basic conditions to ensure efficiency and administrative gains. A realistic program to gradually introduce bidding mechanisms should incorporate the following basic principles: an increased control of efficiency of the forest concessions (since most of the areas have already been requested, it will be discouraging for companies to disregard their forest inventories and the management plans to start a biding process); the Forest Service should ensure that the basic premises of forest concessions are met, particularly timber stock and forest productivity; the role and the responsibility of the Forest Service and the forest operators should be clarified, in particular the Forest Service has to increase the quality of information of the concession areas and reduce the asymmetry of information, which is presently in favor of the concessionaire.

Other instruments. Other measures that would help the implementation of policies of the forestry sector in Mozambique include:

- Rebate the 15% reforestation surcharge for forest concessions that show silvicultural treatments to promote future yields, in order to promote sustainable forest management activities.

- Speed up of the definition of the principles to apply to domestic forestry certification and actions to motivate international organizations to assist with implementation of the system.

- Establish an independent monitoring/auditing body to assure non-routine observations in the forest operations as an initial step to improve the transparency of attribution and management of forest concessions and simple licenses.

- Speed up the approval and implementation of revenue sharing mechanisms for community benefit as well as for monitoring authorities, with the objective of complying with the social objective of the forest regulation and ensuring a more effective monitoring system.

- Set up of projects for the creation of industrial zones and clusters for wood processing facilities combined with fiscal incentives and matching grants for P&D and staff training.

Overall, the main challenge is the transition to a concession regime with bidding licensing fees. Their implementation will require a great deal of institutional and technical efforts and, above all, strong financial support. By not pursuing these changes, the country may be abdicating forest values to future generations. How valuable are these inter-temporal losses compared to poverty alleviation and epidemiological programs, also competing for the same budgetary resources, is a matter of policy decision to be based on equity considerations.

MINING

The government has made significant progress in the regulatory framework of the mining sector. The new cadastre has introduced a much higher degree of transparency and, perhaps not surprisingly, has promoted new investment and a significant expansion of the activities in the sector. In spite of the overall improvement in the legal and regulatory framework, the mining sector in Mozambique continues to be confronted with governance issues at least in two areas : (i) integration of small-scale and artisanal mining into the formal economy; and (ii) the overall tax system and management of revenues arising from large industrial mining projects.

Integrating the artisanal mining into mainstream development. Because of lack of institutional capacity of the administration, most of the small-scale and artisanal mining is being

conducted outside the formal channels, with insufficient linkages to the rest of the economy, damage to environment, social conflicts, and loss of fiscal revenues. The government needs to implement policies to better integrate these individuals and small firms with the rest of the economy.

Given the huge variation of Mozambique's geological and environmental conditions, there are no standard solutions to the problem. Over the medium term, policies need to introduce a higher degree of decentralization and a higher degree of participation by affected communities. In concrete terms, this calls for:

- capacity building of the Provincial mining administration, with the establishment of a better alignment between core central public sector functions and the implementation of their mandates at the Provincial level;
- definition of effective means for community empowerment and participation, including the establishment of public-private partnerships with responsible mining companies willing to invest part of their profits in human resources, and social and physical infrastructures;
- technical assistance for the formation of miners' organizations and associations. This includes identifying intermediaries to provide this assistance, which is particularly problematic where miner communities are scattered and remote. It also requires establishing a legal framework for miner associations to register and become formalized. A particular issue to include is capacity of artisanal mining associations, local communities and local governments for conflict resolution;
- provision of direct education and training on health (including HIV/AIDS awareness), safety and environmental impacts to miners, local community members and local governments. This has proven effective in helping miners minimize the hazards of small-scale mining, including damage to the mining area and surrounding communities;
- participatory, community-driven planning to identify livelihood alternatives to small-scale mining. Livelihood diversification is important to ensure communities in mining areas have a life beyond the mine. Sustainable Livelihoods Approach is being used in many support programs to help communities identify alternatives. Women have been found to have a key role to play in livelihood diversification strategies since they tend to be more active in non-mining activities.

The on-going decentralization process provides a unique opportunity to effectively put rural communities in the driver's seat and tailor public policy and investments to local reality, thereby increasing their relevance.

At the municipal level, the biggest challenge would be to increase the tax revenues of the municipalities through the decentralization of tax collection mechanisms. The on-going reform of the mining fiscal regime (in coordination with the Ministry of Plan and Finance) could increase fiscal revenues in resource rich municipalities, and channel such revenues directly to them. Empowering local communities to local management of mineral resources through their

integration in CDD-type development strategies and the preparation of local economic development plans could be an effective tool in the process of managing economic and social development, and reducing and refocusing the State's role, while creating the conditions for increased private sector participation. Another major challenge is improving good governance and transparency of revenue expenses by the communities themselves.

Improving governance in revenue management from the exploitation of mineral resources. Although Government tends to recognize that a special tax treatment is needed to accommodate the specificities of mining, this should be done in such a manner that the treatment is automatic for all mining firms, rather than provided on project specific basis, and in the form of a special incentive. As a general objective, the government would want to set up a uniform, workable, and competitive tax system, compatible with the overall tax legislation, eliminating special exemptions to the general fiscal system. Transparency and security for investors should be improved by the introduction of Standard Contract Agreements, introducing special clauses for specific purposes, like provisions for infrastructure financing or stability clauses, but reducing to the maximum extent possible the clauses subject to negotiation, to avoid lengthy case-by-case negotiations and rent seeking. The Standard Contract Agreements should have no derogations to the common law.

The following principles should be observed in improving the mining taxation package for Mozambique:

- **taxes should be consistent with those of other sectors of the economy.** All sectors of the economy should be subject to the same – or very similar – taxation, for investments to be made efficiently. Such tax neutrality across sectors means that investment and production decisions should not affected by differential taxes or incentives, but by sector differences in potential profits and risks. Taxes and incentives should apply equally to all players: local and foreign private investors as well as any state-owned enterprises. The total fiscal package should be competitive in the global industry, in particular with regional countries;

- **the fiscal regime should be profit-based rather than production-based, avoiding excessive royalties, which have to be paid independently of profitability.** The division of the royalties levied on mineral production must be fair to both the state and the investor. A division tilted in favor of the state implies a disincentive to invest; if titled in favor of the investor, it can cause disrupt in government and lead to continued renegotiations;

- **taxes should be stable over the long term**: the decision to develop a mine entails huge commitments for the life of a project with long return on investment periods; it is therefore important that the country's mineral taxation regime be stable. Prior to committing themselves to major long-term investments, mining companies need assurances from governments that their projects will not be affected by adverse changes

on the mining legislation and related sectors, such as environmental legislation, federal taxation, and trade and foreign exchange policies. Therefore, a Stabilization Agreement that provides explicit, standardized, and non-negotiable guarantees of stable treatment with respect to fiscal burdens, foreign exchange controls, and environmental requirements should be core parts of Mozambique's mining Investment Agreement;

- **the tax regime should be adapted to reflect some of the sector's major characteristics**: (i) mining is a high risk, capital intensive industry and therefore the fiscal regime should allow the mining company to recover its capital investment before paying substantial amounts of taxes; (ii) income taxes should recognize that mining is a cyclical industry marked by fluctuating market prices, and provide loss carry-forward rules and the carry-back of mine closure costs; (iii) the fiscal regime should take into account the fact that minerals are non renewable resources and therefore allow for all exploration and development costs to be expensed or amortized when incurred; and (iv) the remote location of most mining activities and the overall lack of infrastructure in the country entails the consideration of a specific regime for the depreciation of infrastructure works and social assets.

- **MIREME should be allowed to collect users' fees to provide for the financial sustainability of the public mining institutions**. The principle was already established with the diploma earmarking 40% of the proceedings coming from mining fees and penalties to the funding of some mining institutions. Although the amount is very modest, it could be expanded to the sector specific taxes. Twenty five percent of the mining royalty is already earmarked for sector promotion thorough the Mining Development Fund (Fundo de Fomento Mineiro). Provisions should also ensure that the revenues are shared with affected communities.