

An Economic Analysis of Natural Resources Sustainability in Mozambique Fisheries

by Arne Eide



1 Content

| | | |
|----------------|--|----|
| 1 | Content | 2 |
| 2 | Basic economics and rough estimates of benefits | 3 |
| 2.1 | Subsistence and labour intensive artisanal fisheries | 5 |
| 2.2 | The Nature of Market Failure in an Open Access Fishery | 6 |
| 2.3 | An overview over the Sofala Bank Shrimp Fishery | 8 |
| 2.4 | Tuna fishery in the Mozambican Channel | 14 |
| 2.5 | The kapenta fishery of Cahora Bassa..... | 15 |
| 2.6 | The gamba fishery..... | 16 |
| 2.7 | Cost Recovery | 17 |
| 2.8 | Summarising basic economics | 18 |
| 2.9 | Hypothesis appraisal | 19 |
| 3 | Regulatory Needs | 21 |
| 3.1 | Quota Management..... | 21 |
| 3.2 | Management of the shallow water shrimp fishery | 22 |
| 3.3 | The kapenta fishery of Cahora Bassa..... | 25 |
| 3.4 | Crucial regulatory issues..... | 25 |
| 3.5 | Hypothesis appraisal | 27 |
| 4 | Governance issues | 28 |
| 4.1 | Fisheries statistics | 29 |
| 4.2 | Monitoring, Control and Surveillance (MCS) | 30 |
| 4.3 | Fishing Rights | 31 |
| 4.4 | Hypothesis appraisal | 33 |
| 5 | Recommendations | 36 |
| 6 | References | 38 |
| Annex 1 | | 40 |
| | An Economic Analysis of Natural Resources Sustainability in Mozambique | 40 |
| | Terms of Reference..... | 40 |
| | Motivation..... | 40 |
| | Objectives of the study..... | 41 |
| | Specific issues and questions to be addressed | 41 |
| | I. Basic economics of the sectors and rough estimates of forgone incomes due to current policies | 41 |
| | II. Regulatory and Incentive Gaps and Failures..... | 42 |
| | III. Governance Issues | 44 |
| | Timeframe and Work Program | 45 |

2 Basic economics and rough estimates of benefits

Mozambican fisheries are characterized by vast varieties of environmental conditions, catch technologies, ownerships and market structures. Fisheries take place in freshwater lakes, dams and rivers, brackish water, mangrove forests and other coastal areas, or in open ocean waters on the continental shelf and pelagically. The diversity of habitats include coral reefs and rocky bottom in the narrow shelf zones, the soft bottom of the Sofala Bank and the deeper areas on the continental slope.

The resources include bivalves and Mangrove crabs collected in the littoral zone or caught in traps, small demersals and pelagics caught near shore in beach seines and gill nets, shallow water shrimp mainly caught on the Sofala Bank by industrial and semi-industrial trawlers and artisanal fishermen, smaller shrimp species caught by artisanal fishermen, squid and octopus, larger demersals caught by long line, hand line and trap fisheries, deep water stocks such as deep water shrimp, lobster and crab caught by industrial trawlers and tuna which is caught offshore by industrial long line boats.

Table 1. *Mozambican fisheries sub sectors, environment and capital use.*

| <i>Fisheries sub sectors</i> | <i>Environment (locations)</i> | <i>Capital use</i> |
|------------------------------|---|--------------------|
| Subsistence | Fresh water rivers, lakes and in shallow water along the cost | Very low |
| Artisanal | Fresh water rivers, lakes and in shallow water along the cost | Low |
| Recreational | Fresh water rivers, lakes, coastal waters and open sea | Medium |
| Semi-industrial | Fresh water dams, coastal waters and open sea | High |
| Industrial | Coastal waters and open sea | Very high |
| Processing industry | Main fishing ports | High |

Catch technologies ranges from collecting mussels and other labour intensive techniques hardly including any capital, to highly advanced trawler fisheries (shrimp) and purse seine tuna fisheries. Typically these capital intensive fisheries are partly or fully owned by foreign companies, and the products exported to international markets in Europe and in Asia.

The Mozambican fishing sector is separated into six sub sectors (Table 1) of which the majority of fishermen are found in the subsistence and artisanal fisheries. Although the actual number of fishermen within these sectors is uncertain, frame studies indicate that it is more than

80,000 fishermen and recollectors (Table 2). Artisanal and subsistence fisheries is of crucial importance for the food supply in large regions of the country, as fish products consist for more than 20% of the animal protein supply and fishing in many cases is the only accessible source of food production. In recent years around 35 - 40% of the total Mozambican exports value has been from export of shrimp.

Table 2. *Employment in Mozambican subsistence and artisanal fisheries. Estimated numbers of fishermen (stationary, non-stationary, without boats) and recollectors (men and women) from frame studies during 1990-1995.*

| Province | Permanent fishermen | Non-permanent fishermen | Fishermen without boat | Fishermen (total) | Recollectors (men) | Recollectors (women) | Recollectors (total) | Sum |
|-------------------|---------------------|-------------------------|------------------------|-------------------|--------------------|----------------------|----------------------|---------------|
| Niassa (95) | 3,083 | 1,438 | 2,046 | 4,521 | 100 | - | 100 | 4,621 |
| Cabo Delgado (95) | 6,624 | 2,781 | 8,073 | 9,405 | 3,854 | 4,532 | 8,386 | 17,791 |
| Nampula (94) | 19,229 | 1,961 | 2,289 | 21,190 | 2,049 | 4,331 | 6,380 | 27,570 |
| Zambezia (92) | 5,460 | 380 | 552 | 5,840 | 4 | 36 | 40 | 5,880 |
| Tete (93) | 1,287 | 109 | 46 | 1,396 | - | - | - | 1,396 |
| Sofala (90) | 7,873 | n.a. | n.a. | 7,873 | 209 | 100 | 309 | 8,182 |
| Inhambane (91) | 5,043 | 993 | 5,222 | 6,036 | 1,844 | 3,002 | 4,846 | 10,882 |
| Gaza (94) | 2,492 | 47 | 325 | 2,539 | 9 | 20 | 29 | 2,568 |
| Maputo (95) | 483 | 1,838 | 399 | 2,321 | 450 | 2,183 | 2,633 | 4,954 |
| Total | 51,574 | 9,547 | 18,952 | 61,121 | 8,519 | 14,204 | 22,723 | 83,844 |

n.a. = not available

Source: Atlas da Pesca Artesanal. IDPPE. Surveys conducted 1990-1995.

Based on current knowledge of the Mozambican fish recourse situation, infrastructure and economic conditions, there are no other opportunities of developing any other Mozambican fisheries matching the Sofala Bank industrial shrimp fishery in profitability and scale in the near future.

- At current trade prices, the fishing operations of deep water crustaceans, particularly deep water shrimp (*gamba*), are very costly and hardly profitable.
- Although very profitable until the end of the 90's, the deep water spiny lobster industrial fishery collapsed due to an increase in effort allowed by the fisheries administration when the sector was integrated in the Ministry of Agriculture and Fisheries (MAF). It is not expected that the stock will be fully recovered during the next five years.

- The *tuna* fishery in the Mozambique Channel is a seasonal operation and has to be considered in the frame of the Indian Ocean fishery.
- The long-line fishery of *oceanic big pelagic* resources doesn't seem to be able to expand and is increasingly affected by international restrictions on the exploitation of some species.

Although very far from the results provided by the shallow water shrimp industrial fishery of Sofala Bank, a second group of fisheries are nevertheless economically attractive:

- Although very dependent on the regional marketing conditions, the semi-industrial kapenta fishery of the Cahora Bassa reservoir; and
- The semi-industrial line fishery of *rock bottom fishes* in the Centre/Southern Mozambique in spite of having been negatively affected by the intense levels of exploitation allowed by the fisheries administration in the second half of the 90's. This fishery was traditionally located in the coastal waters South of Inhambane city but, after the partial collapse of the resources, most of the vessels that remained in the fishery transferred their operations to the less exploited coastal areas North of Inhambane Province and the unexploited areas South of Sofala Province, in the Centre of the country.

All the other fishing activities are either subsistence or artisanal fisheries. Although some of the latter are integrated in the national market economy (depending on the infrastructural conditions and the price of the product), they remain largely confined to local markets and covering self-consumption/subsistence needs of the fishermen households.

2.1 Subsistence and labour intensive artisanal fisheries

It is well known that many coastal fisheries play crucial roles by being economic buffers in periods of few or no other sources of food and income. Available fish resources, open access and low capital need, is necessary conditions of using fishing as an efficient economic buffer, providing fast responses on economic changes in the region. The entry/exit dynamics of such fisheries also reflect opportunity costs of labour in the region. In the case of growing possibilities

of making a living outside fisheries, the pressure on the fishery sector is reduced. Normally this leads to increased catch per unit of effort in the fisheries, mainly depending on the biological property of the resource. As in other open access fisheries the resource rent is invested in what could be interpreted as over capacity in strict economic terms. In this case the over capacity almost completely consists of labour or employment, which is easier to replace in case of alternative employment possibilities.

In the perspective of implementing poverty reduction policies, the dynamics of the open access fisheries resources therefore is of great importance. Actions like investments, extension services, credits etc. targeting the fishing sector specifically, therefore may create barb effects slowing down the transfer of employment in fisheries to other sectors. Further it may also damage the resource potential by making an already intensive fishing effort more efficient. In many cases fishing methods and gears are inadequate and the role of extensionists could ideally be to provide the fishermen with moth adequate methods to better take advantage of the resource potential by reducing the use of destructive and illegal fishing methods. The immediate effect of for example alter size composition in catch by abandon the use of mosquito nets, probably is a dramatic reduce in catch. High biologic turn over rates as is the case in many tropic fisheries may however change this situation rapidly. For the single fisherman on the other hand, increased mesh size only means a less efficient fishing gear, which could be expressed by increased unit cost of catch.

This macro perspective is essential in order to understand the importance of the fish resources in the current situation of severe poverty and lack of essential commodities like food and water, but also to avoid this to develop into a situation of resource depletion and wasted opportunities.

2.2 The Nature of Market Failure in an Open Access Fishery

Open access to biological resources like fish normally implies a *market failure*. The nature of the market failure is related to one or both of the following conditions:

1. **Scarcity.** The scarcity of the resource does not reflect in a positive resource price because of open (free) access (the problem of common property).

2. **Interdependency of production factors.** In the long run the availability of the resource usually is influenced (and even determined) by former catches and fishing pattern.

The first implies a super-normal profit (resource rent) in the fishery due to the value of the scarce resource which is free. A fishery as an economic buffer implies that the resource rent fully or partly will be used to finance a rate of employment exceeding the level normally referred to as a full utilisation of the resource. This overcapacity (related to normal utilisation level) may be maintained in a sustainable way, using the resource rent to subsidise employment (overcapacity). Optimal use of the resource rent in the long run does however not necessarily include subsidising employment as in the case when utilising the fish resources as an economic buffer.

The other condition causing a market failure is the biological interrelation between catch and later stock availability (interdependency). This factor is what normally motivates governmental intervention by fisheries regulation. In most fisheries this interrelation is very pronounced, but fisheries exist where such a relationship is hard to establish. Some tropical fisheries may also have such a fast biological turn over rate that a long term interrelation may be less pronounced even when catch impact on stock biomass is obvious. When such interrelations are not found the need of regulations has to be requested. The first factor (scarcity) may however still provide a valid reason for governmental interventions. The Mozambican kapenta fishery seems to be an example of this kind of fisheries.

It is therefore essential to identify what type of market failures that may exist and imposing proper management means consistent with the governmental objectives, which may be to collect some of or all the resource rent. Since such management regimes tend to be costly, often involving numbers of different regulations on different levels, reflecting the many varying dimensions described earlier, it also seems essential that it is balanced in relation to the resource rent potential.

The Mozambican policy in this matter has been very clear, stating a cost recovery goal in the Master Plan of 1994 (Anon., 1994). Unlikely most other countries in the region it has also been verified that Mozambique already has reached this goal and in fact already can enjoy a positive net resource rent from the fishing sector (Degnbol et.al., 2002; Eide et.al., 2003), even

when not taking into consideration the subsidy of employment. This is however uniquely due to a single fishery, namely the shallow water shrimp fishery which will be described in more details later.

The variety of dimensions and the variations within each define however a large number of different fisheries, as indicated in Table 1. Fish resources are exploited in a number of different ways, not all of them necessarily calling upon governmental interventions. Most often modern fisheries management is motivated of biological reasons, but increasingly economical arguments, like the market failure pointed at above, play important roles. The Mozambican case is to a large extent reflecting this. The management regimes implemented seem to reflect a biological perspective rather than economical reasoning, leaving the impression that factor 2 above is given more attention than factor 1. Although this also may be the situation in most other fishing nations, it may be questioned if this is the most relevant approach when implementing fisheries management in the Mozambican context, as the examination of some of the main fisheries (below) may show.

2.3 An overview over 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 8 thousand tonnes were exported at a value of 70 millions US\$ (Degnbol et.al., 2002). 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 participating in the industrial shrimp fishery.

Attempts has been made to quantify both the potential resource rent and the actual resource rent currently collected in the shrimp fishery (Eide et.al, 2003). Although available information as pointed out above, confirms that indeed a positive resource rent is produced, available information is not sufficient to produce a reliable estimate of the potential Mozambican benefits form the fishery. Lack of transparency and governmental control of the key operators seem to be a problem in this respect. This applies to the allocation of quota rights and to specific

information on taxation and accounts of the involved companies. Basic catch statistics is also hard to access in comprehensive data bases and the uncertainty regarding statistical information is read from the discrepancies between catch values presented in tables 3 and 4.

Nevertheless available information on the shallow water shrimp fishery is much richer than what is the case of other Mozambican fisheries, e.g. the important tuna fishery in the open sea areas in the Mozambican channel between Mozambique and Madagascar (see point 1.4).

Table 3. *Catches, standardised effort and catch per effort (CPUE) and stock estimates in the Sofala Bank shallow water shrimp fishery 1980-1999. The table is including industrial and semi-industrial sub-sector. Incidental catches of artisanal sub-sector are probably low and ignorable. See body text below for details.*

| Year | Catch (tonnes) | Effort (std.Vega hours) | CPUE (kg/hour) | Average stock biomass (tonnes) |
|------|----------------|-------------------------|----------------|--------------------------------|
| 1977 | 9,500 | 102,000 | 93.1 | 7,989 |
| 1978 | 9,600 | 112,000 | 85.7 | 7,388 |
| 1979 | 8,778 | 137,000 | 64.1 | 5,498 |
| 1980 | 8,007 | 138,052 | 58.0 | 4,983 |
| 1981 | 9,377 | 146,516 | 64.0 | 5,498 |
| 1982 | 7,908 | 155,059 | 51.0 | 4,381 |
| 1983 | 8,101 | 207,718 | 39.0 | 3,350 |
| 1984 | 8,205 | 195,357 | 42.0 | 3,608 |
| 1985 | 8,128 | 172,396 | 47.1 | 4,038 |
| 1986 | 7,720 | 175,455 | 44.0 | 3,772 |
| 1987 | 7,206 | 167,581 | 43.0 | 3,674 |
| 1988 | 7,290 | 169,535 | 43.0 | 3,550 |
| 1989 | 5,807 | 165,914 | 35.0 | 2,954 |
| 1990 | 5,668 | 195,448 | 29.0 | 2,496 |
| 1991 | 6,967 | 217,719 | 32.0 | 2,746 |
| 1992 | 6,332 | 204,258 | 31.0 | 2,660 |
| 1993 | 6,696 | 216,000 | 31.0 | 2,660 |
| 1994 | 6,321 | 222,177 | 28.5 | 2,446 |
| 1995 | 7,344 | 254,047 | 28.9 | 2,480 |
| 1996 | 7,221 | 270,053 | 26.7 | 2,114 |
| 1997 | 8,419 | 278,190 | 30.3 | 2,509 |
| 1998 | 7,861 | 313,000 | 25.9 | 2,241 |
| 1999 | 8,114 | 315,000 | 25.8 | 2,310 |

Source: Eide et.al. (2003).

Foreign fleets have been fishing shrimp on the Sofala Bank outside territorial waters at least from 1964 and probably several years earlier. Industrial development of the Mozambican fishery did not start until 1978, when EEZ of 200 nautical miles was introduced. Joint venture fishing companies with foreign interests were established since Mozambique at the time did not have the necessary know how and skilled personnel to perform the fishing operations themselves (de Almeida and Santos, 1991 and 1997).

As seen from table 3 effort has increased by a factor of three during the period since the start of the industrial fishery in the late 70'ies. Catches have however been fairly constant just below ten thousand tonnes per year during the period. Two joint venture companies, Pescamar and Efripel, have been dominating the fishery most of this period and in 2004 three companies (Crustamoz in addition to the two dominating companies) were holding more than half the total shrimp quota.

Table 4. Quotas and catches of shallow water shrimp trawlers with freezers, separated on industrial and semi-industrial sub-sector for the period 1995 – 2003.

| Year | Quota ²⁾ | | Catch | | | | |
|------|-----------------------|----------------------------|-------------------------------------|--|---------------------|---------------------|---------------------|
| | Industrial sub-sector | Semi-industrial sub-sector | Industrial sub-sector ¹⁾ | Semi-industrial sub-sector 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

The Mozambican side is represented in the joint venture companies by the holding company Emopesca. The value of Emopesca has been estimated to be in the range of 100 mill US\$ based on data from the early 90'ies (Eide et.al., 2003). Recently Emopesca has reduced its holding of shares in the largest operator, Pescamar, from 49% to less than 30%. It has however been difficult to find information on how this reduction came about and to what price the shares were transferred to the other shareholder, Pescanova. A similar transaction may take place in the other major joint venture company, Efripel, assuming this to reflect a new Mozambican policy in the joint venture cooperation.

The estimated value of Emopesca does not include the possible placement of resource rent in labour costs. It is however clear that scarcity of competent and skilled personnel is a major constraint on the fishing efficiency. Labour contracts indicate that major shares of the

profit (which includes the super profit or resource rent) are paid out as bonuses or large salaries. It may however be disputed if this resource rent derives from the shrimp resource or from the personnel resource in this case. It may therefore indicate that the value of Emopesca potentially is much larger than 100 mill US\$ in present value terms. A potential annual flow of resource rent based on this reasoning may be in the range of 10-30 mill US\$ to the Mozambican government from the shallow water shrimp resource only.

Table 5. 2002 key figures (in US\$) of the largest Mozambican fishing companies.
Sources: KPMG (2003)

| Rank | Company | Revenues | Net Profits | Net Assets | Shareholders' Fund | Operating Costs | No. of Employees |
|------|--|------------|-------------|------------|--------------------|-----------------|------------------|
| 28 | Pescamar (Sociedade de Pesca de Mariscos) Lda. | 18,031,672 | 981,865 | 17,130,790 | 8,196,803 | 13,360,911 | 603 |
| 54 | SIP (Sociedade Industrial de Pesca), Lda | 5,279,810 | 298,399 | 592,514 | 503,264 | 4,875,934 | 109 |
| 92 | Gambeira, Lda | 2,623,426 | 228,081 | 514,373 | 240,795 | 2,374,077 | 30 |
| - | Indicopesca, Lda | 1,789,962 | 27,480 | 629,412 | 92,751 | 1,708,298 | 47 |
| - | Mavimbi, Lda | 1,615,073 | 6,730 | 1,454,765 | - 25,323 | 1,608,041 | 20 |
| - | EMOPECA (Empresa Mocambicana de Pescas) EE. | 1,038,119 | 36,453 | 3,313,751 | 2,399,659 | 926,128 | 27 |
| - | Equipisca, SARL | 557,886 | 4,012 | 672,465 | 278,209 | 300,254 | 41 |
| - | Pesca do Alto (Pescalto), Lda | 465,868 | 22,045 | 113,027 | 61,733 | 430,709 | 15 |
| - | Companhia de Pescas da Zambézia, Lda | 156,598 | -123,553 | 775,699 | 52,113 | 280,151 | 130 |
| na | EFRIPEL (Entrepósito Frigorífico de Pesca de Moambique) Lda.*) | 14,528,465 | 4,175,544 | na | na | na | na |

*) Efripel is represented by 1998 figures published in Africa Research Bulletin (2000).

Efripel and Pescamar are subjects to a specific taxation regime, which only applies for these two companies, paying a special tax on exploration of natural resources (Taxa de Exploracao dos Recursos Naturais, TERN). The two companies which are subjects to the TERN taxation do not pay license fees. According to Degnbol et al. (2002) the two companies in 1999 paid more than 3.5 million US\$ in TERN taxation. Later information (see Table 6) indicates however that this figure may be too high, even when correcting for the change in exchange rate during the period. Currently the TERN taxation is 2.7 million US\$.

TERN taxation is calculated on basis of operation costs and paid directly to treasure. This differs from standard license fees, which goes through the fisheries administration, partly

financing this. Degnbol et.al. (2002) found the income from license fees to be close to 2 million US\$ in 1999.

Table 6. *Taxa de Exploracao dos Recursos Naturais (TERN), 2000-2003, in million US\$. Converted from Mozambican Meticaais to US dollars at the rate 1 US\$=22,910 Meticaais. Source: MdP (2004)*

| | 2000 | 2001 | 2002 | 2003 |
|--------------|--------------|--------------|--------------|-------|
| Efripel | 0.742 | 0.786 | 0.917 | na |
| Pescamar | 1.091 | 1.615 | 1.746 | 1.659 |
| Total | 1.833 | 2.401 | 2.663 | - |

Until 1993 all fish products were subjects to export taxation, 5% of the export value. The sudden elimination of this general export taxation, took away the only governmental taxation on this fishery at the time. TERN taxation was introduced, but has only partly recovered the income loss after export taxation was removed (Degnbol et al., 2002). This incident illustrates a problem equally relevant today, of lack of coordination between different objectives and the different governing bodies. Lack of transparency and possible hidden agendas makes it even harder to achieve a fully coordinated and consistent management situation.

The TERN taxation was first set up as a tax on profit. At the time the company accounts showed low profit and the government suspected the companies to take advantage of vertical integration and complex accounting systems in order to minimize profits. Because of this TERN was later related to running cost in stead of profits. Since the total catch of the two companies is exported, TERN as it is today represents taxation on cost while export taxation would represent taxation on income. Income relates of course to total catch and a world market price. Although internal prices can be claimed due to vertical integration, Mozambican authorities should insist on using the world market prices. In this case export taxation actually is a more true the natural resource use taxation than the cost oriented TERN of today. A combined system of license fees (being the normal limited entry management system for other participators) and export taxation, which also should include other exporters, should be considered.

Even though it is difficult to estimate the resource rent collection, it is possible to get a rough idea of the net revenue generated by the efficient shrimp trawling operations in the Sofala Bank industrial fishery. Based on the available information on arrangements currently being

established between local *quota-owners* and foreign *ship-owners* concerning the chartering of shrimp trawlers, a study has estimated net income generated by the fishery to be at least 40% of the total revenue (de Almeida, 2004a). When assuming 80% of the exported catch to be produced efficiently, this figure would reach an annual value of around 24 million US\$ before tax (a corporation tax of 35% of the accounted profit). This implies that each ton is generating a net revenue of around 3,800 US\$ per ton (1,900 US\$ to the local partner) 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.

During the 80's, when foreign vessels were fishing under intergovernmental agreements without any joint venture arrangements set up, the licence fee value was established around 20% of the international price (1,000 to 1,250 US\$ per ton). According to the study the maximum value for the fishing licence could presently be set in around 1,900 USD per ton.

It was strongly believed that the joint venture alternative system was preferable to the former as it promoted the creation of a local and increasingly integrated fishing and processing industries that otherwise wouldn't be possible. However, the present distribution of the net revenue is not made on a transparent and equitable manner. Foreign shareholders in the joint ventures can to a great extent control import and technical assistance costs and export prices. This allows them to decide where to locate the profits generated by the fishing operations.

The allocation of this net revenue is to a large extent in the hands of the foreign shareholder who is vertically controlling all the process from fishing to marketing. No public information is available on the amounts collected from the joint ventures by Emopesca and the value handed from these joint ventures to the Ministry of Planning and Finance. However, there are some signs that the Emopesca costs are very high. It is common practice by Emopesca to pay high salaries to staff members and to appoint board directors that are selected either from the company or the fisheries administration, being the respective remunerations supported by the joint ventures. On the other hand, there are indications that the recent privatisation in favour of the foreign partner in the three most important joint ventures of 16 - 21% of the share capital owned by Emopesca was not backed by suitable evaluations. The value derived from these partial privatisations therefore is likely to be higher.

Furthermore, the existence of a government holding company is not contributing to liberate a higher amount of this net revenue. Surprisingly, three years after being created, the *Instituto para a Gestão de Participações do Estado* (IGEPE, the institution under the Ministry of Planning and Finance in charge of managing the shares owned by the government in private companies.), does not seem to have established any regular links with Emopesca.

Finally, as it can be perceived through available information, the part of the net revenue kept in Mozambique by some of the quota-owners is likely 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. Nevertheless, this raises the question whether the pressure on the local entrepreneurs for creating their own fleet is actually a preferable strategy.

2.4 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) of which Mozambique is a member. This arrangement includes a control system of vessels implemented by Mauritius and the Seychelles. Tuna are harvested on basis of agreements with tuna associations. Such agreements exist with associations in Japan, the European Union (EU) and others. The EU agreement spans over three years (starting January 1, 2004) and replaces earlier bilateral agreements with EU members (France and Spain).

Quotas, effort and the annual compensation to be paid for the EU fishing rights are specified in the agreement (*Official Journal of the European Union*, 2003). The European Union is allowed to have 35 freezer tuna seiners and 14 surface long liners in Mozambican waters, in addition to other fishing rights. The annual compensation of a tuna quota of 8000 tonnes is set to 600,000 EU, and another 75 EUR per additional ton.

Table 7. Recorded catches from 1996 – 2003 for the commercially most important species shows some fluctuations in catches during this period with a peak in 2000, as shown in the table below. (Numbers in tons):

| Year | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|----------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Shallow water shrimp | 8,123 | 9,605 | 8,559 | 8,475 | 9,420 | 9,479 | 9,222 | 7,990 |
| Deep water shrimp | 1,771 | 1,510 | 1,882 | 1,611 | 1,766 | 1,738 | 1,441 | 1,413 |
| Lobster | 331 | 207 | 237 | 203 | 228 | 199 | 276 | 243 |
| Crayfish | 132 | 156 | 147 | 92 | 105 | 69 | 80 | 124 |
| Crab | 960 | 564 | 861 | 795 | 832 | 629 | 890 | 624 |
| Kapenta | 5,458 | 9,887 | 7,312 | 9,044 | 12,192 | 7,076 | 12,037 | 10,831 |
| Fish and others | 3,092 | 2,575 | 1,171 | 1,193 | 7,841 | 7,686 | 6,550 | 11,471 |
| Octopus/squid | 72 | 122 | 176 | 135 | 647 | 420 | 558 | 390 |
| Bycatch | 2,114 | 1,747 | 1,681 | 1,197 | 1,275 | 1,080 | 1,498 | 1,506 |
| Tuna | 3,210 | 2,461 | 8,352 | 3,082 | 5,081 | 3,096 | 3,096 | 3,000 |
| Total | 25,263 | 28,834 | 30,378 | 25,827 | 39,387 | 31,512 | 33,172 | 31,010 |

Source: Ministry of Fisheries, Catch statistics 1996- 2002 (www.mozpesca.org) and Relatório do balanço geral de actividades do ano 2002 and Plano económico e social do sector para o ano2004, Direcção Nacional de Economia Pesqueira.

The EU-quota size (8000 tonnes or more) indicates that actual catches in the tuna fishery have been substantially larger than the recorded catches (Table 7). Mozambique has not been able to control the performance of the license holders, lacking patrol vessels and other instruments to exploit in monitoring, control and surveillance (MCS) of the fisheries. Other species is increasingly becoming of commercial interest. Illegal vessels have been known to operate in Inhambane waters fishing sharks since 2002 and hundreds of dead turtle and sharks have been found along the coasts of Vilankulo, Inhassoro and Bazaruto. In April 2004 a Chinese purse seiner was caught by a South African patrol vessel after illegally fishing sharks (keeping only the shark fins), covered as tuna fishery in Mozambican waters.

2.5 The kapenta fishery of Cahora Bassa

The largest share of the semi-industrial sub-sector consists of shrimp trawlers (66%), while long liners and Cahora Bassa kapenta platforms equally share the rest. The Cahora Bassa dam in the Tete province began to fill in December 1974 after construction was commenced in 1969. The lake has reached a maximum length and width of approximately 250 km and 38 km respectively, flooding an area of 2,700 km² with an average depth of 26 m.

The kapenta fishery, which has been developed recently, has almost fourfold the catch volume since mid nineties, which currently is around ten thousand tonnes a year. This makes the kapenta fishery the largest registered single catch volume in Mozambique.

The history of the kapenta fishery is short as the lake (or dam) itself. Kapenta (Tanganyika sardine) has filled the dam after being floating downstream from Lake Kariba where it was introduced (from Lake Tanganyika) in 1967. Kapenta shows an incredible growth in Cahora Bassa as in Lake Kariba, partly because of no natural enemies and partly because of dense and available food. Only a few years after the introduction in Lake Kariba a commercial fishery was established. The same happened in Cahora Bassa after large quantities of kapenta was discovered (Meisfjord, 2001).

About half the catch is exported to the regional market and the export value in 2001 was in the range of 5 million US\$ (Degnbol et.al., 2002). The importance of kapenta in the local markets as cheap food rich in proteins is also significant. Few biological considerations, simple catch technology and high quality products cheaply produced by sun drying, makes the kapenta fishery a valuable resource also in a poverty reduction perspective.

2.6 The gamba fishery

The deep water shrimp price is less than two thirds if compared with the shallow water shrimp and the operational costs are higher. With exception to some South African experienced operators, the presence of other foreign ship-owners in the fishery was never regular. The South African companies have a more comprehensive knowledge of the fishery - as Mozambique and South Africa share a common ecological system covering the Inhambane, Maputo and Kwazulu-Natal provinces - and are able to rationalise costs and catch targets due to the proximity of the base port of Durban and the access to the local market.

The fishery is often used as a buffer by either 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). The deep water shrimp fishing licences were sold since the 70's at a lower value than the shallow water shrimp (20% of the international average price: around 750-850 US\$ per ton).

The chartering arrangements between *quota-owners* and *ship-owners* concerning the share of revenue are presently made on 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 presences in the fishery in spite of a the annual compensation of around 4 million € paid in advance . For all these reasons, it can be concluded that the deep water fishing operations, although they may be profitable, are most likely not able to produce high levels of rent.

2.7 Cost Recovery

It was a part of the Master Plan to achieve cost recovery for the fisheries administration by 1996. Financial autonomy should be achieved by locking the costs of the various aspects of the fisheries administration including research and management to a certain percentage of the primary value of landings. There has been no follow-up on this issue, but estimates by Degnbol et.al. (2002) indicate that full cost recovery has been achieved if TERN (see point 1.3 for description) is included in the calculation. The new EU agreement gives an additional 4 mill EUR (compensation value) per year in a period of three years, which fully is to the disposal of MdP and its institutions after an agreed distribution (Table 8).

Table 8. *The following measures shall be financed from the financial compensation from EU due to the agreement (Article 3 in the protocol).*

| Financing | EUR |
|---|------------------|
| Monitoring marine fisheries | 1,500,000 |
| Institutional development | 1,000,000 |
| Research | 1,000,000 |
| Training | 430,000 |
| Quality control | 100,000 |
| Participation in Joint Committee and other international meetings | 60,000 |
| Total | 4,090,000 |

A fund allocation system that covers the costs of the fisheries administration is already in place, currently providing a surplus collected by the Ministry of Planning and Finance. Although this arrangement can still be improved, the fact that it was set up represents for itself an important achievement.

The way funds are paid back to the fisheries administration is however complex and not transparent. This makes it difficult to get a full overview of the financial flow. The fisheries institutions are partly financed from the treasury, which also receives 40% of the licenses. 10% of the licenses share is attributed directly to fisheries institutions. Fundo de Fomento das Pesqueiro (FFP), which receives and redistributes 50% of the license income, finances the rest of the cost of running the fisheries institutions. Only estimates are available in the case of TERN, as the Ministry of Fisheries claims not to have any information on this.

2.8 Summarising basic economics

Mozambique is in an unique situation of having available fish resources which currently super normal profit (resource rent) is collected. It seems however clear that only a minor fraction of this resource rent goes back to the Mozambican government. The governmental holding company Emopesca has considerable benefits, but the distribution of these benefits has not been possible to trace. Net assets and shareholder funds counts however for 6 millions US\$ (Table 5). It is further a problem that this company, which was constructed to be the most important governmental instrument to control the shrimp fishery output, reduces shares of ownerships and plays a diminishing role as such an instrument. The main problem is however that this is happening in a non-transparent way, where neither the sale nor the price is published. Since the estimated value of Emopesca is in the range from 100 million US\$ or more, this seems to be a crucial issue to resolve and clarify very soon. From the limited information available today, it looks like there exists private or other unidentified interests or hidden agendas which are benefiting from a non-transparent situation. It is an urgent need of bringing this issue up and ensure that the value of the fishing rights managed by Emopesca benefits the Mozambican society as a whole.

Reducing the level of absolute poverty is one of the main objectives of Mozambican fisheries policy, as presented in the *Fisheries policy objectives and the development plan* (PSDP). Also the development of the artisanal sector therefore has to be consistent with these objectives. Capitalising fishing effort and reducing access to fish resources by limiting entry (e.g. by licensing) may severely reduce the buffer capacities of the fish resources (as described above)

dramatically. Even in the case of an open access fishery, increased capital in the sector (e.g. improved gears, boats, etc.), may change the buffer properties and slow down the entry/exit dynamics, also often increasing the risk of resource depletion.

A strategy of poverty reduction should therefore include the development of alternative activities in such a way that the natural pressure on fish resources is reduced and the economic output increased. Increased capital in the fishing sector in the case of sufficient alternatives of employment then represents a positive contribution to the development of the community. The development means should rather have a general approach than being directed towards a specific industry, such as fisheries. This represents a more dynamic perspective on the role fisheries play, which appears to be the most relevant perspective in the Mozambican case, where the economy develops fast, as do the opportunity costs of both labour and other factors.

2.9 Hypothesis appraisal

H2.1 *The government may be abdicating significant revenues with unclear benefits.*

Resource rent is obviously obtained by major operators and are leaking out of Mozambique even though governmental instruments capable of retrieving all or parts of the resource rent in principle exists. The joint venture companies seem to a large extent to be controlled of the foreign companies, which are the actual operators. This has two implications: Resource rent production depends on the participation of the foreign companies and their skilled personal. Secondly are the foreign companies difficult to control, being large international organisations vertically integrated and operating in major markets all over the world. Significant revenues therefore may be lost if not abdicated, because the alternative may be no revenue at all. A key issue is to develop a national Mozambican capacity of exploiting its own fish resources in a profitable way.

H2.2 *The system may be promoting and perpetuating inefficiency in the domestic industries.*

Partly this seems to be true, and again by reference to the shallow water shrimp fishery, as the commitment to developing the semi-industrial industry and the land based production initially promoted the less efficient part of the industry. Later the constraints have been relaxed, because deliverance to land-based producers caused additional costs,

lower quality and less fishing time for the new operators. A large fleet of industrial freezers has therefore emerged in the name of semi-industrials, which long term consequences are yet not fully known.

H2.3 *The main beneficiaries of such policies are not typically the poor.* The poverty issue has to be assessed from two perspectives: 1) *When increasing the governmental income by retrieving obtained resource rent, poverty reducing action can be effectuated.* 2) *The fish resources can be utilised as an economic buffer, reducing poverty and ensuring food supply in periods of crises and extreme poverty (starvation).* In the case of Mozambican fisheries both perspectives seems equally relevant. While point 1 more easily fits into a traditional context of discussion quota values, fiscal reforms, etc., point 2 represents a more dynamic view point, regarding poverty reduction more as a *process* than a *static* plan of actions. It is no doubt that the Mozambican fish resources has played and still plays 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.

H2.4 *Even gross figures of such forgone incomes are not known by the economic sectors of government and perhaps not by society more broadly.* This is certainly true and represents a major problem. The fact that Mozambique has some very profitable fisheries and that resource rent indeed is obtained, is the main reason of the presets of this problem. Rent seeking exists and a non-transparent system makes it possible to operate with hidden agendas. The real magnitude of the problem is however only indicated by the macro values presented above, is has not been possible to produce a more detailed description.

3 Regulatory Needs

In the previous part market failure related to open access fisheries is stated to be a combination of *scarcity* of the natural resource and the *interrelationship between the two input factors* in the production of catch, fishing effort and fish biomass (the natural resource). The latter is the biological dynamics, which include both biological growth and the effect historical catches, have on the present state of the natural resource. While the first type of market failure (the problem of *common property*) gives economic reasons for correcting the failure by introducing a price on the resource (economically motivated regulation), gives the latter (the interdependencies) economic reasons for interventions through the *biological properties* of the resource (biological motivated regulation). Most often both features are present and give reason to both quota management and other management regimes.

Within the Mozambican fisheries there are two major fisheries differing from most other developed fisheries around the world, both of them given specific presentations in the following.

3.1 Quota Management

As in most other fisheries quota management also plays an essential role in the main Mozambican fisheries. This is reflected in the quotas referred to in the first part, both in the shrimp and in the tuna fisheries. All quotas are non-transferable. It should however be noted that in both the shrimp and the tuna fisheries quota management actually is more a control of input (fishing effort) than control of output (catch). Seemingly the quotas could be replaced by ordinary license fees. In the case of the shallow water shrimp fishery, catch quotas actually determine the prices of the license fees.

This situation is however not reflecting that quota management is considered less important than controlling effort directly by limiting entries. Relevant scientific methods of quota setting are not accessible or poorly developed in Mozambican fisheries, but there is a strong belief within the fisheries administration that such competence is useful and should be developed. The fact that positive resource rent yet is produced (as in the shallow water shrimp fishery), could be interpreted as a successful quota management in spite of lacking knowledge on

how to calculate an optimal quota. On the other hand it may as well indicate that quota setting is not essential or not a critical issue in obtaining resource rent from the fishery. In the following presentation of two main fisheries, these considerations are discussed further.

3.2 Management of the shallow water shrimp fishery

In the case of the shallow water shrimp fishery it is hard to establish any clear relationship between stock recruitment and exploitation rate. The shrimp fishery is a mixed species fishery where the recruitment and growth of the main species have a significant seasonal pattern, which makes closed season regulation very efficient (Miguel, 2003). The life span of the main species is about 18 months and the fast biological turn over rate causes tremendous changes in population biomass over the year. Catch per hour the first month after closed season is 5 to 10 times the catch per hour obtained in November and December (Caputi, de Sousa and Dias, 2000). Shrimp recruitment is assumed to be related to the fresh water outflow, in particular from the Zambezi River, but recruitment dynamics is not fully understood (Gammelsrød, 1992). It seems however to be the case that the explosive growth, a correspondingly high natural mortality rate combined with the fresh water outflow fluctuations, are much more significant factors than the fishing activity for the population dynamics of the species.

The management problem of the fishery therefore could be said to be more precisely described by e.g. the rotation principle in forest economy, than traditional fisheries economy, though without the possibility of changing the rotation period, which by nature is defined as annual rotations.

Closed season regulation (first closing January, later January and February) was introduced in the early nineties and the catches immediately increased. 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. As long as closed season regulation is put in place, it seems to be no danger of resource depletion even in the case of extreme fishing effort. From an economical point of view however, it seems to be a more relevant question to ask how large fishing capacity it should be, than the quota size of a total allowable catch (TAC). The quota regulation therefore does not seem to have any important effect on the total profitability.

This is also the reason why the recent turbulence and lack of control while developing a semi-industrial shrimp fleet, did not caused a more severe situation in the shrimp fishery. As proposed in the Master Plan, priority has been given to the semi-industrial fleet. This has however not been done by reducing the industrial fleet participation significantly, but rather by increasing the total participation in the fishery. The policy change in this area has partly been performed in a non-transparent way, by distributing licenses and changing the framework of the activities. An example of the latter is the allowance of installing freezing facilities on new semi-industrial trawlers, violating the initial objectives of developing a land based processing industry (Degnbol et.al., 2002).

Resource rent primarily continues to be produced the first couple of months after opening and seems in large to be collected by the same operators as before, without seemingly involving additional costs for these operators (Pescamar and Efripel). New operators may get a share of the resource rent or more often probably a normal profit. Some new operators also face difficulties in making a profitable fishery and some already has left the fishery. So called *skipper-effect* is assumed to play an essential role. The specific nature of the biological resource and the fishery, makes it impossible to survive economically in the fishery if you fail to make additional profits (resource rent) the first couple of months after closed season is ended. This combined with the relatively high degree of investments needed, makes it only possible for the successful operators to maintain a sufficient overcapacity to take advantage of the rich fishery the first period after opening. New operators may enter easily by leasing vessels, which involves even higher costs than for the established companies. If resource rent is obtained, it will in most cases probably be collected by the vessel owners.

The investments in strengthening the semi-industrial part in the shrimp fishery has however had some significant results, as a land based processing industry has emerged even though their share of the total shrimp export to the main markets in EU and Japan still is insignificant. The new development has however professionalized the market operations both in the domestic and regional markets. Today catches from local artisanal shrimp fishers also reach regional and even the EU market through local producers in Beira. This partly unexpected spin off from the emphasis put on the semi-industrial sub-sector may turn out to be the most significant result. Even though the quantities are small, some artisanal fishermen do catch shrimp

also during the closed season. This activity is causing frustration and anger particularly in the growing semi-industrial sub-sector, which is struggling to make a profitable fishery.

In principle it seems to be room for several sub-sectors to co-exist and run profitable fisheries on the shallow water shrimp independent of each others. Economic success in this operations require however efficient fishery in the first period after opening. If the producing capacity of each unit is not adjusted toward this period, resource rent is hardly collected. Market access and prices are also essential issues, which are more predictable in such vertical integrated systems as the large operators are parts of. *Mozambican shrimp* is however a well-known quality label, which also new producers can take advantage of and several niche producers have emerged.

Such a rich resource normally will attract rent seekers on all levels where sufficient knowledge of the value and possibilities of rent harvest occurs. Non-transparent allocation of new quotas may indicate hidden agendas and attempts of distributing parts of the resource rent according to these agendas. It seems however to be difficult to reallocate the resource rent as such as long as the main operators are so much more efficient both in the catch operations and in the market integration, than others. From a governmental point of view it should therefore be given great attention to the problem of how to retrieve the resource rent, partly or fully from the main operators. Market solutions, like license auctions or quota auctions, may be considered. It is however necessary to thoroughly analyse possible negative consequences caused by asymmetric information and financial conditions. Both long and short term consequences need to be analysed.

Also other means to adjust the profits of the participating companies to normal levels would impact positively in the management of the fishery. However, to do that will require a great deal of good sense and creativity from the fisheries administration, both regarding the problem of establishing such a situation, but not least in keeping normal profits in the long run. Presently, the fisheries administration gives not attention to this kind of issues. The priority adopted refers exclusively to the increase of rent without a limited consideration of its distribution and impact in terms of management. Economic evaluations are not systematically performed and management decisions are largely based on biological considerations, not empiric economic assessments.

3.3 The kapenta fishery of Cahora Bassa

From the short previous presentation of the history of the kapenta in Cahora Bassa (point 1.5 above) it is obvious that, as in the shallow water shrimp fishery, biologically motivated conservative approach is not relevant. Although the two fisheries differ in the most, the similarity is that they both have almost uniquely economic reasons for fisheries management. If one should experience a collapse in the kapenta fishery, a similar fishery should be able to obtain a few years after a new introduction. In the case of severe reductions caused by increased predator populations, the case could however be different, but currently this is not the situation. The fast turn over rate is of course a key factor here, since the investment of introducing a few hundred kapenta is small since the benefits can be harvested already few (three-four) years after.

The semi-industrial kapenta fishery needs to be regulated in order to correct for the first type of market failure (a free but scarce input factor in production), presented in point 1.2. In a poverty reduction perspective it may be desirable to allocate some resource rent to the employment in the artisanal sector, allowing an open access artisanal fishery to happen alongside with the regulated semi-industrial one. The practical issues this raises have however to be looked thoroughly into on beforehand.

3.4 Crucial regulatory issues

The uniqueness of the two fisheries presented above makes in fact the management problem easier to solve, but the unique properties may also open up for conflicts and rent seeking activities. As long as the closed season regulation is maintained in its present form in the shrimp fishery, it is almost impossible to ruin a positive resource rent production. Other management means therefore can concentrate solely on the distribution of resource rent, rather than as in the normal case, ensure that a positive resource rent may exist.

In the kapenta fishery the situation in principle is the same, since the biological considerations may be left behind when the regulations concentrate on how to distribute the positive resource rent. But in this case, however, the resource rent may be wasted by building up overcapacity of fishing effort. Therefore the semi-industrial fleet needs to be limited if resource rent should be obtained. The regulatory issues in this case, as in most cases, can be separated into

two parts: 1) To ensure a positive resource rent (by limiting the entry), and 2) To decide on how to distribute the resource rent.

When it comes to the distribution of the resource rent (second point above), the two extremes is to take all resource rent from the participants (fishermen and companies) or leave the participants with all the resource rent. In the case of leaving some or all resource rent with the operators, the selection of operators (as in a limited entry fishery) becomes a crucial regulatory issue of a political character. A complete redistribution of the resource rent, as in the case of full governmental collection of the resource rent, in principle simplify the political decisions which have to be made, by placing them into the politically controlled governmental institutions. The major problem of leaving the resource rent with the operators, is however the tendency of overinvestment in the fishing sector, being the primary investing focus of the fishing industry operators. In principle all super normal profits need to be collected in order to establish perfect markets solutions in the long run.

Skilled and competent trawler crew is a scarce resource in the shrimp fishery and consequently the large contingent of expatriate staff in the industrial shrimp fleet represents 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 pass into that direction. Earlier attempts of education Mozambican personal specialized in this industry have not been taken further and need to be revitalized.

In a possible future situation of a perfect labour market, the shrimp fishery economically may be closer to the kapenta fishery. Today it seems however to be super normal profit obtained even when the effort allows to increase at the recent rate, probably because efficient fishing effort units are scarce. It is essential to have this knowledge when imposing regulatory means in order to collect resource rent, as some participants always will be close to a break even situation, or worse: hardly having a positive contribution margin.

3.5 Hypothesis appraisal

- H3.1** *Even though they are not all at the same stage of development, major improvements (in both efficiency and equity terms, as well as opportunities for rent seeking) could be attained in the management of all 4 resources.* The Mozambican fisheries management needs to go through a full evaluation of the specific motivation behind each management mean implemented. In several cases it is difficult to discover the connection between policy objectives and the choice of management means, which often seems to be more based on traditional thinking than on efficient removal of disturbing market failures.
- H3.2** *While public ownership of all natural resources per se does not hinder efficient use and equitable access, the current regulations and their actual implementation have been leading to both inefficient use and capture by elites.* Public ownership (common property) is the main motivation of governmental intervention by management means, as the public ownership without regulations on the fishing activities gives away the fish for free. The alternative (selling out fishing rights for all future) is however worse, economically because the pricing issue is a non-trivial one, but also from political and ethical considerations. The diversity of the Mozambican fisheries calls however on different ways of regulation fisheries efficiently and equally. Open access fisheries play a crucial role in the subsistence fisheries while the resource rent from the highly industrialised fisheries is distributed in a less transparent way. The main effort of improving the regulation system therefore needs to be placed here.
- H3.3** *There is excessive government interference (in part originating from the fact that all resources belong to the government), introducing an unnecessary level of uncertainty, bureaucracy, and unfavourable business environment.* Basically the most important Mozambican fisheries (the kapenta fishery and the shallow water shrimp fishery in particular) needs to be regulated because of the resource scarcity not reflected in a price unless governmental intervention. This is however often mistaken as biological reasoning in major Mozambican fisheries, where a biological calculation of correct quota values are emphasised. This reflects the current understanding and explains the development of a management structure not fitting the actual management problems of these fisheries.

H3.4 *In the areas where the government should have a strong grip, it shows weak capacity.*

The ignorance of Emopesca and the lack of interest in exploiting Emopesca as an instrument of Mozambican fisheries policy is astonishing. After the introduction of joint venture companies in the shrimp fishery, Emopesca was the majority share holder, while it today is reduced down to 30% seemingly not controlled by the Ministry of Fisheries. Hopefully this is reflecting lack of capacity and competence in the ministry, as the other explanations are worse.

4 Governance issues

The Ministry of Fisheries decided in 2003 to promote a revision of the fisheries legislation with emphasis to the *Marine Fisheries General Regulation*. The *Fisheries Law* (from 1990) which is the legal framework for all the fisheries regulations was however not changed. The *Marine Fisheries General Regulation* received some adjustments in order to be more in line with the current situation in the fisheries and the fisheries development policy. In recent years, several regulations have been approved by the government, sport fishing, aquaculture and fish product inspection and quality regulations.

Organisational aspects of the Fisheries sector administration have recently been discussed within the Ministry of fisheries. De Almeida (2004b) describes some imperfections identified by the workshop. Correcting these imperfections are essential in obtaining a more efficient and transparent performance by the different entities that comprise the fisheries administration. They are both structural and functional. The separation between the political and fisheries management components, which implies the establishment of an independent control entity and the clarification of its coordination responsibilities concerning the research, surveillance, fish inspection and fishing ports, are by far the most important and urgent problems to be discussed and solved.

For a more effective fisheries administration, functional aspects (the way the organic bodies relate with each other) are at least as much important as the structural clarification. These functional systems define the relations between the Ministry of Fisheries and the different institutions that carry out the fisheries management and development activities.

4.1 Fisheries statistics

Fisheries statistics may be regarded as an integral part of a MCS system, but is usually treated as an individual body as it goes beyond the narrow control focus of MCS, being a tool for policy making, planning and a key source of general fisheries information. As such fisheries statistics also is an essential part at a MCS system.

Fisheries statistics in Mozambique today is experiencing severe problems. A former online database system is not available any more and updated authoritative statistics does not exist for the last couple of years. Catch statistics exist in several mutually contradictory versions (slightly illustrated by the content of Tables 3 and 4). This applies to most of the key fisheries even though some improvements have been achieved when it comes to collecting catch information from the artisanal sub-sector. There is a strong need to systematise and standardise catch statistics in all sub-sectors.

Catch control is a major problem of different reasons, partly because catches of key species are not landed in Mozambique, as in the case of tuna. This provides the government with less possibilities of controlling size and composition of the catch. It has also been claimed to exist illegal transshipments of catches in open sea, in particular in the shrimp fishery. Shrimp is normally landed in Mozambican ports as packed and frozen products ready for export. Freezer trawlers normally hold inspectors on board in order to ensure the fishery to take place in legal waters, hinder discard and control quality. The discard problem in the shrimp fishery seems to have been significantly reduced by the development of a bycatch market. Artisanal fishermen arrive to the trawlers in order to collect fish and other bycatch products for sale in local markets. Catch control and statistics may however suffer as it may be hard to grasp all possible paths catches may take from each individual trawler. Thirdly and lastly, catches are landed along the long coastline, from lakes and rivers in ways which is difficult to follow. Recorded catches (Table 7) therefore are supposed only to cover about one third of the total Mozambican catches, while the majority of catches is found in catch statistics as lump based estimates of unrecorded catches.

4.2 Monitoring, Control and Surveillance (MCS)

The MCS system in Mozambique today is based on land-based catch control and vessel inspections, partly by catch inspectors on board industrial trawlers. The main focus of the fisheries authorities today is to develop adequate measures in order to manage an individual catch quota system based on a total allowable catch (TAC) approach.

In the case of the shrimp fishery, a vessel monitoring satellite system (VMS) currently is set up. This is a cheap and efficient way of tracing the single license owner (vessel) on sea and in harbour. A full implementation needs also to involve routines on how to merge received data on trawler positioning with corresponding catch and license data. Although the system in principle is simple and less expensive than many other surveillance systems, it provides the managing unit with the possibilities of increased information by utilising different sources.

An evaluation of the MCS system must be seen in close association with its ability to achieve the objectives of management, of their demands on information and in terms of cost-effectiveness. These limitations apply to all fisheries but are especially significant in non-industrialized fisheries. In the case of Mozambican fisheries it may be questioned whether an adequate information base and adequate means of implementation (monitoring, control and surveillance) are available for a TAC based management system. Biological assessments as referred to earlier in the cases of shallow water shrimp and kapenta indicate that strong biological focuses in reasoning expensive MCS actions could be dubious. Control of catch volumes is a very costly and uncertain undertaking in the Mozambican situation. A TAC based management system may thus not be the most effective in the Mozambican situation 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 meeting objectives and lower overall costs.

It is however clear, as demonstrated by recent arrests brought up by “Eagle Star” (an SA chartered patrol vessel), that a certain operational and sanction capability is necessary. Some steps have already been taken to implement an adequate control system partly within the SADC-MCS project. However, Mozambican authorities have little or no ability to respond to reports of illegal fishing by large industrial vessels. It is therefore necessary both to develop the regional

cooperation further as well as the possibilities of utilising the Mozambican sea-going capability in other related sectors as in the coast guard and navy units. The overall perspective of full management cost recover should also apply to the MCS system. Cost recovery is more easily obtained when exploiting the capabilities in other governmental sectors as well as in the region.

It is essential that the legal framework is in line with a feasible and practical MCS solution. Transparency is a key word also in this context as unclear rules and involvement of judgement may open for rent seeing simply because of the large economic interests which are involved.

MCS setup as co-management is expected to lead to higher accept and compliance. It is the policy of the Mozambican government to develop co-management approaches to fisheries management and co-management arrangements have been implemented in some cases in the artisanal sub-sector.

4.3 Fishing Rights

The Master Plan promoted the development of the semi-industrial sub sector, but without establishing a precise definition of the term. In the shallow water shrimp fishery the difference was identified by the use of on board freezers or not. Soon this definition was altered by allowing semi-industrial vessels to install freezers on board after pressure from the new operators. The emphasis put on the semi-industrial sector and the development of land processing units, gave the necessary political support of assigning quotas to new participants.

Allocation of new licenses did not proceed in a transparent way as substantial values were transferred without clear regulation and distribution criteria. It is no secret that this situation caused significant political problems for the fisheries administration, which at the time was a part of the Ministry of Agriculture. It is also a common comprehension that the situation became less tense, particularly in relation to principal donors, after the political decision of establishing a Ministry of Fishery was taken.

The fisheries administration has developed a number of institutions and established regional offices in addition to the central administration in Maputo. This development started when the fisheries administration was a secretariat within the Ministry of Agriculture and the

command structure even today, reflects a situation where the political leadership not is directly involved in decision making and day to day control of the executing bodies. Unclear responsibilities are discussed in a horizontal context rather than decided through a vertical processes starting at the political level. This may be the historical background of the difficulties on clarifying responsibilities and creating transparencies in the decision processes. The political objectives need to be clarified and the organisation directed towards this goals in a straightforward and transparent manner. Obviously resource rent is available in this sector and equally obviously rent seeking activities will exist. This is the reason why governmental management is needed. The resource rent provides in principle the Mozambican society with unique possibilities of developing communities and industries by exploiting internal resources

The legal framework, the institutional structure and the management system need to be adjusted toward improving the capacity of dealing with these tasks. One or two fisheries have the capability of providing Mozambique with a considerable resource rent, while others play important roles as economic buffers by reducing poverty, providing employment, food and income to communities lacking other possibilities.

Priorities given to the semi-industrial sector combined with the confusion regarding this term, have reduced the overall profitability in the shrimp fisheries. Increased capacity for on shore processing is being developed, but the newly entered vessels in the semi-industrial sector are also designed for on board production. Quality control problems related to on shore production has been addressed and significant improvements have been obtained in this area recently.

The well-known problem of objective inconsistency occurs also in the stated fishing policy of Mozambique. In a labour intensive fishery as the artisanal fishery, the objective of reduced rate of unemployment, suggests an open access fishery, which to al large extent is the situation of today. In many cases open access might lead to overfishing in biological terms, but this require a certain capitalisation of the fishing effort. The combination a labour intensive effort production, high biological turn over rates and limited area accessibility (e.g. to open waters) is often found in fisheries which fluctuates due to the economic and demographic situation in the region. Fisheries regulation in these cases will conflict with other objectives, like securing food supply and diminishing level of poverty. The most serious conflicts of objectives are, however,

related to the degree of impact the industrial and semi-industrial fisheries have on the artisanal and subsistence fisheries.

The shallow water shrimp fishery is managed by TERN and quota regulation, which actually are done through license fees similar to a limited entry system. Different management regimes may be rational, but only in case of clearly identifiable and significantly different groups. International access could go through a limited auction system, quotas or licenses, involving joint ventures or others. During the period since the joint venture companies were established the Mozambican part has not been able to develop its share. On the contrary, the formal share is being reduced and Mozambican fishermen are still very scarce in this fishery. The function of the 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 the procedures. Quota management require written and public criteria of quota distribution to ensure predictable and fair systems for the users, but also to secure societal benefits from the natural resources.

Resource monitoring needs be carried out also in cases of open access to the fishery. Catch statistics and collection of data reflecting the fishing effort, should be given priority. Also economical data (in particular second hand market prices) should be collected.

The MCS system is not sufficiently developed to deal with a complicated TAC regime. A satellite monitoring system (VMS) is being implemented and will be an important improvement in the Ministry's possibilities to monitor fishing activities in a cost efficient way. However, lack of cost-efficient means to control quotas may in itself justify investigations of the possibilities to put more emphasis on effort control in the management setup.

4.4 Hypothesis appraisal

H4.1 *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. Implication is enormous opportunities for rent*

seeking and corruption. Obviously this is correct; however regulations and policies in fisheries may include an open access fishery, as in the case of subsistence fishery in Mozambique. This does not necessarily open up for rent seeking and corruption, as long as all other activities, which are regulated, are controlled properly. This is however a major problem. Probably the most promising area for rent seekers is the distribution of fishing rights, being the less transparent area. Today Mozambique is very weak in terms of MCS capability. A strengthen MCS capability will represent a new area of possible rent seeking, as the price of avoiding control may be found in a hidden market.

H4.2 *Licenses and concessions are granted under very un-transparent procedures.* Yes, this is a problem, and even acknowledged by the fisheries administration as such. The lack of clear criteria for quota distribution is considered by the ministry itself as a major problem which presently is looked into. The problem of licensing and quota distribution goes however beyond this issue alone, as the fundamental reasoning behind the allocation of fishing right also needs to be analysed.

H4.3 *Poor communities are effectively alienated from the process of resource allocation, although the law is in principle designed to protect them.* This does not seem to apply in the fisheries case, as the poor communities can enjoy open access fisheries (in case of subsistence fisheries) which in reality represent a way to subsidise employment in the fisheries sector. By this Mozambique takes advantage of available resource rent, exploiting the natural resource as an economic buffer. This valuable property of the natural resources diminishes as the entry/exit dynamics slow down. Since the entry/exit dynamics are believed to be related to the capitalization of effort, fishing as an economic buffer will become less important as poverty is reduced. Currently it is however crucial in many costal communities.

H4.4 *The government is not capable or politically willing to adopt more transparent and economically efficient procedures, perpetuating inefficiencies and poverty.* 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 of doing so. Another problem is the fragile balance obtained with the many interests

involved, which makes any change difficult and only possibly to obtain with a high degree of political authority, which not seems to be developed at this stage.

H4.5 Returns to effective monitoring and enforcement instruments should yield very high returns; nonetheless the government is somehow complacent with the total lack of control over resource use. There is currently a strong wish on the Mozambican side to develop MCS instruments in the fisheries sector. Some of them turn out to be very costly, like patrol vessels and helicopters, but the Master Plan principle of cost recover also applies to the MCS part of the fisheries sector. It is however also other valid considerations relevant in this area, more related to the responsibility of protecting national interests in the open sea. Therefore it is natural to an inter-sector perspective on the MCS issue, which may involve navy and coast guard units. Up to now this kind of inter-sector perspective has been absent, which may be interpreted as the Mozambican authorities has been overlooking this as an issue of protecting national interests. The recent incident when a vessel fishing illegally was brought up may change this attitude.

5 Recommendations

- *The use of **Emopesca as a governmental instrument** needs to be evaluated and clarified in relation to current policy objectives. This also includes full transparency with regards of financial flows and ownership transactions. The Ministry of Fisheries needs to be directly involved as it is the responsible governing institution.*
- *The **financial flows within the fishing sector, the governmental institutions, foreign aid agencies and NGOs** should be analysed 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.*
- *There is an urgent need of **improving the quality and accessibility of essential data** on fisheries and related activities. This includes not only data on catch and effort, but also market data and economic analyses of the main industrial operators.*
- *The specific **motivation of imposing regulatory means** should be evaluated and clarified in each fishery subject to fisheries management. Regulation has to be validated through identification of one or both types of market failure presented above. The use of **fiscal instruments** (such as TERN, export taxation, license fees, etc.) should be evaluated together with other management means*
- *Poverty reducing actions and development within the fishing communities along the Mozambican coast, lakes and dams, should **not targeting fishing and related activities alone**, by e.g. giving financial advantages to these specific activities. All governmental interventions should be general in order to ensure sound and sustainable communities based on the natural favourable conditions. Economic development of community should not discriminate between industries, but fall equally to all parts of the community.*
- *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.*

- *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 nationalisation of this fishery.*
- *The fishery policy needs to be based on **clear and consistent political objectives**. A listing of all good goals is not sufficient, since goal conflicts often exist. These objectives first and most need to be in line with the overall objective of poverty reduction.*
- ***Allocation of fishing rights (quotas or limited entries) should be based on clear and transparent criteria**, which is not the current situation. These criteria, as the management means, need to be consistent with the political objectives of the sector.*
- *A **MCS plan including both inter-sector and regional perspectives** should be elaborated. 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.*

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Annex 1

An Economic Analysis of Natural Resources Sustainability in Mozambique

Terms of Reference

Motivation

Mozambique is richly endowed with natural resources. Out of a total land area of 780,000 km², 620,000 km² are covered by some vegetation, with 87,000 km² in protected areas. The total commercial volume of industrial wood is estimated at 22 million m³, with an allowable annual cut of 500,000 m³. Thirty six million hectares of arable land spread over 10 different agro-ecological zones, with one tenth being prone to irrigation. The country has over 5,500 plant species, 220 mammals, 690 birds, many of which are endemic. The 2,700 km long of coastline offer enormous opportunities for tourism development, as well as economic opportunities for some 80,000 Mozambicans who depend of fisheries related activities. The sector exported 11.9 thousand tons of fish products in 1999, worth US\$ 76.8 million, which represented 40% of the country's export earnings that year. The country is also well endowed with water resources, although subject to intense floods and droughts and relatively poor balance across regions and populations.

It is widely accepted that future economic growth of the country will continue to rely on its natural resource base. This is because the current product is largely dependent on these resources, and the structure of the economy will not change significantly in the short term. It is also a common perception that protection of the natural resource base may retard or lower economic growth or poverty reduction alternatives in the short term – a classic dichotomy between environment and growth – which is not to be entirely discarded in a country as poor as Mozambique. Indeed, any trade-offs between present and future consumption of resources have to be carefully analyzed.

The government of Mozambique is clearly concerned with the long term sustainability of its economic growth. The country has succeeded in implementing major macroeconomic reforms in agreements with the IMF and the World Bank, and this has caused major short term social costs (e.g., limited investments and job losses). These social costs are largely accepted, at least by the economic core of the government, as necessary conditions for the country to maintain a sustainable growth pattern. The question then is why are not the eventual limits to growth imposed by the regenerative and assimilative capacities of natural resources accepted as necessary conditions to be respected if the country is interested in ensuring that sustainable growth pattern.

Each natural resource presents unique features as well as different evolution patterns in terms of issues such as policy frameworks, institutional designs, enforcement capacity, etc. For instance,

while the current key issue in water resources management is access to the resource, in the case of land, forestry and fisheries the main problem is one of definition and enforcement of property rights. While most land, forests and few fish species are underutilized or under-exploited, other major fish species and many aquifers are nearly exhausted or unsuited for consumption. Despite these individual features, there are major overall common issues in the management of natural resources in Mozambique.

There is a substantive amount of studies and reports on individual natural resources – particularly on land, forestry, fisheries, and to a lesser extent on water. Nonetheless, major knowledge gaps remain on the economics and the political economy of their use. Studies on NRM attempting 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

The study will analyze from an economic perspective some of the key issues in natural resources management (NRM) in Mozambique, giving particular emphasis to sustainability of their utilization, impacts on poverty and governance issues related to the management of resources. It will focus on four major resources – land, water, forests and fisheries. They were selected fundamentally because they are perhaps the four economically most important natural resources in the country, as well as because they share major theoretical properties in terms of their economic use, so that many common principles apply in policy design.

Given the enormous range of issues involved in the management of these four resources, the study has to be very selective. It will attempt to look at common issues and problems involved in the management of those resources. Based on a summary review of existing studies and on preliminary consultations with government and non-government institutions in the country, it was decided to concentrate on three broad sets of issues: (i) basic economics of the sectors (including growth potential and poverty links), and forgone incomes associated with the current NRM policies and strategies; (ii) regulatory and incentive gaps and failures (typically associated with either too much or too little government intervention); and (iii) governance issues (i.e., the practical implementation of policies and the government's political commitment to promote sustainable resource use).

Specific issues and questions to be addressed

I. Basic economics of the sectors and rough estimates of forgone incomes due to current policies

The objective is to provide policy makers with approximate values of the costs and benefits of adopting sustainable and unsustainable strategies. The consultants should make and spell out scenarios and assumptions underlying the estimates.

Underlying hypotheses:

The consultants should discuss the following hypotheses (as they apply to some or to all four resources):

- the government may be abdicating significant revenues with unclear benefits;
- the system may be promoting and perpetuating inefficiency in the domestic industries;
- the main beneficiaries of such policies are not typically the poor;
- even gross figures of such forgone incomes are not known by the economic sectors of government and perhaps not by society more broadly.

Fisheries: summary review of sector economics (income, employment, investments), with some analysis of growth potential and poverty indicators; for the three principal species estimate the differences between production values and royalties under current conditions and those which would be based on optimum TAC and alternative royalty values (more in line with international practice). Estimate likely revenues arising from a system where quotas are tendered as opposed to grand-fathered (try to incorporate efficiency gains eventually induced by such system). Compare royalties with international prices. Discuss the main beneficiaries and main losers of current system.

Forestry: summary review of sector economics (income, employment, investments), with some analysis of growth potential and poverty indicators; for major species assess current royalties and license fees in comparison to international competitors and international prices. Estimate forgone revenues with current system and production levels. Discuss the main beneficiaries and main losers of the current system.

Water: The government has two tariffs for (bulk) water use (M\$ 4,000/m³ for agriculture and M\$ 7,000/m³ for industry and urban consumption). Under any perspective these values are extremely low, and water infrastructure has (as a consequence?) deteriorated. What are the forgone revenues (based on current levels and types of main uses)? Apart from the subsidies, implications may be severe health costs. Estimate incidence and costs associated to waterborne diseases. Discuss main beneficiaries and main losers of the current system. Data permitting, make an overall assessment of the costs associated with both droughts and floods.

II. Regulatory and Incentive Gaps and Failures

The objective is to make an assessment of the existing regulatory frameworks of the 4 sub-sectors, to draw common lessons, identify major areas of concern (in terms of inefficient and/or unsustainable uses, anti-poor outcomes, etc.), and to make recommendations of improvements, taking into consideration the prevailing social, political and institutional conditions.

Underlying hypotheses:

The consultants should discuss the following hypotheses (as they apply to some or to all four resources):

- even though they are not all at the same stage of development, major improvements (in both efficiency and equity terms, as well as opportunities for rent seeking) could be attained in the management of all 4 resources;
- while public ownership of all natural resources per se does not hinder efficient use and equitable access, the current regulations and their actual implementation have been leading to both inefficient use and capture by elites;
- there is excessive government interference (in part originating from the fact that all resources belong to the government), introducing an unnecessary level of uncertainty, bureaucracy, and unfavorable business environment;
- in the areas where the government should have a strong grip, it shows weak capacity;
- in the specific case of lands, there is a major incentive for speculation and extremely high rents obtained by the immense difference between fees and tariffs and actual opportunity cost of the land.

Fisheries: for the main products (including deep- and shallow-water shrimp) evaluate the concession system for the industrial and semi-industrial fleet. This includes issues such as the structure of the industry, the reasons for quotas not being tendered, the implications of the semi grand-fathered allocation of quotas, review the revenue collection system (values and allocation of revenues); propose alternatives for introducing an effective monitoring system; identify and discuss the problems and potential conflicts with artisan fishermen; discuss alternatives for improving the system.

Forestry: evaluate the current concession and licensing system in terms of the fees and stumpage values adopted, their collection and utilization, concentration of (good quality) forests, incentives for industry verticalization and greater efficiency, security of rights, unclear attributions between central and local governments; propose alternatives for introducing an effective monitoring system; discuss alternatives for improving the system.

Water: evaluate the overall effectiveness of the existing regulatory framework in terms of the charging system, financing gaps, maintenance and capacity to expand infrastructure, (potential) effectiveness of the ARAs and the proposed basin committees, the international rivers conflicts. The consultants should compare the WRM system with the existing regulatory framework of the sanitation sector and their linkages. The consultants should also make an assessment of access to rural water, including access and the inexistence of regulations and monitoring of underground water. Discuss alternatives for improving the system.

Land: evaluate the overall effectiveness of land policies in Mozambique. This includes the outcomes in terms of (in principle) inexistence of land markets (but assess existence and incentives for “off-the-records” transactions), promoting efficient use, disincentives for making investments in the land, promoting an equitable distribution of good lands, the values of licenses and fees, different rules for national and foreign applicants, assess implications to urban lands (since the law fundamentally focuses on rural land), potential conflicts between land use rights and land use permits. Implications of the current tenure system in terms of exacerbating inequality (access to (better) lands). Discuss alternatives for improving the system.

III. Governance Issues

It is unquestionable that the legal framework in Mozambique is designed to protect the poor, and this applies not only to natural resources management. Nonetheless, between the Constitution, the laws, regulations, and final implementation and enforcement there is a myriad of factors leading to quite poor outcomes. The objective of this part of the work is to assess the actual implementation of NRM policies, identify and assess the numerous opportunities for rent seeking and to make proposals for improving implementation and minimizing deviations from the law.

Underlying hypotheses:

The consultants should discuss the following hypotheses:

- 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. Implication is enormous opportunities for rent seeking and corruption;
- licenses and concessions are granted under very un-transparent procedures;
- poor communities are effectively alienated from the process of resource allocation, although the law is in principle designed to protect them;
- the government is not capable or politically willing to adopt more transparent and economically efficient procedures, perpetuating inefficiencies and poverty;
- Returns to effective monitoring and enforcement instruments should yield very high returns; nonetheless the government is somehow complacent with the total lack of control over resource use (all four resources).

Fisheries: for the major species, discuss the system of allocation of quotas (why is a tradable quota system not implemented?), the “socioeconomic” criteria for increasing the TAC proposed by IIP and that actually adopted, the extreme ineffectiveness of the monitoring system, the argued inability of the government to significantly raise licenses and royalties, the incentives which ultimately perpetuate the incapacity of the local industry to become competitive; discuss

the likely major beneficiaries of such a system and propose alternatives to minimize rent seeking and to effectively monitor the industry.

Forestry: discuss the criteria for conceding licenses given the incapacity of proponents to prepare “sustainable management plans”, discuss the extreme discretion by government authorities conceding licenses and concessions, the actual process of consultation with local communities (including their representation), the inability and implications of government significantly raising licenses and fees; discuss the likely major beneficiaries and propose alternatives to minimize rent seeking and to effectively monitor the industry.

Water: contrary to the other 3 resources, in the case of water there appears to be a gap (as opposed to excessive government interference), at least in terms of actual regulation and implementation of the 1991 Water Law. In terms of governance, the fundamental issue is the “incapacity” of government to introduce charges for water access (or to charge in cases where there is capacity to pay). Among the major likely implications are the incapacity to monitor the system, leaving the more vulnerable populations exposed to extreme events and without access to good quality water. Make an assessment of this problem and propose alternatives to improve the system.

Land: assess the criteria adopted for conceding licenses and the extreme discretion laying with government authorities, assess the increasing tendency of speculation (in face of an expectation that rules will become flexible and/or in anticipation of future land use projects), assess the information asymmetry between project proponents and local communities; propose alternatives to minimize governance problems and improve the system.

Timeframe and Work Program

The work will be conducted by four senior natural resource economists who will work in partnership with the activity TTL. They will have access to existing publications and written material. They will be hired for a period of 4 weeks each. A 2 week mission to Mozambique will take place between April 19 and April 30, 2004. The consultants should prepare in the field a draft report addressing the issues raised in the present TORs. A final report should be submitted by May 21, 2004.