

## **Opportunities and Options for Financing Fisheries Management in Uganda:**

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### **Abstract**

This report examines, from an economic perspective, arguments for introducing cost recovery in the Ugandan fisheries and the type of charges that would be appropriate. It considers their likely implications for the Ugandan fishing industry as well as their impact on the economic efficiency of both the fishery and fisheries management services. In recent years, fisheries management in Uganda has been hampered by a severe lack of finances. Currently, the government provides only 7.8% of the estimated requirements for fisheries management services. A well designed cost recovery system offers the opportunity for a proper financing of fisheries management in Uganda. The study outlines a cost recovery system to finance fisheries management in Uganda. This system, tailored to the administrative structure of fisheries management provision in Uganda, is based on a combination of input, output and access charges depending on the level of government providing the fisheries management services. The study investigates the ability of the system to recover sufficient funds for financing fisheries management and the final incidence of the chargeable contents

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## EXECUTIVE SUMMARY

1. Cost recovery is a technical term used to describe the process of charging the fishing industry for the public costs of providing fisheries management services.
2. This report examines, from an economic perspective, arguments for introducing cost recovery in the Ugandan fisheries and the type of charges that would be appropriate. It moreover considers their likely implications for the Ugandan fishing industry and its efficiency.
3. Currently, fisheries management (research, design and implementation of management rules, and enforcement) in Uganda is severely under-funded. The current annual budgetary allocations, excluding donor support, are only about 7.8% of the annual requirement.
4. This under-funding of fisheries management services stands in sharp contrast with the fact that the fisheries sector contributes significantly to the Ugandan economy. The sector is currently the third largest foreign exchange earner after coffee and tourism. It is also clear that the fisheries industry in Uganda is generating substantial rents.
5. Cost recovery is considered to be an option that could provide adequate financing for fisheries management in Uganda.
6. There are three main reasons why cost recovery is considered important.
  - (i) For anything less than fully efficient, cost recovery will enhance the economic efficiency of the fishery.
  - (ii) Cost recovery generates incentives (for those paying the costs) to demand better services and this may contribute to more efficiency in the provision of these services and fisheries management in general.
  - (iii) Cost recovery reduces the need to finance fisheries management by distortive public tax revenues.
7. There are principally three main categories of cost recovery charges that can be applied to a fishery. Charges can be applied on;
  - (i) access to the fishery,
  - (ii) effort units or use of inputs on the fishery, and
  - (iii) output of the fishery.

The analysis of effects on each reveals that charges on effort units can be set so as to generate the same amount of recovered costs as charges on output or access.

8. A number of countries, including Australia, New Zealand, Iceland and Canada, have introduced cost recovery in their fisheries. The cost recovery arrangements have worked well and are getting more common.

9. Estimation of fisheries management costs indicate that fisheries management costs as a proportion of the value of landings range from as low as 3% to more than 30%. In Newfoundland it varies between 15% to 25%, while in Norway it dropped from 13% to 8% because of increase in the value of landings and only 3% in Iceland. Commonwealth fisheries of Australia, it is averaged 7.2%.
10. This study proposes a cost recovery system to finance fisheries management service in Uganda. This system is to be constituted at national level, district level and community level.
  - (i) At national level,  
A cost recovery charge on the issuing of industrial fish processing licence shall be imposed. The national level charges shall finance national level based activities
  - (ii) At district level,  
A cost recovery charge on the issuing of fishing vessel permits and fisherman's licence shall be imposed. District level charges shall finance district-based activities.
  - (iii) At community level,  
A cost recovery charge on the value of landings shall be imposed. The community level charges shall finance community-based management activities.

The revenue using this system falls short of the estimated cost of fisheries management by about US\$1.2 million.

11. The study of the impact of this cost recovery system has been limited to two issues. They include;
  - (i) Ability of the system to recover sufficient funds to finance the costs of fisheries management services; and
  - (ii) The incidence of the charges proposed in the system to the fishery – who actually pays the charge?

On the first impact, the study proposes that it would be wise to implement the cost recovery in phases to allow a gradual transition from the current situation of no cost recovery to 100% cost recovery. This helps the system to generate general acceptance and support especially from the beneficiaries of management services, who are also the payers of cost recovery charges. The system is designed to be able to recover all costs of fisheries management. On the second impact, it looks evidently clear that the proposed charges will create a burden to some sections of individuals within the fishery. Looking at each charge proposed in the cost recovery system, it is most likely that the burden of the charges will be borne by fishermen in the fishing industry.

## 1 INTRODUCTION

Achieving and maintaining sustainable fisheries production requires an efficient fisheries management regime. Such a fisheries management regime is inevitably costly. Financing fisheries management through cost recovery has of late generated a lot of attention in many fishing nations in the world. Cost recovery (following Hatcher and Pascoe 1998) means charging the fishing industry for the public costs of fisheries management. Although fishermen or fishing firms incur private costs such as purchase of fishing gear, the depreciation of capital, the crew's wages etc, there are also public costs, which are associated with managing or regulating the fishery. These include research costs, monitoring and surveillance costs and costs of designing and implementing fisheries management rules.

There are a number of reasons why cost recovery in fisheries is considered important. *Firstly*, well-managed fisheries usually yield economic rents<sup>1</sup>. Financing such fisheries is like subsidising an industry that would otherwise finance itself. It is not economically justifiable to collect money by distortive taxation to subsidise a profitable industry.

*Secondly*, cost recovery can generate a stronger incentive (for those paying the costs) to demand better services and this may contribute to more efficiency in the provision of these services and fisheries management in general. If the fishermen or fishing firms pay for the costs of fisheries management, the management service providers will come under more pressure to deliver these services at the time and of the quality required. This reduces or eliminates wasteful financial allocation to services that may not be of major importance to the fishery but rather benefits the fisheries managers. Fisheries managers may therefore be induced to adopt cost effective methodologies to deliver fisheries management services.

*Thirdly*, cost recovery reduces the need to finance fisheries management from public tax revenues. Economic theory reveals that taxes are generally distortive. In principle, cost recovery means that non-distortive taxation is substituted for distortive taxation.

Currently, fisheries management in Uganda is severely under-funded. This implies that management services are less than optimal. In the last decade or so, the Fisheries Resources Department has experienced irregular and insufficient resource flows from the Ministry of Finance to finance fisheries management functions. Out of the total budgetary requirement of about 3.9 billion Uganda shillings (US \$2.3 million) annually, the Fisheries Resources Department has been receiving less than 50 million Uganda Shillings annually (approximately US\$ 0.03 million) from the Ministry of Finance, representing 1.3% of the annual total requirement. The budget was only increased this financial year (2000/2001) to about US \$0.2 million, which is approximately 7.8% of the annual requirement. This gap between the estimated needs and the actual allocation is substantial. The variability of allocations between years

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<sup>1</sup> An economic rent is the maximum economic surplus that can be extracted from the fishery while the fishing industry continues to operate efficiently. One rationale for extracting some or all of the potential rent from the fishery is based on the premise that the fish stocks represent a national resource and that society as a whole should receive a share of the benefits from their exploitation.

illustrates the uncertainty of the funding, and emphasises the difficulty of planning for fisheries management services.

It should be noted that donor development programs have subsidised fisheries management in Uganda. Although this donor intervention is substantial, it leaves the funding gap uncovered and more importantly it is unsustainable. This renders some of the management activities not undertaken and thereby leading to some imperfections in carrying out the management roles.

This under-funding of fisheries management services stands in sharp contrast with the fact that the fisheries sector contributes significantly to the Ugandan economy. The sector is currently the third largest foreign exchange earner after coffee and tourism. It is also clear that the fisheries industry in Uganda is generating substantial rents. Cost recovery in fisheries can therefore, not only capture some of the resource rents to finance fisheries management but can also reduce or replace the reliance of financing fisheries management on the general tax revenue.

Cost recovery can be seen as an opportunity for shifting the burden of financing fisheries management from the central government treasury to let the industry pay for its costs of management. The question to be answered is how government can use cost recovery as an approach to establish an appropriate and sustainable financing mechanism for the management of fisheries in Uganda. Answering this question would contribute to more efficiency in delivering fisheries management services in Uganda.

This study report is arranged in six main sections. Following this introduction, section *two* provides background description of the Uganda economy describing the economic structure and general statistics for the entire economy. The same section provides a summary of the characteristics of the Ugandan fishery and some of the problems facing the fisheries industry. The last part of this section describes an evolution and status of the current fisheries management regime in Uganda.

The *third* section opens by developing a theoretical rationale for cost recovery in fisheries and later examines the nature and constitution of fisheries management services. Cost recovery options and their theoretical implications on catch and effort equilibrium are discussed. The last part of this section sites some country specific examples where partial or full cost recovery has been implemented.

Section *four* describes a particular proposal for a cost recovery system in Uganda. It attempts to propose the institutional framework for implementation and utilisation of the recovered revenues for fisheries management. The section estimates the possible costs of fisheries management and estimates how much the system is likely to recover. The implications of the cost recovery system to the fishery are also explored.

Section *five* investigates the ability of the system to recover sufficient funds for financing fisheries management and the final incidence of the charges.

Section *six* draws some conclusions and attempts to generate recommendations for action.

## 2 BACKGROUND

### 2.1 The Ugandan economy

Uganda is a landlocked country with a total surface area of 241,038 km<sup>2</sup>. It has a population of about 21.1 million (1999) with a recent growth rate of about 2.9% per annum. This rapid population growth puts great pressure on the natural resources of the country, which calls for effective management in order to ensure their sustainable use. Uganda has achieved remarkable economic growth during the last decade and a half with GDP at 7.7% in the 1998/99 financial year. During the past decade, the country has embarked on policies of economic liberalisation, privatisation, fiscal discipline and broad-based public sector reform programs, according to the Ministry of Finance Planning and Economic Development (MFPED 2000a). This is probably the reason for the favourable growth trends.

Uganda's economy suffered severe economic decline during the 1970s and in the early 1980s to the extent that by 1985, per capita GDP had fallen by 43% (compared to the 1970s) and inflation was almost 300% per annum. After a period of economic collapse and social anarchy in the years 1970-85, Uganda started implementing some of the economic reform programs proposed by the International Monetary Fund (IMF) and the World Bank (MFPED 1998). The two Bretton Wood institutions have since described Uganda as one of a few success countries in Africa. The reform programs produced impressive results, including most notably the achievement of positive, sustained GDP growth of almost 6.6% over the past decade (MFPED 1999). Real GNP per capita was US\$320 in 1999 compared to an average of US\$160 during the 70s and early 80s. This may be compared to the African average GNP in 1999 of US\$684.

#### 2.1.1 *The structure of the economy*

The Ugandan economy is characterised by a number of production sectors, the most important of which are: Agriculture, Animal Industry and Fisheries; Mining and Quarrying; Manufacturing; Energy sector (electricity & water); Commerce; Transport and Communication; Construction and Community Service.

The agricultural sector is composed of three main sub sectors. They include crops, fisheries and livestock. In the crop sub sector, the traditional crops that contribute to overall Gross National Product (GNP) include coffee, sugar, tobacco, tea and cotton. Other crops, such as maize, fruits, millet, flowers etc. are categorised as non-traditional crops.

Industrial production includes beer manufacturing, spirits, saw milling, iron and still production, food processing, soap and food manufacturing, tea processing, meat, vegetable, and oil production among others.

The construction and mining sectors are also among the sectors that contribute largely to the Ugandan economy. Construction is mainly public roads and private buildings. In the process and as a linkage, the construction sector influences the mining sector as the former requires inputs like cement, sand and clay thereby expanding the mining and quarrying sector. There is also the service sector that includes road, rail and air

transport, postal services, telecommunication, commerce and community services. The energy sector is also among the leading sectors in the economy especially the generation of hydro electric power which has lead to Uganda exporting some percentage of electricity generated to neighbouring countries of Kenya, Tanzania and Rwanda. Table 1 shows GDP numbers and growth rates of major sectors of the economy for the financial years 1996/97 - 2000/2001.

Table 1: GDP at factor cost (Uganda shillings millions) at constant (1991) prices and the growth rates for 1996/7-2000/01 (MFPED 2001).

Period	1996/97	1997/98	1998/99	1999/00	2000/01
Agriculture; Livestock & Fisheries	1,317,851 1.1%	1,342,828 1.9%	1,434,573 6.8%	1,494,182 4.2%	1,567,553 4.9%
Mining and Quarrying	17,033 50.5%	22,040 29.4%	23,332 5.9%	24,504 5.0%	25,938 5.9%
Manufacturing	256,362 13.4%	293,393 14.4%	329,852 12.4%	333,882 1.2%	341,895 2.4%
Electricity/water	29,763 10.1%	31,846 7.0%	33,774 6.1%	36,351 7.6%	38,902 7.0%
Construction	229,848 7.2%	247,301 7.6%	273,039 10.4%	297,320 8.9%	322,489 8.5%
Commerce	436,197 7.7%	462,575 6.0%	505,562 9.3%	519,348 2.7%	531,321 2.3%
Transport and communication	148,349 10.6%	163,121 10.0%	176,009 7.9%	190,513 8.2%	207,670 9.0%
Community services	459,722 6.3%	487,079 6.0%	510,153 4.7%	543,026 6.4%	574,653 5.8%
Owner occupied dwellings	86,828 8.0%	92,906 7.0%	100,338 8.0%	107,864 7.5%	115,414 7.0%
<b>Total Gross Domestic Product</b>	<b>2,981,953</b>	<b>3,143,089</b>	<b>3,386,632</b>	<b>3,546,990</b>	<b>3,725,835</b>
<b>GDP growth rates</b>	<b>4.5%</b>	<b>5.4%</b>	<b>7.7%</b>	<b>4.7%</b>	<b>5.0%</b>

Ministry of Finance officials have projected the economy to grow by an average of 5% during the financial year 2000/2001. This indicates that the growth rate is expected to be higher than that recorded in the previous financial year. This is attributed to the non-coffee export sectors such as tourism, fishing, telecommunication and electricity that have displayed strong growth. Figure 1 illustrates growth trends of the major sectors of the economy in percentages for the financial years 1998/99 - 2000/01.

### 2.1.2 Some basic human development indices

Uganda is in 158<sup>th</sup> position, of 174 countries ranked, in the United Nations Human Development Index (HDI) in the world (UNDP 1999). Total labour force participation in 1999 was 48.5% of the total population. The urban population was 13.9% of the total population compared to an average of 37.1% for Africa and 75.8% in developed countries. In 1992, 36.7% of the total population lived on below US\$1 per day.

Total life expectancy at birth was 43.8 years in 1999 while infant mortality rate (per 1000) was 96.7. Out of the total GDP, Uganda spent an average of 1.6% annually on health and other related services between 1993 and 1998 compared to an average of 2% for Africa and 6.3% for the developed countries.

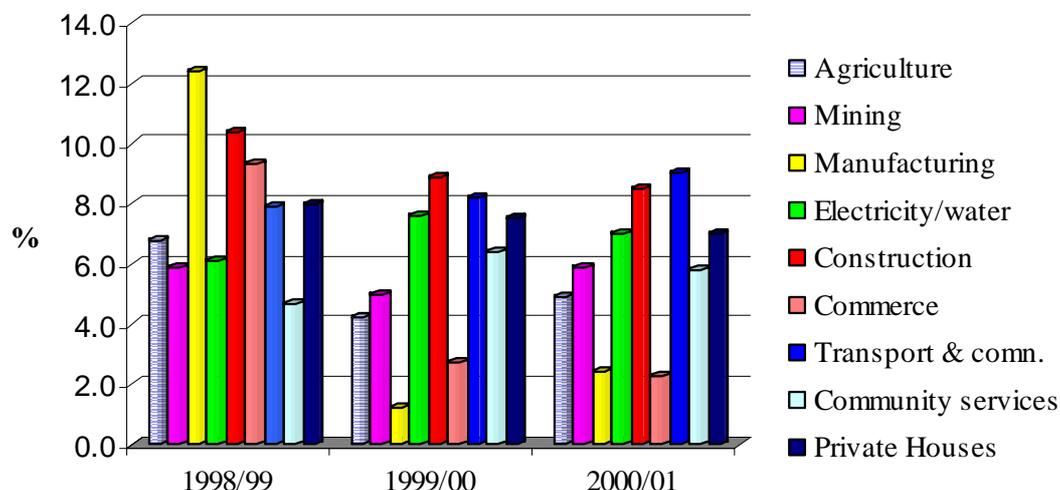


Figure 1: Sector performance in percentages 1998 - 2001

### 2.1.3 Overall balance of payments position

For the financial year 2000/01, the balance of payments position was projected to be in surplus by US\$15 million, following a deficit of US\$93 million in the previous financial year. The projected substantial increase in official transfers in 2001/02 was expected to offset the declining coffee receipts in the previous year thereby improving the current account deficit from 9.2% of GDP in 1999/2000 to an estimated 8.4% in 2000/01. MFPED (2001) also reported an expected increase in foreign exchange reserves at the Central Bank by US\$81 million in the 12 months to June 2001.

### 2.1.4 Debt position and servicing

As of June 2001, the ministry of finance estimated the Uganda's current debt at US\$3.6 billion while debt service due was US\$145.5 million in 2000/01 (MFPED 2001). In 1991, Uganda's request for debt relief from the Paris Club of Creditors was granted. The relief was however insufficient for Uganda to sustain its debt position. As a result, the World Bank provided funds for Uganda to buy back all its commercial credits at a discount rate of 88% in 1993. The International Monetary Fund (IMF) and the World Bank also implement the Highly Indebted Poor Countries (HIPC) initiative to enable all HIPC countries to access sufficient debt relief to reduce their debt burden to sustainable levels. Uganda was the first country to benefit from the HIPC debt relief initiative in 1998 when it was granted debt relief of US\$347 million in Net Present Value (NPV) terms (equivalent to US\$650 million in nominal terms to be spread over a period of thirty years).

The economic performance described above is attributed to a combination of Uganda's economic policies and programs that emphasize growth and efficiency. Poverty reduction and environmental protection are the overriding principles for Uganda's economic growth. The broad policies now in place include:

- (a) Structural Adjustment Programs (SAPs) initiated in 1987 for economic recovery and accelerated economic growth. Uganda is among the most successful implementers of SAPs in Africa as indicated by the above mentioned achievements in macro-economic stability and economic growth.
- (b) National Environmental Action Plans (NEAPs) initiated for natural resources conservation and environmental protection.
- (c) Poverty Eradication Action Plan (PEAP)<sup>2</sup> of 1996 is based on four pillars (Blake and Kebba 2001 and MFPED 2000b), namely: (i). Creating a framework for economic growth and structural transformation, (ii). Ensuring good governance and security (iii) increasing the ability of the poor to raise their incomes and (iv) increasing the quality of life of the poor.

These policy initiatives have contributed towards Uganda's development targets of increasing household income and real GDP per capita. It is also important to note that the reform programs of liberalisation, privatisation, decentralisation and civil service reform have created an enabling environment and institutional space for delivering management services. The challenge now is to reduce public expenditure on some of the production sectors, especially where such sectors can generate their own revenues to finance their budgets.

## 2.2 The fisheries sector and its characteristics

The fisheries sector is among the sectors in the economy that have benefited as a result of economic reform programs in the recent past. The sector is comprised of both capture and aquaculture fisheries with the former contributing most of the total production. The capture fishery is basically artisanal<sup>3</sup> while aquaculture is not yet commercialised but primarily contributes to household food in some areas. Total annual fish production is currently lower than the Maximum Sustainable Yield (MSY) estimated at 330,000 metric tons (MAAIF 1999). The highest total catch was realised in 1993 at 276,000 metric tons. What may not be clear is whether the current catch numbers are yet to reach MSY (of 330,000 tons) or if it has surpassed the MSY

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<sup>2</sup> There is also PEAP related but sectoral specific to Fisheries which is the Plan for Modernisation of Agriculture. This is a strategic framework for eradicating poverty through modernising agriculture including fisheries. It is important to note that fisheries in Uganda is categorised under the agricultural sector because of the Ministerial rationalisation of Agriculture, Animal Industry and Fisheries under one Ministry.

<sup>3</sup> The term artisanal in fisheries may have different connotations in different socio-economic contexts. The definition in this context therefore is the one adopted by FAO (1995)

since catch trends indicate declining stocks.<sup>4</sup> Figure 2 shows total current fish production 1990 – 1997.

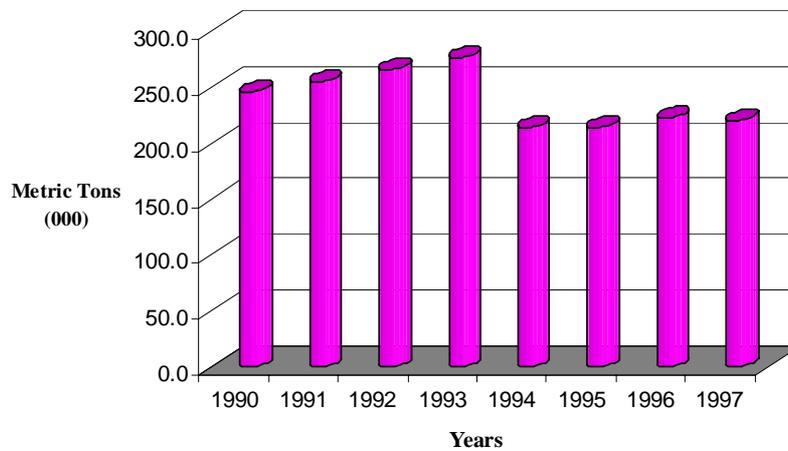


Figure 2: Total Fish Production from all the water bodies in Uganda '000 metric tons 1990 - 1997 (data source MAAIF 2001)

The largest and most economically significant water body in Uganda is Lake Victoria with a surface area of 68,000 km<sup>2</sup> is shared with Tanzania (49%) and Kenya (6%) leaving Uganda with the remaining 45%. Other large water bodies include, Lake Albert (5,270 km<sup>2</sup>), Lake Kyoga (2,700 km<sup>2</sup>), Lake Edward (2,300 km<sup>2</sup>), and Lake George (250 km<sup>2</sup>) along with the River Nile see figure 3



Figure 3: Map of Uganda showing major water bodies

<sup>4</sup> It is possible that the catches are below MSY because of depressed stocks. The trends in catch do not seem to indicate that an increased effort can increase harvests.

Recent statistics indicate that artisanal fish production reached 229,400 mt in 2000 with Lakes Victoria and Kyoga accounting for 80% of the catches. The Nile perch (*Lates niloticus*) has dominated Ugandan fisheries over the past two decades accounting for 60% of the catches by volume (MAAIF 2001). Other major species harvested include; sardine or *mukene* (*Rastrineobola argentea*) at 20%; the Nile Tilapia (*Oreochromis niloticus*) at 10%; and other species (of the genera *Bagrus*, *Clarias*, *Protopterus*, *Barbus*, *Synodontis*, *Momyrus*, *Alestes* and *Labeo*) accounting for the remaining 10% (MAAIF 2001). Figure 4 shows the recorded catch by origin in 1997.

Capture fisheries in Uganda is characterized by plank canoes and to a lesser extent, fibreglass boats. Some dugout canoes are also still being used. The plank canoes are generally 4 to 12 m in length and dugout canoes average 3.5 m.

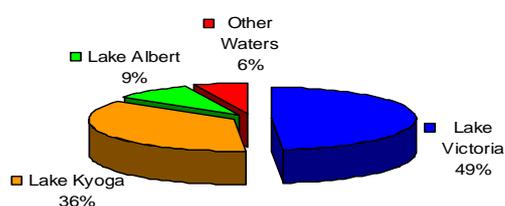


Figure 4: Fish Catch by Water Body - 1997 (data source MAAIF 2001)

The total number of vessels is about 17,000 and about 20% of these are motorised. Artisanal fishermen utilise various gears including gillnets, seines and hook and line. In a number of localities, traditional methods including baskets, traps and mosquito nets continue to be used.

As indicated before, the fishing industry in Uganda plays an important economic role in the development of Uganda. The sector has assumed an even greater profile with the advent of the Lake Victoria Nile perch (*Lates niloticus*) fishery. The export of the Nile perch fillets started in the late 1980's. This trade grew from US\$1.4 million in 1990 to US\$46.9 million in 1998. There are currently 8 industrial fish processing plants in operation with a combined processing capacity of 300 metric tonnes of fish per day. Some 500,000 Ugandans are involved in fisheries-related employment.

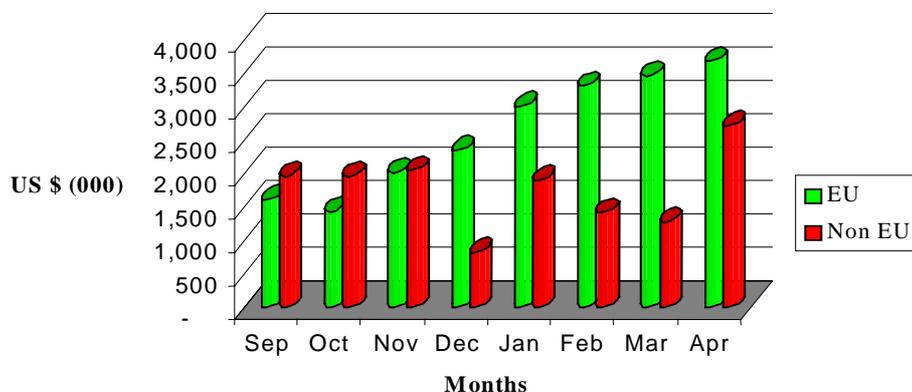


Figure 5: Uganda's Fish Exports in 2000 – 2001 to EU and Non EU countries

Approximately 100,000 are involved in the harvest sector as fishermen, crew, and/or boat and gear owners and 400,000 are engaged in secondary or tertiary sectoral activities relating to processing, trading and the provision of miscellaneous support services. Fish is an important source of animal protein (15%) available to the national population (MAAIF 2001).

### *2.2.1 Problems in the fisheries sector*

Problems in the Uganda capture fisheries are largely management and quality related. Fisheries management related problems include declining catches due to excessive fishing, use of destructive fishing gear and methods and degradation of fish habitats due to eutrophication and pollution of lakes. There is also lack of regulatory frameworks, which is partly due to insufficient funding for management services, a problem with which this study is specifically concerned.

The fisheries sector has also suffered quality-related problems. In the last two years, for example, the fish export business experienced a ban on fish exports to the European Union market that lasted for 18 months beginning March 1999. Ministry of Finance reports that this resulted in an estimated loss of US\$30 million of exports. Following the lifting of the ban, exports have recovered and the exports to the European market show an increasing trend as illustrated in figure 5.

In the fish-farming sector, there is a notable lack of business-oriented skills to help the fish farmers to progress from the traditional and subsistence fish farming to commercially oriented aquaculture.

## **2.3 Fisheries management in Uganda**

### *2.3.1 Evolution of fisheries management*

The history of fisheries management in Uganda is not well documented. However, some pieces of information provide an overview of the evolution of fisheries management. A study by Graham (1929) recommended that a Lake Authority be formed to ensure that fisheries regulations be set and enforced. The first legislation on fisheries was formulated in 1951 (Fish and Crocodile Act 1951). Provisions within the Act dictated the establishment of Fisheries Department and provided it with the mandate to carry out fisheries management services in Uganda.

After its formation, the Fisheries Department continued to use the fish guards of the then Game Department to monitor the lakes. The political turmoil in Uganda in the early 1970's led to the end of this role by the Game Department. A weakness in the implementation of the regulations during those years created a space for fisherfolk to use smaller sized nets that were illegal. Therefore the proportion of the immature fish in the catch rose with a direct negative effect on the regeneration of fish species. This was a clear failure of fisheries management and enforcement.

The enactment of the Fish and Crocodile Act (1951), under the laws of Uganda, was a step towards the definition of access rights on fishing. This did not, however, stop the

open access and common property problems especially on Lakes Victoria, Albert and Edward, which are shared with other countries.

The Fish and Crocodile Act of 1951 was revised in 1964 and substantially amended in 1967 as the Fish Act of 1967<sup>5</sup>. The 1967 amendment was meant to ensure that fisheries management regime would respond to the fisheries needs of the time.

Since 1967, the fisheries management system in Uganda has been based on a biological fisheries management comprising of mesh size control and protection of spawning grounds. The main purpose of Monitoring Control and Surveillance (MCS) activities currently on Uganda's waters is to enforce these rules. Although these measures do not solve the common property problem, they protect fish stocks thereby contributing to long term sustainability of fish harvesting.

Currently the Fish Act (1967) is the principal legislation for managing fisheries in Uganda. The legislative provisions within the Fish Act (1967) are the basis for the current fisheries management regime. It involves the control and limitation of effort aimed at maintaining high fish catch with a sustainable biomass growth. The main objective of the Act is set out in its title as "An Act to make provision for the control of fishing, the conservation of fish, the purchase, sale, marketing and processing of fish, and matters connected therewith."

### 2.3.2 *The current fisheries management regime*

As elsewhere, the Ugandan fisheries management regime is comprised of the three components. These components are; the Fisheries Management System (FMS), the Monitoring Control and Surveillance (MCS) and the Fisheries Judicial System (FJS).

The FMS in Uganda is currently open access for all water bodies with certain restrictions on exploitation methods in a few selected lakes. A fishing vessel licence is a requirement for all the water bodies. The access is nevertheless "open" because any Uganda citizen can get a vessel licence. Moreover, the price of a licence is very low. The fishing restrictions are on the type and size of the fishing gear (for gill nets the recommended size is 5 inches – 127 mm). The use of seine nets, cast nets, explosives and poison is prohibited on all the waters of Uganda.

The MCS system is carried out on all the water bodies both on-lake and on-land. Monitoring is carried out on all the landing sites and water bodies by fisheries staff. They record catch and other relevant information, which is later used for management and planning, purposes. The officials of the fisheries department, supported by the police and the revenue protection service, carry out the control and surveillance functions.

The Ugandan FJS is implemented using the legislative provisions within the Fish Act (1967). Under this Act, the fisheries and fisheries related offences are enforced. Upon conviction, an arrested culprit is fined, warned or remanded in prison for a period of not exceeding 2 years depending on the offence committed. If found guilty of using

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<sup>5</sup> The Fish Act (Cap. 228) as amended by Act No. 3 of 1967 under the laws of Uganda

illegal fishing gear or catching immature fish, for example, the gear and catch are confiscated and destroyed. The catch, depending on the size, can be auctioned and the proceeds paid to court.

### 3 COST RECOVERY: THEORETICAL BACKGROUND

#### 3.1 Rationale

There are several theoretical rationales for cost recovery. The most fundamental one has to do with the improvements in the extent and content of fisheries management services. Another rationale for cost recovery is its impact on fisheries efficiency when the current fisheries management system is inadequate. The third has to do with public finance and the distortive effects of general taxation.

##### *(a) Increased efficiency in management services*

Cost recovery is supposed to lead to an efficient delivery of fisheries management services. If, for instance, the industry is to pay for fisheries research, research that best suits the needs of the industry will be demanded. This will reduce the waste of resources on research that is not useful to the fisheries industry. The fisheries managers are also expected to make fisheries management decisions (based on clear scientific and economic evidence) that will improve the performance of the fishery and make the beneficiaries appreciate the services they pay for.

Andersen and Sutinen (2002) note that efficiency gains come from two sources. The first one is the improved cost-efficiency in the production of services such as research, administration and enforcement. The second source of efficiency gain is given as the production of more valuable mix of management services – a mix that better reflects the needs of the users. However, they note that not all forms of cost recovery are beneficial. Some ill-designed cost recovery measures can be detrimental and therefore reduce both the "efficiency and efficacy of fisheries management". Again, Andersen and Sutinen (2002) explained that financing fisheries management with broad-based taxes from the national treasury creates a situation where the costs are widespread and the benefits are concentrated. They argue that such a situation leads to inflated demand for such services through "decoupling of benefits and costs, and rent seeking". Recovering costs of fisheries management from the fishery therefore will not only reduce the widespread costs in a situation of concentrated profits but will also generate some degree of efficiency as those who pay for costs will demand efficient services from providers of these management services.

Kaufmann and Geen (1997) consider that cost-recovery is an incentive-driven approach for fisheries bureaucrats to adopt cost effective methodologies in provision of management services. They argue that, as monopoly providers of services, fisheries management agencies tend to decide on the type and amount of services to be provided. This, according to them, leads to such agencies undertaking activities which are technically desirable from the agency's point of view, "but which may be economically unjustifiable".

The arguments put forward by Cox (2002) on cost recovery are not principally different from those of Arnason *et al.* (2000). They agree on the general principle that

cost recovery generates incentives for more efficiency in the provision of management services.

Hardin (1985) also alludes to the concept of cost recovery in his theory that explains the distribution of costs and benefits in managing a common property resource. The theory explains how managers, amongst the groups that own the common property, distribute benefits and costs differently. The benefits are privatised, through granting sole ownership of individual enterprises that exploit the common property, while costs are commonised through financing them from public taxes. Hardin (1985) called this the "wedding of commonised costs to privatise profits" hence the P<sup>2</sup>C<sup>2</sup> game [privatise profits and commonise costs].

*(b) Increased fisheries efficiency*

The analysis of the impact on fisheries efficiency can be done under inadequate fisheries management and adequate fisheries management. The effect with inadequate fisheries management is illustrated in Figure 6.

Consider a simple bio-economic fisheries model with a sustainable harvest function TR and associated total costs TC. TC represents the cost function without fisheries management costs. The most pessimistic view is that, in the absence of cost recovery, the fishery operates at effort level E where there are no fisheries rents<sup>6</sup>. Assume management costs MC. For convenience, let us assume that these costs are independent of the actual fishing effort. Taking these costs into consideration the overall rents are negative ( $-\pi$  fig. 6).

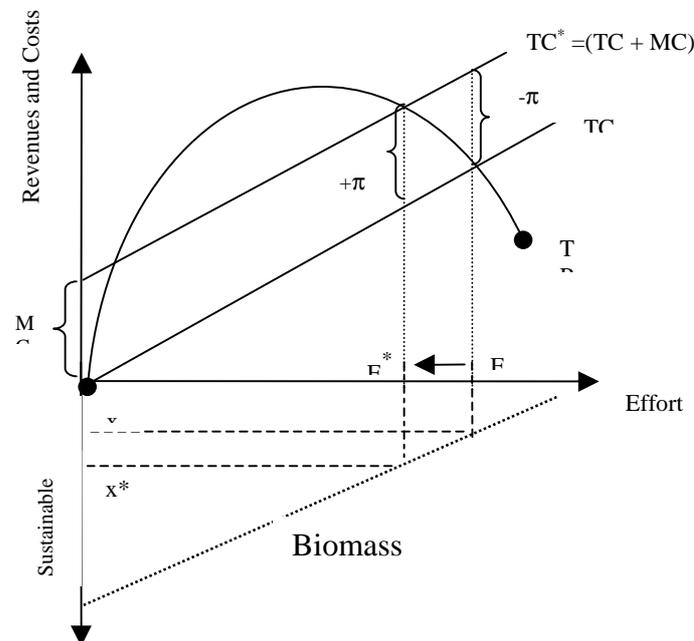


Figure 6: Pessimistic case on rents and cost recovery - The relationship between rents with and without cost recovery. Cost recovery improves the fishery at lower level effort  $E^*$  and with rents  $+\pi$ . The level of biomass improves with cost recovery.

<sup>6</sup> This implies ineffective management

With cost recovery, the costs experienced by the industry shift upward to  $TC^*$ . The new fishing equilibrium is at  $E^*$  and higher level of biomass  $X^*$  where the fishery rents are  $+\pi$  equal to fisheries management costs. Thus the cost recovery improves economic condition of the fishery by these rents. It is easy to verify, employing the same logic, that even when the fishery is generating some rents, cost recovery will still increase these rents.

The above analysis assumed a competitive non-optimally managed fishery. Figure 7 analyses the effect on the fishery with adequate or "optimal" fisheries management. Consider a similar bio-economic fisheries model with a sustainable harvest function TR and associated total costs TC. In addition, this analysis assumes a normal concave management cost function (Arnason 2002).

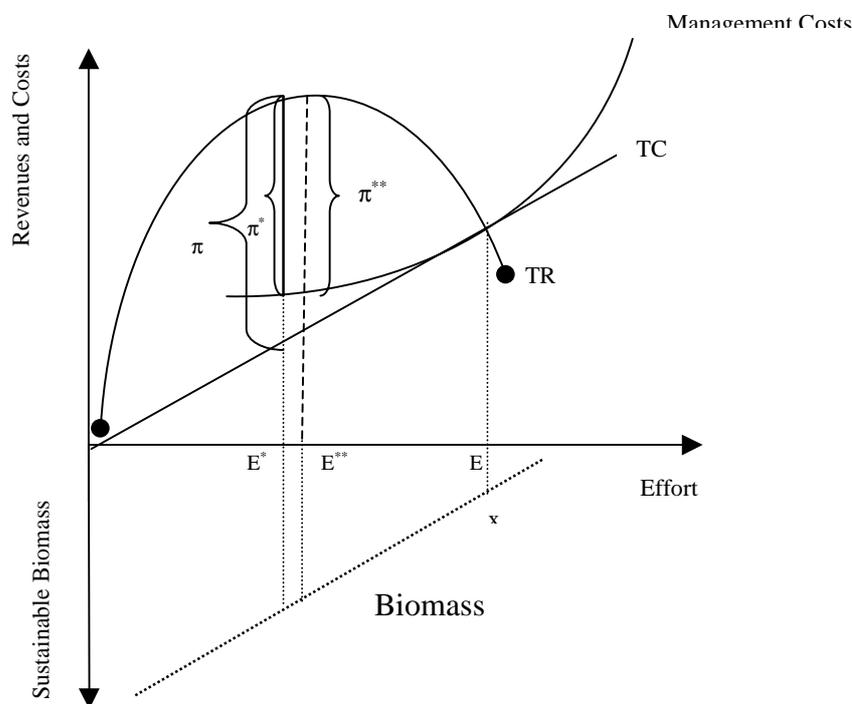


Figure 7: Optimal managed fishery and cost recovery. The relationship between rents with and without cost recovery.

The competitive fishery operates at an effort level  $E$ . The "optimal"<sup>7</sup> case with no cost recovery operates at effort level  $E^*$  and generates rents equal to  $\pi$  in Figure 7 to the fishing industry but  $\pi^*$  to society when management costs are taken into account. The optimal case with cost recovery generates rents to the fishery and society equal to  $\pi^{**}$  at effort level  $E^{**}$ . Now  $\pi^{**}$  is greater than  $\pi^*$ . Even in this case, there is an overall gain in efficiency from cost recovery.

<sup>7</sup> "Optimal in this case means the level which profits from the fishery are maximised. It is demonstrated by the largest gap between cost function and the revenue function. Note that under cost recovery and with adequate fisheries management in fig. 6, the cost curve in question is the management cost curve.

*(c) The distortive effects of public taxation.*

This argument for cost recovery is based on the premise that financing fisheries management from public revenues increases the financial burden of the tax payers and strains tax payers who may not be benefiting from the fishing industry (Arnason *et al.* 2002).

In conclusion therefore, cost recovery in fisheries improves; the efficiency in delivery of fisheries management services, the efficiency of the fishery and replaces distortive taxes with non-distortive taxes.

A brief consideration of the following quote by OECD (1998) indicates that charging the fisheries industry for financing management services is gaining use among many countries.

"Countries are increasingly financing government services through user charging. The objective of user charging is not only to achieve cost recovery from users, but also to make government services more effective and efficient" (OECD

### 3.2 Fisheries management services

According to Arnason (2002), fisheries management can broadly be classified into 3 main activities. These are:

- Research,
- The design and implementation of fisheries management rules and,
- Enforcement.

The following describes the content of each category.

**Research:** According to Arnason (2002), research generates the information necessary for the design and implementation of the appropriate fisheries management system. Research also generates information for fisheries managers to set, for example, an appropriate Total Allowable Catch (TAC), impose appropriate gear restrictions and determine the number of fishing vessel permits to be allocated. Making appropriate decisions for the management of the fishery requires both biological and economic research.

**Designing and implementation of fisheries management rules:** This activity is usually undertaken by the ministry or department responsible for fisheries. The key functions here involve designing the fisheries management system and the appropriate regulations. A fisheries management system consists of a set of fisheries control variables such as TAC and fishing gear mesh size restrictions. Imposition of fisheries management measures such as setting appropriate TAC or effort limitation, and associated administrative functions is an example of implementing some control variables.

Cox (2002) and Arnason (2002) believe that this function usually requires a smaller outlay than enforcement and research.

**Enforcement:** This function comprises the control and surveillance of the fisheries activities, the enforcement of fisheries regulations and the prosecution of those who do not comply with the fisheries management regulations. The activity includes both on-lake and on-land surveillance and monitoring. The on-lake enforcement activities may involve the use of patrol vessels or airplanes. The on-land enforcement activities involve among others the assessment of the volume of catch at landing places. The function also involves the administrative and judicial procedures, which are necessary for the processing of violations.

Most studies including Wallis and Flateen (2000), Arnason (1999), Hatcher and Pascoe (1998), Kaufmann and Geen (1997) and Cox (2002) conclude that, enforcement activities usually take a biggest proportion of the fisheries management costs.

### 3.3 Cost recovery options

There are principally three main categories of charges that can be applied to a fishery. Charges can be applied on *access to, use of inputs* and *outputs* of the fishery. Charges on fishing permits, boat (vessel) licences are examples of *access* charges. Charges on fishing gear, tenders of managing fish landing centres, fish landing tolls etc, can be categorised as charges on the *use of inputs* to the fisheries. Charges on the value of landings, such as levies or charges on the value of fish exports are the examples of *product* charges. All of these can be used as cost recovery options although a closer look at each option may reveal different economic implications on both creating efficiency in management and as a fisheries management tool. The following discusses the nature and type of each charge category.

**Access** or entry charges are charges imposed on licences of fishermen or to the fishing vessel permits in an exchange of a right to fish. They represent an attempt to solve problems of open access fishery although they do not solve the common property problem. Access charges do not take account of whether the rights are used or not. Obtaining the right to fish, in form of licence or permit, is not dependent on whether the right is going to be used or not.

Access charges may be simple to administer in fisheries where entry is on the basis of a licence or a permit (Hatcher and Pascoe 1998). The point that the charge is independent of the actual amount of total effort employed by the fishery renders it a fixed cost. Economic theory classifies access charges as *regressive* (Hartwick and Olewiler 1998). They increase a fisherman's fixed costs and have a proportionally greater financial impact on smaller scale and less efficient fishermen.

**Input** charges. These are charges, which are imposed on individual units of fishing effort. They, therefore, vary with each unit of effort used and consequently are variable costs. They include taxes on fishing inputs such as gear, fuel or days at sea, use of landing facilities and management of landing facilities. They tend to be *distortive* as they increase the cost to fishermen of certain inputs. This results in less efficient combination of inputs from a social perspective. Charges on tenders of managing the landing facilities and use of landing facilities may be easier to enforce than charges on individual unit of effort.

There are some problems associated with such charges. Taxes on fishing inputs, such as engines, for example, may be difficult to enforce as the fishermen tend shift to using different engine sizes. There are also problems with charges on the fishing gear. Their complexities in terms of gear size and its configuration may confuse the one who is setting the charge.

It is worth noting here that the common problem of any tax regime is evasion. Nobody wants to pay tax therefore people always seek ways to avoid paying it. This is analogous with non-compliance with regulations and the rest of the judicial processes, which are nonetheless costly.

**Output charges** are charges that are imposed on the outputs of the fishery such as charges on landed catch. Outputs of the fishery include fish catch/landings, and processed fish for exports. Hartwick *et al.* (1998) notes that charges on catch reduces total revenue received for each unit of effort employed in the fishery. Such charges will reduce the net profits of fishermen or fishing.

Charges such as levies on fish exports are often easy to administer especially in a sector that values the importance of well-kept and easily accessed records. They are however distortive as they tend to divert fish from exports to domestic use.

Charges on landings, on the other hand, may not be easy to administer. They can be effective if the enforcement system is strong although this will usually be expensive. In countries where co-management or self-management systems are working well, these enforcement costs are usually less.

### 3.4 Cost recovery options and fisheries management.

Before examining the effects of cost recovery options on long term behaviour of the fishery, it may be useful to clarify how these options fit in the general scheme of fisheries management systems. Arnason (2001) classifies fisheries management systems into two basic types, biological fisheries management and economic fisheries management.

Biological fisheries management involves interventions such as mesh size regulations, setting TAC, area closures, etc while economic fisheries management is divided into direct and indirect methods. Direct economic restrictions include limitation of fishing days and the number of boats or type of engines to be used.

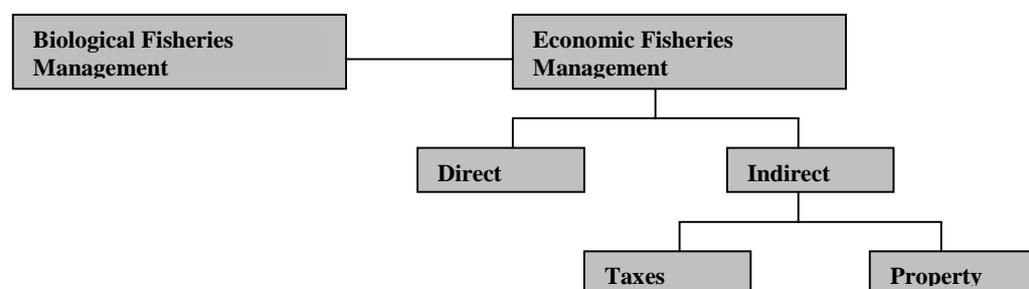


Figure 8: Classification of fisheries management systems (Arnason (2001))

Indirect economic fisheries management systems are divided into taxation and various types of property rights. Figure 8 shows a classification of fisheries management systems. Cost recovery regarded as a fisheries management technique, belongs to the class of taxes in Figure 8 as an indirect economic fisheries management method.<sup>8</sup>

### 3.4.1 Effects of output charges on catch and effort equilibrium

The classification of the effects of output charges on the fishery can be described with the help of a simple bio-economic fisheries model.

The simple bio-economic fisheries model is illustrated by a sustainable harvest function and the associated cost curve in fishing effort – value space. The basic rule under this model is that open access equilibrium is achieved where total costs of harvests (TC) are equal to total revenues from the harvests (TR). This corresponds to fishing effort  $E_0$  in Figure 9.

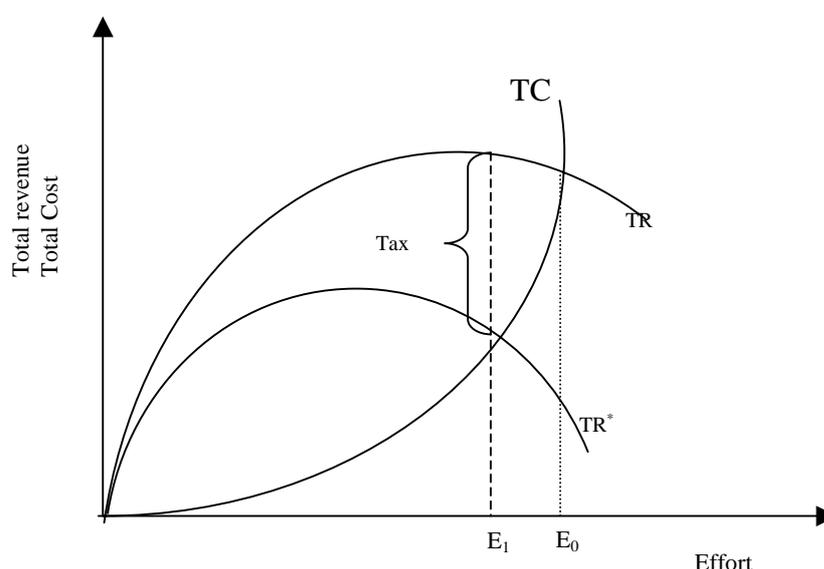


Figure 9: Effect of a charge on output revenue and effort. A tax on catch will reduce the revenue to the fishery for each unit of effort employed but will generate rents. Before the tax, firms will enter open access fishery until total revenue is equal to total costs at  $E_0$ .  $E_0$  is therefore long-term open access equilibrium before any charge is imposed on landings. The charge reduces the total amount of revenue from TR to TR\* and the long-term equilibrium is achieved at  $E_1$ . See also Hartwick and Olewiler (1998) p142.

The output charge shifts the total revenue curve down from TR to TR\*. This will move the equilibrium effort to  $E_1$ . The gap between TR and TR\* at  $E_1$  is the charge equivalent. At this point the fishery generates rents equivalent to the tax revenue.

<sup>8</sup> Note that there is some difference between taxes and charges as cost recovery options. Taxes are compulsory imposts whereas charges involve voluntary transactions (see also Musgrave and Musgrave 1980). Examples of user charges can be seen as user fees, regulatory fees, beneficiary-based taxes and liability-based taxes, levies on exports etc.

Thus the charge under this scenario generates fisheries rents that would be lost at  $E_0$  under open access.

### 3.4.2 Effects of access charges on catch and effort equilibrium

Access charges constitute a fixed cost to the fishery. This charge will shift the cost function from  $TC$  to  $TC^*$  in Figure 10 moving the effort equilibrium from  $E_0$  to  $E_1$  where  $TR$  equals  $TC^*$ . In theory, therefore, an access charge, such as fishing licence, will lead to long-term open access equilibrium at a lower level of effort. Depending on the amount of the charge and the initial position, catch revenue can be either higher or lower than the catch revenue at open access equilibrium.

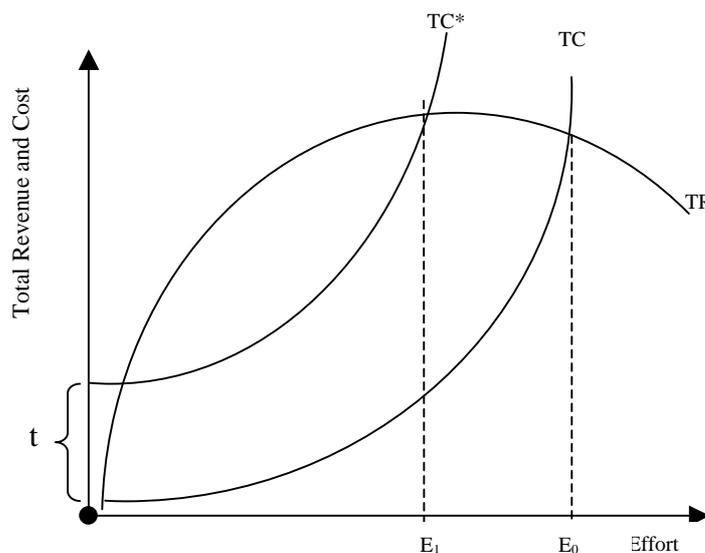


Figure 10: Effect of access charges and effort units An access charge equal to  $t$  shifts an original  $TC$  curve to  $TC^*$ . At this level of charge, the new optimal equilibrium effort shifts from  $E_0$  to  $E_1$ . See also Hartwick and Olewiler (1998) p144

### 3.4.3 Effects of input charges on catch and effort equilibrium

The effect of input charges on catch and effort equilibrium is illustrated in Figure 11. A charge on effort units such as charges on boat engines, charges on fishing gear contributes to the variable costs of effort and will therefore not shift the cost curve but will instead rotate or pivot the cost function from  $TC$  to  $TC^*$  in Figure 11. The charge has no effect if no effort is used. The charge leads to a long term open access equilibrium and lower effort level  $E_1$ . Again, depending on the amount of the charge and the initial position, catch revenue can be either higher or lower than the catch revenue at open access equilibrium.

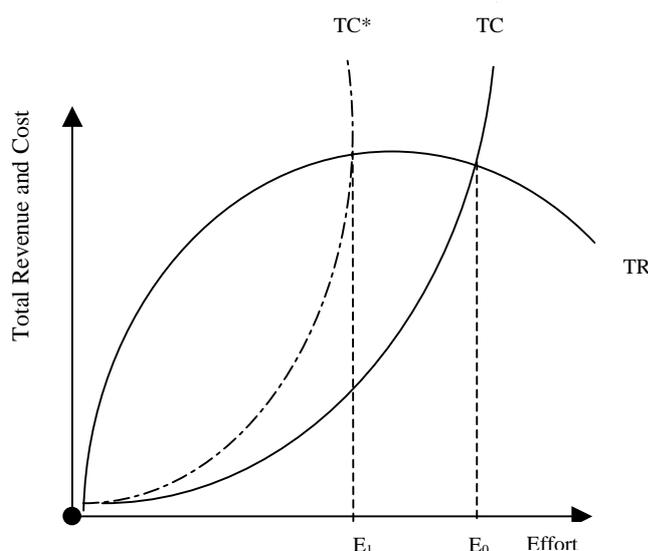


Figure 11: Effect of input charges on catch and effort units. A charge on effort units pivots the cost function from TC to TC\*. The new effort equilibrium is achieved at  $E_1$  where the  $TR = TC^*$

In principle, charges on effort units can be set so as to generate the same outcome as charges on output or access. In practice, however, there may be practical complications with effort charges since effort consists of numerous components the tax base may not be easily defined. A government may have to spend more on identifying which individual effort units to tax than what it actually gets out as tax revenue<sup>9</sup>

#### 3.4.4 Conclusions

Note that there is a close relationship between cost recovery and taxation. Taxes are compulsory imposts whereas charges involve voluntary transactions (Musgrave and Musgrave 1980). The above analysis of the effects of different types of charges has exposed us to the theoretical applications and possible practical complexities that may be associated with such charges. The effect of quotas (or quantity controls on the harvest), on the catch and effort may be of interest to note as well. This study however will not attempt to analyse these effects because quotas are not among the possible cost recovery options within the scope of this study.

In conclusion, therefore, charges can be used as rent generating management approach. Even under such a management approach, open access equilibrium is achieved at a lower effort. The lower effort level is also good for sustainable fish stock biomass. Although Anderson (1986) acknowledges that a tax is not a popular management tool, Morgenstern (1995) observed that the use of taxes and charges for generating government revenues is growing amongst many states. Anderson (1986) again argues that as a management tool, a tax on fisheries activities may lead to lowest catch at the lowest possible cost but again contends that there are management problems associated with the implementation of taxes.

<sup>9</sup> See for example Hartwick and Olewiler (1998).

"An appropriate tax will in theory keep a fishery in a long term optimum" (Hannesson 1993, p 227)

### 3.5 Cost recovery in fisheries - examples and experiences.

A general study done in OECD countries<sup>10</sup> reveals that central governments contribute substantial resources towards fisheries management. Wallis and Flaateen (2000) indicate that during 1997 alone, US\$ 507 million was spent on fisheries research in OECD countries representing 8% of all government financial transfer to fisheries. The same study found out that approximately US\$ 978 million was spent on costs associated with fisheries management (16% of all government financial transfers to fisheries). Approximately US\$ 752 million was spent on fisheries enforcement in OECD countries in 1997 (12% of all government financial transfers). Wallis and Flaateen (2000) report that, for all OECD countries, expenditures on fisheries management are about 6 % of the value of landings.

In many countries of the world, the proportion of fisheries management costs to the value of landings range from as low as 3% to more than 30%. Arnason et al. (2000b) reports that the proportion of cost of fisheries management to the value of landings varies between 15% and 25% in Newfoundland, dropped from 13% to 8% in Norway because of increase in the value of landings and only 3% in Iceland. Cox (2002) reports that from 1993 to 1999, the costs of fisheries management averaged 7.2% of the value of landings across the Commonwealth fisheries of Australia.

Australia provides one of the good examples where cost recovery in fisheries has yielded promising results in terms of raising revenue for financing fisheries management. The extent to which the recovery approaches have led to increased efficiency in Australian fisheries management may, however, be an issue of debate. Australia introduced cost recovery<sup>11</sup> approach in 1984 with the passing of two bills, which allowed collection of a levy from the fishermen to fund fisheries management services (Andersen, Sutinen and Cochran 1998). Andersen *et al.* (1998) also report that, in 1995 after the introduction of the law, levies totalling 38% of management costs were collected from fishermen in the Northern Prawn and Southern Bluefin Tuna fishery. Cox (2002) reports that up to 57% of the costs in the Commercial Commonwealth fisheries of Australia are currently recovered.

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<sup>10</sup> OECD countries include Australia, Canada, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, Spain, Sweden, United Kingdom, Iceland, Japan, Korea, Mexico, New Zealand, Norway, Poland, Turkey and United States, Czech Republic, Hungary, Luxembourg, Slovak Republic and Switzerland.

<sup>11</sup> The policy on cost recovery in Australia originated in the mid 80's based on the philosophy that the users of Commonwealth services should pay for the services in proportion to the benefits they receive. Along with this policy, there was recognition that beneficiaries of Commonwealth services, such as fishers, were entitled to have a significant input to management decisions, including those, which affect management costs. See also Cox (2002)

In Denmark, cost recovery approach has been used on a limited scale. A legal framework for using a partial cost recovery policy exists.<sup>12</sup> Legislation passed in 1998 has created a good platform for financing fisheries management through cost recovery. Andersen *et al.* (1998) report that the only form of efficiency so far created is through the interaction between the fisheries management body and the users of fisheries management services.

Andersen *et al.* (1998) reports that the United States federal and state governmental expenditures on fisheries are approximately US\$1 billion annually. Recovering costs of fisheries management is well documented within law and policy in the United States. Examples in this case include Magnuson-Stevens Fisheries Conservation and Management Act (1996) and the Wallop-Breaux Amendment (1984) (see also Annex 1 for the supporting policies and laws).

In Tanzania, cost recovery as means to finance fisheries management services is taking a very interesting shape. A 6% (called a fish export retention scheme) on the value of fish exports (f.o.b. price) is financing 100% fisheries management services. The Fisheries Division officials presented a case to their Ministry of Finance to allow the sector to recover costs of management from the fishery. This was granted on a pilot basis and the scheme has since proved practical and encouraging.<sup>13</sup>

In countries where the quota system determines fishing rights, recovering costs of management may be relatively easier. In 1998, for example, New Zealand imposed a resource rent charge on the holders of Individual Transferable Quotas (ITQs) which are allocated on quantity of fish rather than the share basis (Hatcher and Pascoe 1998).

New Zealand introduced cost recovery in 1994 following an agreement between the Ministry of Fisheries and the fishing industry to shift from collecting resource rentals to using a cost recovery approach. Wyatt (2002) reports that cost recovery has since increased the amount paid to the New Zealand government compared to what was paid through resource rental charges. Resources amounting to more than 70% of fisheries management costs and 5.5% of landed value were collected in 1996. In 1999, the Ministry of Fisheries embarked on a reform process of ensuring that the cost recovery regime improves efficiency of fisheries management services.

Canada started recovering costs of fisheries management in 1991 following the introduction of individual quota system for the halibut (Hatcher *et al.* 1998). The most interesting case here is that the amount of revenue collected in 1991 exceeded the estimated management costs by 33%.<sup>14</sup> In 1995, the Canadian Department of Fisheries and Oceans introduced a charge structure that distinguishes between different types of fisheries, where fishermen operating in non-quota fisheries pay a flat charge, and increments based on the value of their average landed (Kaufmann and Geen 1997).

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<sup>12</sup> See Andersen *et al.* (1998)

<sup>13</sup> These facts are based on individual discussion with fisheries management officials in Tanzania.

<sup>14</sup> see Hatcher *et al.* (1998)

Iceland does not have a specific legislation on cost recovery but a number of charges exist within the Icelandic fishery. The charges are contained in the Icelandic Fisheries Management Laws and Regulations (2001/2002). According to the Icelandic Fisheries Management Laws and Regulations (2001/2002) and officials from the Directorate of Fisheries, every fishing vessel obtains a fishing licence at a small fee of about US\$1,650. Vessel owners also pay charges for costs of fish inspection and surveillance. This is paid as a fixed price for each tonne of allocated quota. Small vessels that do not have quotas have special rules, which allow them to pay the fee on the basis of catch.

There is also a fee that is paid on registration of quota transfers. This fee ranges from US\$18 to US\$20 for each transfer application form depending on the type of transfer (permanent or rental). The other category of charge is a penalty that is based on quota holders who exceed their quota limits. The penalty is based on the percentage of catch value. These fees are remitted to the Marine Research Institute (MRI) for financing fisheries research. In 2000, US\$219,000 was collected from this penalty compared to US\$537,000 in 1994. Although this is a penalty that is enforced only when the quota limits are exceeded, it generates significant revenues for the MRI.

The mentioned countries so far have not reached the level of efficiency gains described by Andersen and Sutinen (2002). Since the introduction of cost recovery in 1994, New Zealand finances fisheries management based on an approved "fisheries plan". Although the plan is approved by the Minister of Fisheries, Wyatt (2002) reports that it reflects the interests of the users of the resource and the providers of the management services. This is a step forward towards the efficiency. Cox (2002) also reports that Australia formed a management advisory committee, which is comprised of members from the industry and representatives from the central management body - the Australia Fisheries Management Authority. Cox (2002) notes that the committee makes transparent decisions in determining the nature of management services and their associated budgets.

In general, the use of cost recovery is expanding in a number of countries. The options upon which this cost recovery is based vary from country to country. Either access charges, use of input charges or output charges contribute to management costs in different proportions in different countries. In countries like Australia, New Zealand and Canada, cost recovery approach is gaining a lot of public support.

#### **4 A COST RECOVERY SYSTEM FOR UGANDA FISHERIES**

In this section, various ways in which the available cost recovery options might be applied to the Ugandan fishery are examined. Considering the characteristics of fisheries management in Uganda, the analysis is based on some realistic possibilities for applying recovery options in line with the national and local data available.

In Uganda, decentralisation as a policy was effected in 1997 after the enactment of the Local Government Act (1997). Some of the fisheries management functions were decentralised to local governments at district level and lower local governments such as communities. These local government levels are critical entry points for delivery of management services in the decentralisation structure.

Currently, there are three levels at which fisheries management services in Uganda are provided within the decentralisation framework. They are; the national level, the district level and the community level. At national level, there is the current Fisheries Resources Department, essentially for fisheries administration and management, and the Fisheries Resources Research Institute for fisheries research. At the district level, there is an equivalent of the Fisheries Department that carries out district based fisheries administration and a few management functions. At the community level, communities or community groups provide community management functions that include local enforcement of rules and the administration of landing sites. Different levels of management services are illustrated in Figure 12.

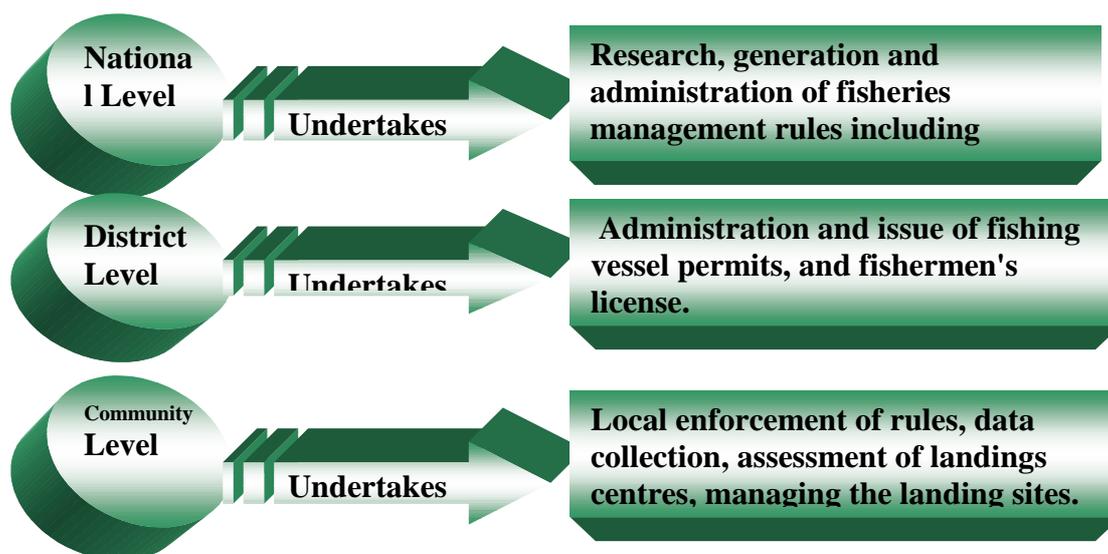


Figure 12: Levels of Fisheries Management Functions. Note that the list of functions listed at each level in the figure is not exhaustive.

This study proposes that the cost recovery mechanisms to finance fisheries management services be administered at each level in the current framework. Note also that some of the available cost recovery options suggested are already in place in some of these levels of management. It is taken for granted that the implementation of the cost recovery system on the basis of the existing framework renders it less costly.

#### **4.1 Available options for cost recovery**

Available options for cost recovery are described at three levels i.e. the national, district and community level.

##### *4.1.1 National level options*

Fish export in Uganda consists of two categories. The first category is the export of industrial fish products normally fresh or frozen fillets. The second category is the unrecorded exports of locally processed (salted, sun dried and smoked) fish to the neighbouring countries of Kenya, Rwanda and Democratic Republic of Congo. The industrial processing gets the raw material fish mainly from Lake Victoria while the

local processors get their raw material fish from almost all the fishing waters in Uganda.

In Uganda, there are currently 8 fish processing and export firms located alongside the Uganda waters of Lake Victoria. There are some indications that more processing firms will be licensed to operate on Lake Victoria and other water bodies such as Lake Kyoga. The average operational capacity of each factory is about 20 tonnes per day. Statistics on fish exports indicate a steady increase in the volume and value of fish exports (see Figure 5). The Fisheries Resources Department is authorised, by the major importers of Uganda's fish (such as the European Union) to ensure safety and quality of fish and fish products destined for the foreign markets. The department is also mandated by the Ugandan constitution (among other functions) to monitor the activities related to fish exports.

National level options for cost recovery could be based on recorded exports of industrial fish processing. The national level options include:

(a) *Industrial fish processing licence*

The industrial fish processing licence in Uganda is an annual licence issued at a charge. This is a flat charge that is imposed on fish processing firms. The licence is currently issued at an annual charge of Ugshs 500,000 (US\$294) for each operating processing factory. For the current eight existing fish processing and export factories therefore, it can be estimated that an annual total of Ugshs4 million (US\$2,400) is collected.

(b) *Health inspection certificate*

The Fisheries Resources Department is mandated to certify the quality and safety of fish, especially for export. All the fish destined for export market is certified by the Fisheries Department by issuing a health inspection certificate after conducting quality and safety tests on samples of every consignment<sup>15</sup> or batch of fish export. This certificate is issued at a charge of Ugshs 2,000 (US\$12) for every consignment.<sup>16</sup> On average each of the 8 fish processing and export factories export 7 consignments of fish and fish products every week. It can be estimated that issuing these certificates generates approximately Ugshs58 million (US\$34,000) annually.

These two options fall within the category of product charges mentioned under section 3.3. It can also be stated that the traditionally processed (salted, sun dried and smoked) fish exported to the neighbouring Congo, Kenya and Rwanda goes unrecorded and uncertified. It may be feasible for the Fisheries Resources Department to explore the option of recording these exports and in the process generate more revenue for financing fisheries management.

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<sup>15</sup> A consignment is defined under the Fish (Quality Assurance) Rules (1997) as "a quantity of fish products bound for one or more customers in the country of destination and conveyed by one means of transport only". The batch on the other hand is defined as "a quantity of fish or fish products obtained under practically identical circumstances, during a period of time indicated by specific code".

<sup>16</sup> See Statutory Instruments 1998 No. 56, section 6 (3) of the Fish (Quality Assurance) Rules 1998 Under section 43 of the Fish Act, (Cap, 228)

The two options seem to be quite feasible, as they require no new law and appear relatively easy to enforce. The industrial fish processing licence may meet some resistance from the fish processing companies as would be expected from any private profit maximising firms. The health inspection certificate may not meet as strong resistance from the processing and export firms.

Recovering costs of fisheries management from charges on industrial fish processing and exports has been suggested by the Fisheries Department before. The proposal, however, has generated opposition from private fish processors and some officials from the Ministry of Finance. The Ministry of Finance officials argued that the fish export sector is just recovering from an export ban to the European Union market and that such a charge would not be good for a recovering industry. At the same time, the Finance Ministry has of recent suspended what is called "appropriation in aid for the financial year 2001/2002 under the Non-Tax Revenue Reform Program". What this means is that departments or sectors are precluded from directly spending any money they may collect from charges. This has an implication for the Fisheries Resources Department in terms of using the option of charging management costs from fish exports. However, Blake *et al.* (2001) report that Uganda Coffee Development Authority and Uganda Tea Authority collect a charge on coffee and tea exports, which is tied to specific quality control mechanisms. The examples of Uganda Coffee Development Authority and Uganda Tea Authority should help the fisheries sector to impose charges on the fish exports. The opposition to the proposal by fish processors and exporters is however not surprising. Similar attitudes were expressed by the private industry in Australia when the Australian Fisheries Management Authority introduced a cost recovery charge for financing fisheries management (Kaufmann and Geen 1997).

#### 4.1.2 District level options

Under the decentralisation framework in Uganda, local governments are organised in three sublevels. First is the district level, which is the immediate lower local government from the central. The second one is the sub-county level, which is the immediate lower local government from the district level. The third one is the community level, which is the lowest level of local government. Under these local governments, fisheries management services are basically provided at almost all the levels but predominantly at district and community levels. The following are the district level options for cost recovery.

##### (a) Fishing vessel permits (FVPs) and fisherman's licence

In the Uganda fisheries, the right to fish requires a fishing vessel permit (FVP) and a fisherman's licence. The FVPs and the fisherman's licences are issued annually by the district fisheries departments. There are two categories of fishing vessel permits; vessels without engines are issued permits that are different from those vessels with engines.

The fishing vessel permit and the fisherman's licence are issued at a fee. The Fishing Vessel Permit costs Ugshs.12,000 (US\$7) for vessels without an engine and Ugshs.17,000 (US\$10) for vessels with an engine. The fisherman's permit is issued at a charge of Ugshs.7,500 (US\$4.4) each year.

The possibility of using the Fishing Vessel Permit as an option for cost recovery depends on both what the existing law provides and the opinion of the district fisheries managers. The Fish Act (1967) authorises the licensing officer i.e. the district fisheries officer "in his discretion, on application being made in the prescribed fee, issue to an applicant a licence in such manner and subject to such conditions as he may deem fit to impose".

The above mentioned option may not be an easier option to enforce than the national level options as the costs of enforcing it may be high. The reason for the possible high costs of enforcement is that fishermen often avoid operating in areas where local fisheries managers or organised communities can effectively monitor. Some of the non-compliant fishermen often avoid landing their catch in areas where enforcement system is effective and resort to selling their catch on-lake. The success of the option would also require serious on-lake monitoring which is costly. This option however does not require a new law and therefore, it may be a good candidate as a cost recovery option at district level.

#### *(b) Tender charges*

Charges from tendering "developed" landing sites to the private sector for management is one of the options that can be implemented to recover costs of fisheries management. The option has not been used before although it has been considered as one of the landing site management proposals by district authorities in Uganda. Offering a landing site to a private agency for management would mean that this private agency takes management responsibility for all the activities at a landing site. However, some problems may arise in the process of pushing for private interests in the management of "public and/or club goods"<sup>17</sup>.

However when the district authorities argue for tendering the landing sites for private management, it could be proposed to impose a charge on the value of these tenders for purposes of recovering costs of fisheries management. Such charges will in no doubt be passed on to the users of landing facilities and thus ultimately be borne by the fishing industry.

#### *4.1.3 Community level options*

The available community level options include:

##### *(a) Toll charges*

The option of imposing a toll charge to the users of a landing site is not widely used by Ugandan landing site managers at the moment. The fisheries sector is in the process of developing some of the fish landing sites for handling of fish and fish products. In the event where such sites are developed to higher standards, it is likely that they will attract a lot of traffic in search for improved quality fish.

It seems feasible that toll charges be imposed on high capacity vehicles entering these landing sites for the purpose of recovering costs of fisheries management activities.

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<sup>17</sup> See Andersen et al (1998) for the classification of Fisheries Management services as "club goods" and "public goods"

This represents a use charge as described in section 3.3 of this study. The landing site managers would welcome this option, as it would generate substantial revenues to finance fisheries management activities at the landing site level.

*(b) Landing charges.*

Imposing a landing charge on a fishery may be considered as an option for recovering costs of fisheries management services. Landing charges are not currently implemented in the Ugandan fishery. Landing charges, as a product charge, have a number of economic implications as discussed in section 3.2.

The Local Government Act (1997) does not provide for the imposition of landing charges. If these charges were to be imposed by the local communities, it would either require that communities formulate a bylaw legalising the option or the Local Government Act (1997) be revised to incorporate provisions enabling communities to implement this charge. The option of community bylaws seems preferable because the process is less costly and takes a relatively shorter time to enact.

If the fishermen are provided with full information on the beneficial purpose of this charge, some support amongst fishing communities may be expected. It is important to note here that in Uganda today, communities are beginning to share responsibilities with the central government in managing the fishery. With such a sharing arrangement in place, it would be quite natural to allow the fishing communities or associations to administer landing charges.

There are three main reasons why imposing landing charges may be a feasible option. *First*, it would meet with comparatively little resistance, as the communities cannot be sure of their money in terms of management services if the charges were collected and administered at national level. *Secondly*, communities share some of the management responsibilities with the central government and the recovered revenues from the landing charges would finance these community-based activities. *Thirdly*, this option does not require a revision of the existing law in support of the option as it will be managed and administered at the local level under the village or community bylaws.

## **4.2 Proposed cost recovery system in Uganda.**

The proposed cost recovery system is based on the options that are "preferred" from a set of available options discussed in section 4.1. Some options are "preferred" for simple reasons. The first reason is based on the ability of the option to be implemented with minimum resistance from the payers, who are also the intended beneficiaries of the management services. The second criterion is the minimal complexity in terms of legal processes required to legalise the option.

The cost recovery system is comprised of a set of elements. These elements are; (1) the cost recovery principles, (2) the associated cost recovery institutional structure, and (3) the cost recovery funds.

### *4.2.1 Cost recovery principles*

The cost recovery system will be based on a cost recovery at each level of government discussed in 4.1. Cost recovery at each level will finance fisheries management activities at that level.

Charges at each level of fisheries management are to cover all (or nearly all) the costs of fisheries management. In the event where a fraction of the costs are recovered, the respective committees shall decide on how to adjust charges to recover up to 100% of the costs of management. The proposed cost recovery shall be based on charges at each level as follows.

**(a) National level cost recovery charges**

The national level cost recovery shall finance national-based fisheries management activities and functions. The national cost recovery shall be by means of charges on issuing industrial fish processing licences. A cost recovery charge will be set based on percentage of the value of fish exports (f.o.b. price).

*Issue of industrial fish processing licence (IFPL)*

Currently, the fisheries department is authorised by law to issue the industrial fish processing licence to any operating fish processing company. The current annual flat fee of Ugshs 500,000 (US\$294) is however fixed, i.e. does not depend on either the value of fish exports or the capacity of the processing company. It is proposed that the new industrial fish processing licence charge be imposed as a basic fixed plus an increasing function of the value of exports. More formally, the proposed charge is:

$$C_t = \alpha + \beta V_t \quad (1)$$

Where,  $C_t$  represents the charge in period t  
 $\alpha$  represents the fixed charge.  
 $\beta$  represents the proportion of the value of fish exports payable  
 $V_t$  represents the value of fish export for a particular period t

The value of  $\alpha$  can be paid annually while  $\beta V_t$  can be paid monthly to allow fish processing companies to pay as they generate income. This reduces the risk of being subjected to paying a charge at the end of year for firms that may not have been making profits. It also reduces the difficulty of financing big charges at a single time. One advantage of this proposal is that the percentage charge on the value of exports ( $\beta$ ) reduces the regressiveness of the charge. Small firms pay less and big firms pay more.

Under formula (1), it is easy to adjust the charges to the actual cost of fisheries management by the simple expedient of adjusting the parameters  $\alpha$  and  $\beta$ .

**(b) District level cost recovery**

District level cost recovery shall finance district based fisheries management activities and functions. The cost recovery shall be by means of charges on fishing vessel permits and fisherman's licences.

*Fishing vessel permits and fishermen's licences*

As already discussed, the districts are mandated to issue fishing vessel permits and fishermen's licence based on guidance from the Fisheries Resources Department. It is proposed that the districts continue to issue fishing vessel permits and the fishermen's licences. The number of permits and licences to be issued shall continue to be determined and communicated to local governments by the Fisheries Resources Department.

It is proposed that issuing of fishing vessel permit and the fishermen's licence continue to be issued at charge. The change however is that the money from these permits and licences shall form part of the district cost recovery fund established and not to the district treasury as has been the case. The charge shall also be adjusted to the management cost as determined by the district cost recovery committee. Formally, the proposed charge is;

$$CR_t = A_t P_t + L_{tj} P_{tj} + L_{ti} P_{ti} \quad (2)$$

Where  $CR_t$  represents the charge in period t  
 $A_t$  represents the number of fishermen (applicant) for fishing licence  
 $P_t$  represents the cost of each fisherman's licence  
 $L_{tj}$  represents the number of fishing vessel with engines  
 $P_{tj}$  represents the cost of each permit for a vessel with engine  
 $L_{ti}$  represents the number of fishing vessels without engines  
 $P_{ti}$  represents the cost of each permit for vessel without engine.

In the event where less than full management costs in a district are recovered, the district cost recovery committee shall either reduce management services, adjust the charges or adopt other options identified in this study to recover up to 100% of management costs.

#### 4.2.2 (c) Community level cost recovery

As mentioned, communities provide community fisheries management functions (often referred to as self-management) that require financing. The following cost recovery options are suggested at the community level.

Community level cost recovery shall finance community based fisheries management activities and functions. The cost recovery shall be by means of charges on fish landings.

##### *Landing Charges.*

Managers of local communities shall institute a percentage charge on the value of landings. A community-based cost recovery committee shall determine the amount of the charge based on the value of catch. The charge shall be paid either as a percentage of the value of their sales or in terms of allocating a certain quantity of fish to the cost recovery fund. In the case where the fishermen or fishing firms allocate quantity of fish instead of value of the landings, the fish shall be sold to recover the costs of management services at the community level. Formally, the proposed charge is:

$$CR_t = \phi Y_t P_t \quad (3)$$

Where  $CR_t$  represents the landing charge in a period t

$\phi$	represents the proportion of the value of landed catch payable
$Y_t$	represents the landed catch in period $t$ at a landing site.
$P_t$	represents unit price of catch in kilograms

The landing charge is the proposed option for recovering fisheries management costs at community level. Community leaders shall initiate a process of enacting bylaws to legalise this option. By simply adjusting the parameter  $\phi$ , the system will be made to recover nearly all or all management costs at community level.

#### 4.2.3 *The cost recovery institutions*

The key cost recovery institutional structures will be cost recovery committees (CRC). These shall be formed at each of the fisheries management levels mentioned in section 4. Each committee will have at least one member from the payers (who are also the intended beneficiaries) and providers of fisheries management services. The committees will be responsible for making decisions regarding cost recovery charges and the cost recovery management services to be provided. The committee members and their functions at each level will be as follows.

##### (i) **National level structure**

###### *(a) The National Cost Recovery Committee*

The committee shall be based at and empowered by the Fisheries Resources Department. This is because of the departments' role of monitoring fish exports discussed in section 4.1.1. This role also makes the department ideally placed to take a lead role in imposing the charge and ensuring compliance from fish processing companies. The national level cost recovery committee shall be comprised of the following members.

1.	The Commissioner for Fisheries	–	Chair
2.	The Fisheries Resources Research Institute	-	Member
3.	Lake Victoria Fisheries Organisation	-	Member
4.	Fisheries Exporters and Processors Association	-	Member
5.	Technical Official for Cost Recovery	-	Secretary

It is assumed that the committee will make balanced decisions that take care of the interests of beneficiaries of management services, who are also the payers for the management services.

###### *(b) National level cost recovery functions*

The principal functions of the national level cost recovery committee will be to:

1. Decide on the nature and type of fisheries management services
2. Decide on the level of charges to be instituted and
3. Manage the cost recovery funds.

In addition, the committee shall ensure that the key players are involved in setting the charges and ensure delivery of management services. The committee shall evaluate the activities and determine the charge to be set.

The national committee shall manage the cost recovery fund at national level. It will approve work plans and make decisions over allocation of resources. It is envisaged that allocation of funds will be based on specific sector work plans and budgets. Money will be allocated on quarterly basis upon presentation of quarterly work plans and budgets. The subsequent allocations will be made upon receipt of full accounts for previous quarter allocations. A quarterly report will be mandatory accompaniment to the financial resource accountability.

#### 4.2.4 *District level structure*

##### *(a) The district cost recovery committee*

The district cost recovery will be based at the district fisheries department.

The district committee shall be constituted of the following members:

1. The Chief Administrative Officer – Chairman
2. The Chairman of the District Production Committee – Member
3. The Secretary for Production – Member
4. The District Fisheries Officer – Secretary

##### *(b) District level cost recovery functions*

The principal functions of the district level cost recovery committee will be to:

1. Decide on the nature and type of fisheries management services
2. Decide on the level of charges to be instituted
3. Manage the cost recovery funds.

In addition, it will make decisions on how financial resources will be allocated. Allocation of cost recovery financial resources will also be based on specific work plans and budgets. Money will be allocated on a quarterly basis upon presentation of quarterly work plans and budgets. The subsequent allocations will be made upon receipt of full accounts for the previous quarter allocations. A quarterly report will be mandatory accompaniment to the financial resource accountability.

#### 4.2.5 *Community level structure*

##### *(a) Community cost recovery committee*

The landing site/community cost recovery committee shall be based at the landing sites or the associated villages. The current community management groups at landing sites shall arrange for communities to elect members of the community management committee. The committee will be constituted by a representation of the fishermen (who are the beneficiaries of management services as well as payers of the charge) and the managers of these fishing communities.

##### *(b) Community level cost recovery functions*

The principal functions of the community level cost recovery committee will be to:

1. Decide on the nature and type of fisheries management services
2. Decide on the level of charges to be instituted
3. Manage the cost recovery funds.

The committee shall decide on the activities and work plans to be undertaken. The committee shall make decisions on the allocation and utilisation of the cost recovery fund. The national and district committees shall provide technical guidance in the financial management of these funds. The committee members shall moreover undergo skill development training in the management of the cost recovery fund.

It is important to realise that community management and the cost recovery committee may not solve the common property problems. After all there are many communities that compete for scarce fish resources. Therefore, the committee may deem it in their interest to over apply and use the illegal methods thereby exacerbating the common property problem. For this reason it is still necessary for central government and/or with district officials to provide collective management to communities, say, by imposing collective penalties on communities in case of failure to adhere to the rules and standards on community management. Such penalties may be in form of a threat to remove the powers of management from them.

#### *4.2.6 The cost recovery funds*

The cost recovery at each government level (national, district and community) will generate funds. These funds shall be collected and administered at the respective levels.

The national cost recovery committees shall open a bank account. The Commissioner for Fisheries will be the principal signatory to the national cost recovery fund account. The utilisation of the funds will follow the government of Uganda financial management and accountability guidelines.

The district committee will have a district based cost recovery fund accounts also opened in one of the banks. The District Fisheries Officer will be one of the signatories of the district accounts and the Chief Administrative Officer shall be the principal signatory. A fisheries cost recovery fund financial management manual will be a key document to guide the operation of the cost recovery fund.

The beach/community committees shall also have a cost recovery fund accounts opened in one of the banks. There will be clear guidelines within the cost recovery fund financial management manual on how to administer these funds. The committee chairman at each beach/community will be a principal signatory to this account. The board will elect other signatory members.

#### 4.2.7 The cost recovery system: An overview.

The overview of the cost recovery system will be as illustrated in Figure 13 where the different level cost recovery will utilise cost recovery funds to undertake respective level management services.

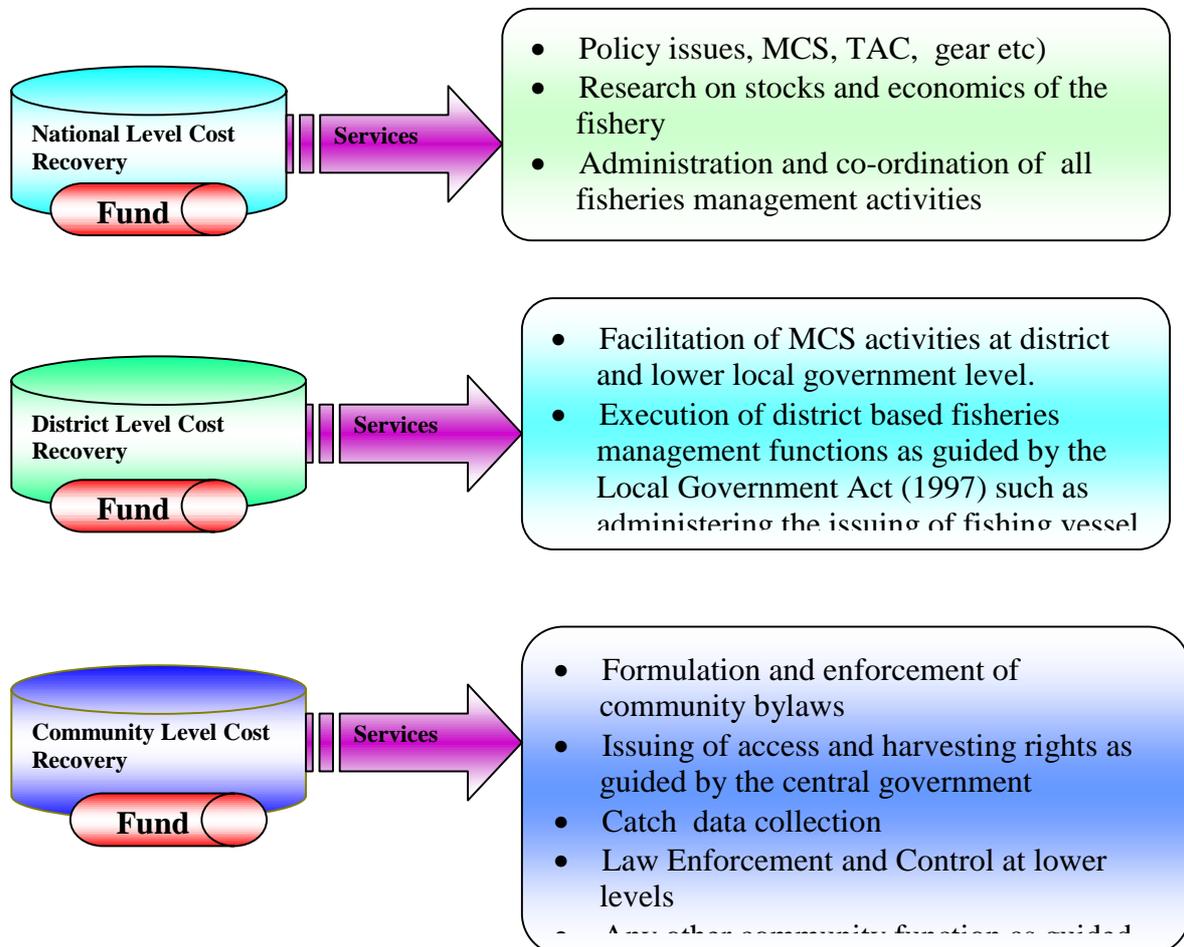


Figure 13: Cost Recovery Management System describing cost recovery at each level and the nature of services at that level.

### 4.3 Cost Recovery: Costs and potential recovered revenues

The Fisheries Resources Department has for years made plans for designing and implementing fisheries management rules and enforcement while Fisheries Resources Research Institute had for years made plans for undertaking fisheries research. Note that research, as a management function is institutionally located outside the mainstream structure of the Ministry of Agriculture, Animal Industry and Fisheries where the Fisheries Resources Department is located. Fisheries management plans developed by both the Fisheries Resources Department and the Fisheries Resources Research Institute are well thought out and they constitute a basis for the actual and reasonable fisheries management costs. These costs are about US\$4.6 million as can be seen from Table 2. Note that these costs are not disaggregated to reflect costs at each fisheries management level.

**Table 2: Fisheries Management Functions and their estimated Costs \***

Institution	Budget in Ughs	Budget in US \$
Support to Lake Victoria Fisheries Organisation (LVFO)	744,600,000	438,000
Fisheries Resources Research Institute	1,974,914,000	1,161,714
Monitoring Control and Surveillance (MCS)	2,973,078,556	1,748,870
Designing and Implementation of Rules	2,117,844,802	1,245,791
Total	7,810,437,358	4,594,375

\* Note that these costs estimates are indicative only. They may vary depending on the services in a given year.

The cost recovery system is designed to be able to recover all the costs of fisheries management. Whether that is economically justifiable is another matter, however, see section 5.1. Moreover, it is desirable to recover the actual management costs at each level of fisheries management.

#### 4.3.1 Potential recovered revenues

Estimation of potential recovered revenue for the cost recovery system is based on the cost recovery charges mentioned under section 4.2.1.

##### (a) Estimating recovered revenue at national level.

Potential recovered revenue at national level is made under a set of assumptions.

- The value of fish exports is taken for year 2000 which was US\$30.2 million (MAAIF 2001)
- Assume a fixed charge of US\$294 per year per firm,
- Assume the proportion of the value of export payable to be 6%

Substituting these values into equation (1), the estimate becomes US\$1.8 million<sup>18</sup>

##### (b) Estimating cost recovery at district level.

Estimating cost recovery at district level is based on a set of assumptions. The district level options were identified as charges on the fishing vessel permits and fisherman's licence. The official statistics from the frame survey of the fisheries department (MAAIF 2001) report that there are about 35,000 fishermen on Lake Victoria. It is also reported that Lake Victoria contributes 60% of the total number of fishermen on all the fishing waters of Uganda. It is therefore estimated that there is a total of 58,165 fishermen on the Ugandan fishing waters. The pessimistic assumption is that not all the fishermen obtain fisherman's licence every year. It is assumed that 70% of these fishermen get the licence annually, and the licence fee is US\$4.4 a year.

For the fishing vessels with engines, it is estimated that 2,031 permits are issued for vessels with engines on Lake Victoria annually. It is also assumed that this is 60% of

<sup>18</sup>  $C_t = \alpha + \beta V_t \approx 1.8 \text{ million} [(US\$294)*8 + (0.06)(30.2)]$   
 $V_t = US\$30.2 \text{ million}$   
 $\alpha = US\$294$   
 $\beta = 6\%$

all the vessels with engines in Uganda. The total number of vessels with engines therefore is 3,385. Licences are issued at US\$10 each annually.

Data available from (MAAIF 2001) indicate that a total of 15,544 fishing permits are issued annually for fishing vessels without engines on Lake Victoria. It is also assumed that this represent 60% of the total permits issued to all the fishing vessels in Uganda. The assumption gives the estimated total number of vessels without engines to be 25,907 on all the fishing waters in Uganda. The permit for vessels without engines is US\$7.1. Taking all the above assumptions in consideration and substituting these values into equation (2), the estimate becomes US\$397,000.<sup>19</sup>

### *(c) Estimating cost recovery at community level*

The community level estimates are based on the value of landings. It is estimated that artisanal fish production in Uganda reached 229,400 metric tonnes in 2000. The average price of fish at a landing site is US\$0.5 each kilogram. Assuming a uniform 1% charge on the value of catch at all landing sites and substituting these values into equation (3), the estimate becomes US\$ 1.2 million.<sup>20</sup> The total recovered revenues from all the three levels are shown in Table 3.

Table 3: Total Recovered Costs

Level	US\$ million
National Level	1.8
District level	0.4
Community level	1.3
<b>Total</b>	<b>3.4</b>

According to Table 3, total recovered revenues at all levels are estimated at US\$3.4 million. These estimates constitute 74% of costs of management, which have been estimated at US\$4.6 million in Table 2. Assuming other factors being equal, it is evident that this recovery system would not recover 100% management costs.

## **4.4 The cost recovery system: Implications for the fishery**

The proposed cost recovery system has a number of implications for the fishery. According to the analysis in section 3.1, the implications concern primarily (a) efficiency in the provision of fisheries management services and (b) the performance of the fishery. In addition, one may wonder about the financial impact of cost recovery on the fishing industry

### *(a) Efficiency in provision of fisheries management services.*

$$^{19} CR_t = A_t P_t + L_{ij} P_{ij} + L_i P_i$$

$$A_t = 58,165, P_t = \text{US\$}4.4, L_t = 3,385, P_{ij} = \text{US\$}10, L_{ij} = 25,907, P_{ii} = \text{US\$}7.1$$

$$^{20} CR_t = \phi Y_t P \quad CR_t = [(0.01) * (229,400) * (1,000) * (0.5)] \approx \text{US\$}1.2 \text{ million}$$

$$\phi = 1\%$$

$$Y_t = 229,400 \text{ metric tonnes}$$

$$P_t = \text{US\$}0.5 \text{ @ kilogram}$$

The theoretical examination in section 3.4 demonstrates that there is little concrete information linking cost recovery to efficiency in fisheries management. The theory available seems to be convincing but the empirical data is weak. This is partly because of the little experience of cost recovery and also the difficulty of verifying theory with empirical data.

There are reasons however, to believe that the proposed cost recovery system may improve efficiency of management services in Uganda. As Andersen *et al.* (2002) notes that user charges are capable of balancing what people pay with the benefits they receive.<sup>21</sup> Some examples of efficiency gains in Australia by Kaufmann and Geen (1997) and Wyatt (2002) in New Zealand provide some hope that the proposed cost recovery system will improve efficiency in fisheries management. Moreover, fisheries management in Uganda is not fundamentally different from fisheries management in other countries like Australia and New Zealand where there are some indications of improvements in the delivery of management services.

It is also possible that the cost recovery system may influence the thinking of Ugandan fisheries managers to shift from designing management services that are not cost effective to cost effective services that reflect the actual needs of the users. Recall also that cost recovery does not have a long history where it is practised. It may, therefore, be too early to infer, from practice, that cost recovery will guarantee full efficiency in management services.

What is known from both public finance theories and in practice is that, there is no relationship between the amount of taxes or charges paid and the amount of benefits or services received by the public. Although cost recovery assumes that there is a close relationship, there is no guarantee, at least in many government services, that the cost recovery system can ensure full efficiency in fisheries management.

#### *(b) Fisheries efficiency*

The extent to which cost recovery system will improve the efficiency of the fishery in Uganda may not be easy to tell. However, if the payers also decide on the services, then the probability increases. What is clear is that at under an effective management the fishery will generate some rents. This is good for the fishery itself and to society as whole. It may also be possible, depending on the type of the fisheries management system that the fishery may move to the optimal level.

However, from theory and experience of individual fishermen in Uganda, the cost recovery system will affect some fishermen, especially the less efficient ones. The charges on catch under the community level options, for example, looks very appealing in theory. In real practice however, fishermen and fishing firms still act as if they had open access to the fishery. Ensuring that the option of imposing charge on catch succeeds, it may require spending a lot on monitoring and enforcing the collection activity thereby increasing the costs of collecting the charge.

The charges on value of exports on the other hand are distortive. Some officials in the Ugandan economy interpreted this charge to be a disincentive to export industry. Such

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<sup>21</sup> Andersen et al (2002) believes that when the correlation between benefits and charges is close, user charges become prices.

an interpretation may be used to rally against the charges on the industrial fish processing which in turn will affect the cost recovery revenues and management services in particular. Bearing such in mind, the success of the cost recovery system, as Pascoe *et al.* (2000) notes, will depend on how the decision-makers are convinced that cost recovery is good for both the efficiency of fisheries management services as well as overall improvement of the fishery.

## 5 OTHER ISSUES

In this section two further issues associated with the proposed cost recovery system are discussed. They are: (i) the ability of the system to recover sufficient funds to finance the costs of fisheries management services; and (ii) the incidence of the charges proposed in the system to the fishery – who actually pays the charge?

### 5.1 The ability of the system to recover costs

The proposed cost recovery system discussed above assumes that costs are fully recoverable. This is by no means automatically true. For this to be possible, potential economic rents from the fishery must at least equal the management costs. So, what are the potential rents?

Empirical studies (see e.g. Arnason 1990, Bjorndal 1990<sup>22</sup> and others) suggest that potential economic rents in fisheries typically range from 10-60% of the gross value of landings. In Uganda, the gross value of landings may be estimated in the neighbourhood of at least US\$ 2-300 million. Hence, the potential rents should be at least US\$20 million and quite possibly as high as or higher than US\$100 million annually.

In comparison, the annual expected costs of fisheries management have been estimated about US\$4.6 million (see Table 2). Thus, it seems abundantly clear that it is technically possible to recover from the industry the full costs of fisheries management services.

It is another question whether it is economically wise to aim for full rather than a partial cost recovery. Some fisheries management services are enjoyed not only by the fishing industry but also by other parts of the public. Thus, for instance, basic biological research is of interest and even used by many others than just fishermen. Even more importantly, some fisheries management services belong to the category of "public goods"<sup>23</sup>. Research for example is considered "a public good" since anybody can use research outputs without limiting its use to another user. It is well known that public goods will be underprovided unless their production is subsidised. The

<sup>22</sup> Arnason, R. 1990. A numerical model of the Icelandic Demersal Fisheries. In G. Rodrigues(ed.) Operations Research and Management in Fishing . Nato ASI vol. 189. Kluwer. Bjorndal. T. 1990. A Bioeconomic Analysis of North sea Herring. In G. Rodrigues(ed.) Operations Research and Management in Fishing . Nato ASI vol. 189. Kluwer.

<sup>23</sup> See Andersen *et al.* (2002), Arnason (2002) for a detailed description of club goods and public goods.

question therefore is, Given this, should the fishery pay for all fisheries management services? Answers to such a question may vary but the most important one is that if there are some services of "public" nature, the fishery should not pay for them and this probably leads to reduced supply of fisheries management services and the associated costs.

It is important to realise that although full cost recovery may be technically achievable, it may not be politically feasible. Inevitably, the fishing industry will resist the imposition of charges, especially for services that hitherto have been provided free of charge. Other things being equal, this opposition will in general be most vociferous from the segments of the fishing industry that are disproportionately hit by charges and furthest removed from the actual harvesting activity. In our case, it is probably the industrial export industry.<sup>24</sup> It is only to be expected that these interests and others will try and mobilise political forces in their support. Countering these sentiments is the fact that proper fisheries management is to the benefit of the fishing industry as a whole. Therefore, no segment of the industry will benefit from strangling these services through lack of funds.

These considerations suggest two things: First, it may be unwise to aim for full cost recovery, at least at the outset. It is for this reason that the cost recovery proposal discussed in section 4 is designed to generate only about US\$3.4 million annually compared to estimated management costs of US\$4.6 million. Second, it may be wise to introduce the cost recovery in phases, gradually increasing the charges over a number of years. This would ease the initial financial burden of the system and, consequently, also the opposition and thus help generating general acceptance and consensus building amongst the parties involved. It is assumed that the hopefully positive experience gained during the transition period will help to ultimately generate a willingness to recover management costs to the optimal extent.

This transition process would require that the fisheries authorities continue annual budgetary allocations to fisheries management and to attract donor funding for the same purpose. During the adjustment period the central government and donor funding should be regarded as a temporary assistance and supplements and not as a recurring financing obligation.

## **5.2 The incidence of the cost recovery system on the fishery: Who actually pays?**

The proposed cost recovery system will disproportionately affect the various sector of the industry. Irrespective of the point of imposition however, indications are that most of these charges will ultimately be borne by the fishermen.

### *Charges on catch*

The imposition of charges on landings may result in a long-term reduction of the number of fishermen from the fishery as a result of increased costs. In the long run, the higher costs resulting from the charges will be offset by the increased average catches arising from, presumably, higher levels of fish stocks. In the short term

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<sup>24</sup> Recall that according to the proposed system, this sector will be asked to contribute 6% of the gross value of exports.,

however, the charges will probably not drive away many fishermen. In the short run therefore, any increase in the costs, arising from management cost recovery landing charges, will result in a decrease in profitability of the fisherman currently in the fishery.

One other question that may be posed is how likely are the fishermen to be able to pass on the landing charge to the consumer? In a response to a charge on catch, fishermen will be tempted to increase fish prices in a bid to cover the increased costs. Economic theory explains consumers' responses to products whose unit prices have changed. The economic terminology for such responses of demand and supply to changes in prices is *price elasticity of demand and supply* respectively. In most cases of Ugandan fisheries, the fishermen are price takers rather than price makers and experience shows that there are no major price differences across many landing sites.

The analysis of the social impact and incidence of cost recovery charges is illustrated in figures 14, 15 and 16. Figure 14 assumes a competitive fishery. The long run supply curve for fish is backward bending (see Arnason 2000a).  $S_0$  is the supply curve without cost recovery and  $S_1$  is the supply curve with cost recovery (i.e. in response to cost recovery charges).  $D$  is the demand curve. The equilibrium price in a competitive fishery is at  $p_0$  where the fish supply is at  $y_0$ . With cost recovery, charges shift the supply curve to  $S_1$ . The cost recovery equilibrium price is achieved at a lower level  $p_1$  and supply is at  $y_1$ . The consumers therefore benefit from the charge. The fishermen on the other hand are not hurt because their equilibrium profits in the initial and final case are equal namely zero.

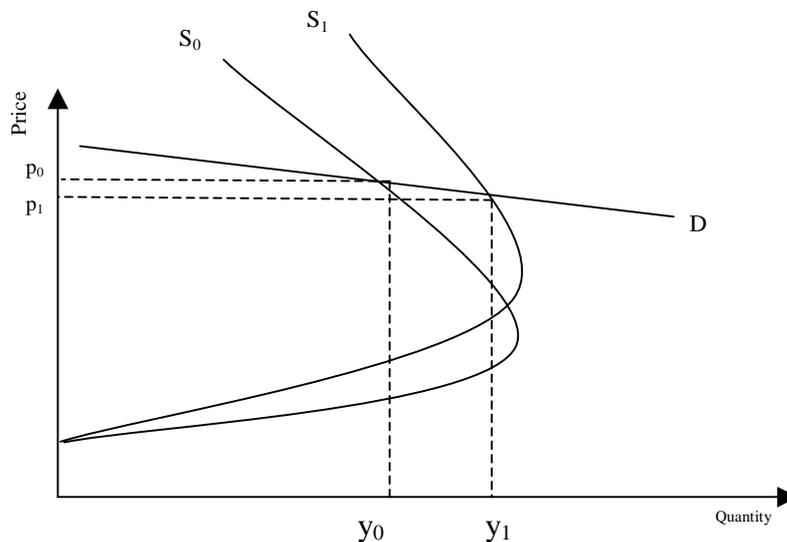


Figure 14: The competitive case of cost recovery and the supply demand for fish

Figure 15 on the other hand illustrates the effect of the cost recovery charges to supply and demand for fish in an optimally managed fishery. The long run supply curve under the optimally managed fishery is as shown in Figure 15. The equilibrium price before cost recovery charges is  $p_0$  and supply is  $y_0$ . The cost recovery charges shifts the supply curve to the left and the equilibrium is achieved at a higher price  $p_1$  and lower level of supply and demand  $y_1$ . So in this case consumers are hurt by the imposition of the charge. This means that they share the burden with the fishermen.

Alternatively one could say that they enjoyed part of the subsidised fisheries management services.

Note that the outcome depends heavily on slope of the demand curve. If it is perfectly elastic, there would be no changes in price. Some case experiences in Uganda fisheries indicate that the demand curve for fish is fairly elastic for a variety of fish species. What this means is that a unit change in price offsets a more than proportionate change in the amount of fish quantity demanded. The implication of this is that if fishermen decide to increase the price of fish,<sup>25</sup> in reaction to a charge on the value of landings, the reduction in demand for the fish will lead to more than the proportionate increase in price<sup>26</sup> e.g. figure 14 and 15.

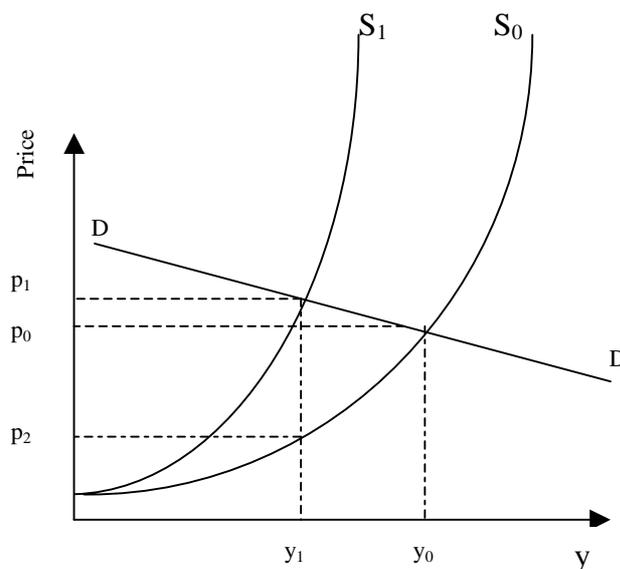


Figure 15: Supply – Demand for fish and the incidence of cost recovery charges

Consumer economics tells us that the price elasticity of demand for a particular product depends on consumer preferences, i.e., the willingness of consumers to give up the consumption of a particular product for another. In the event of a fish price increase, consumers are likely to switch to substitutes. This will make fishermen (suppliers) reluctant to increase the prices of fish as the proportionate decrease in demand will be greater than the increase in price. Fishermen stand to lose more by an increase in the price of fish than by assuming the burden of the charges on catch. High elasticity of demand is, therefore, likely to make the fisherman bear the highest burden of the landing charge, with a relatively smaller part of the charge being transferred to the buyers.

#### *Access charges*

<sup>25</sup> Although the prices of fish on individual landing sites may fluctuate, the prices of fish are generally more stable across the landings on individual lakes. The final prices paid by consumers may differ from the landing prices (the difference being the profits and margins of the fish businessmen) but are relatively stable and similar across many fish markets.

<sup>26</sup> The changes in price and reduction in demand can illustrate this.  $p_0 p_1$  is less than the proportionate change  $y_0 y_1$ . ( $p_0 p_1 < y_0 y_1$ )

The effect of access charges is to shift the long run supply curves upwards as in the case of charges on catch. This will hold in both the competitive and the optimal fishery. Therefore, the effect of access charges will be essentially the same as charges on catch.

#### *Charges on the value of fish exports*

With the imposition of charges on the value of fish exports, fish processors and exporters are faced with two options in terms of shifting the burden of this charge. The first option is to shift the burden of the charges to importers of fish by increasing the price of processed fish fillets and other fish products. The second option is to shift the burden to fish suppliers at fish landing sites. The first option is hardly feasible. Ugandan fish processors and exporters are very small compared to their corresponding suppliers of fish at the international market. They are therefore at a disadvantage in terms of bargaining for higher fish prices at these markets. They are price takers and not price makers. Their decision to increase the price of fish exported is likely to result into the importing companies switch to other relatively cheaper fish species from other suppliers. The most likely decision to be taken by fish processors and exporters in response to export charges is therefore to offer cheaper prices for the same amount of fish to their suppliers – the fishermen. In Figure 16, the charges shift the demand curve  $DD$  to  $D'D'$ . After cost recovery, and in a competitive fishery, the fish price reduces from  $p_0$  to  $p_1$  and supply increases from  $y_0$  to  $y_1$ . In such a case, consumers benefit. The fishermen's profits are initially and later zero.

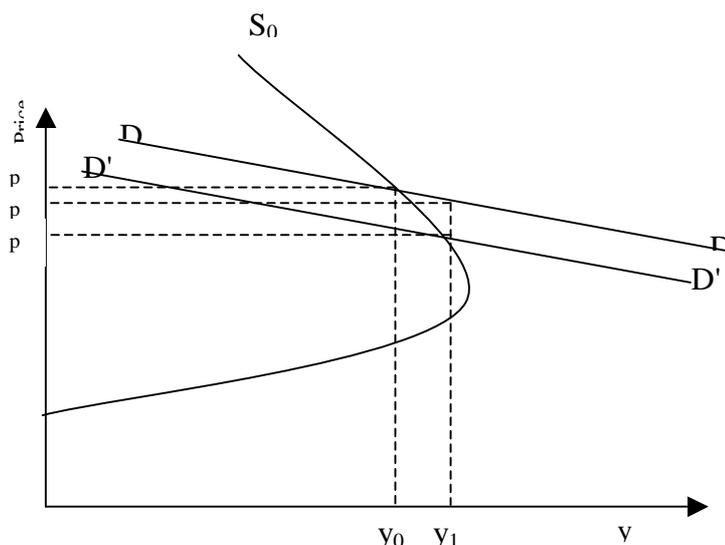


Figure 16: The competitive case of cost recovery and the supply- demand for fish

## 6 CONCLUSIONS

The rationale for cost recovery is to increase efficiency in fisheries management services, increase fisheries efficiency and avoiding the distortive effects of public taxation. In this sense, cost recovery can be seen as practical option for financing fisheries management in Uganda. The cost recovery system for the Ugandan fishery has been proposed and its possible implications to the fishing industry have been explored.

This study proposes a cost recovery system with a number of charges on the fishing industry. Some are new while others are not new to the Ugandan fishing industry. It is possible that the proposed new charges on fishermen and or private industry will be unpopular. While the Ugandan policy makers may take the view that some or all of the costs of fisheries management should be borne by the fisheries industry, the industry itself may come up with different views. After all, any charge will, to some extent, have adverse financial consequences for all the payers, at least, in the short run.

It is hoped the implementation of the cost recovery system will result into a more effective and improved fisheries management regime. In other words, an effective and more relevant research will be undertaken, there will be a more efficient allocation of enforcement, and a more appropriate management of fisheries rules and regulations

What is clear from this study is that the fisheries resource in Uganda generates economic rents and if recoverable, they can finance fisheries management costs. This study makes it clear that it is technically possible to recover from the industry the full costs of fisheries management.

What is also certain is that this concept of cost recovery will raise some questions within the fisheries industry and amongst some politicians. The questions will likely be on the system in delivering management services in general and the extent to which the industry will have a say in the way the fisheries is managed in particular. If the payers of the fisheries management services (especially the private industry and fishermen) understand the concept of cost recovery, questions of such nature will be limited, since they are obliged to demand services they pay for.

The experiences in Australia, New Zealand and some other countries tell us that if the fisheries industry pay for its costs of management, the industry is encouraged to demand a greater say in the level of management. Even the fishermen, and private firms operating in the fishery, may demand greater transparency in costs at individual fishery level.

In some ways, the introduction of the cost recovery system might be a positive development for Uganda's fishing industry. If the industry's demands for transparency in management services were met, it would be a significant shift in the attitude of fishermen and firms to the management regime in general and to their relationship with the Fisheries Resources Department in particular.

## ACKNOWLEDGEMENTS

Dr. Jon G. Sutinen, a professor of economics at the University of Rhode Island, USA once said that economists are like students of decision-making who believe that incentives matter as people make decisions amongst a range of choices. As I continue to search for knowledge, I pause briefly to provide an incentive to those whose efforts and spirits contributed to this piece of work. Although they are too many to mention in name, some deserve recognition here.

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## ANNEX 1: COST RECOVERY – EXAMPLES OF SUPPORTING POLICIES AND LAWS.

Supportive information from international organisations, treaties, and conventions provides some directions as to possible funding mechanisms for management services. Article 20<sup>27</sup> of the Convention on Biological Diversity, for example, calls for country parties to the convention to "...provide new and additional financial resources to enable developing country Parties to meet the agreed full incremental costs to them of implementing measures which fulfil the obligations of this Convention..." (UNEP 1992). The obligations of the Convention, in this sense, refer to financing mechanisms for the conservation of biological resources of which fish is one.

Andersen *et al.* (1998) reports that the United States federal and state governmental expenditures on fisheries is approximately US\$1 billion. Recovering costs of fisheries management is well documented within law and policy in the United States. Examples in this case include Magnuson-Stevens Fisheries Conservation and Management Act of 1996<sup>28</sup> (*Public Law 95-265 As amended through October 11, 1996*) and the Wallop-Breaux Amendment of 1984 under the Sport Fish Restoration Act of 1950 under the laws of the Federal State Government, among others. The sport fish restoration programme is funded by the revenues collected from levies. An excise tax on some of the items by the US Fish and Wild Life Service is returned to the states for managing fishing activities. The Wallop-Breaux Amendment (1984) led to establishment of the Trust Fund named the "Aquatic Resource Trust Fund" whose resources are generated through fish levies.

In the US federal state governments, there are laws that support cost recovery approaches. A legislative amendment by Florida State defines a legal option for the state to impose a levy as a source of revenue for financing water resources management. The Water Management Constitutional Amendment (1976) passed in 1975 by the Florida State legislature authorises the levy as a means of generating funds for water resource management. Basing on the argument that central government finance ministries allocate an inadequate percentage of resources required for natural resource management, most governments have approved policies and laws allowing natural resources (fisheries in this sense) to appropriate a certain amounts of money for management activities.

In some countries in Africa, cost recovery is generating a lot of attention as demonstrated by provisions within recent policies and laws. In Malawi for example,

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<sup>27</sup> section 2 of Article 20

<sup>28</sup> Section 304(d) of the revised Act permits two types of charges to be collected from the fishermen. The first is the charge for the issue of fishing permits by the states, where States administer the permit system. The states are able to charge a fee up to the level of the administrative costs incurred in issuing permit. The Act Authorises the collection of user fees on the Alaskan halibut and sablefish fishing malpractice. Andersen reports that the 1994 the US National Marine Fisheries Service (NMS) had attempted to obtain authorisation (through the Magnuson Act ) to collect general user fees from the fishing sector but failed. The 1999 revision by NMS was a provision to allow "collection (across the board) fees amounting to 1 percent of the landings".

National Fisheries and Aquaculture Policy for Malawi supports this. Section 22 of the Fisheries Conservation and Management Act 1997 introduces a Fisheries Research Sub-Fund as a cost recovery strategy. The legislation emphasised under the Finance and Audit Act (Fisheries Research Sub-Fund) Order of 1999 by the Minister of Finance (CAP. 37:01) emphasises cost recovery. In this order, section 4 sub-section (g), compels government to impose levies through a number of fishing activities to recover costs of management and research in Malawi.

The South Africa *Sea Fisheries Act 1998*<sup>29</sup> specifies that the costs of fisheries management are to be paid by the government, although contributions can be collected from industry for purposes of financing research. Government in this sense means that costs of fisheries management is to be paid by direct transfers from the national treasury as in most countries. In 1997, a Government White Paper (Hatcher et al. 1998) recommended that fishermen should contribute to the recurrent costs of all activities of the Sea Fisheries Department and the research and proposed that access rights be allocated through auctioning fishing rights. The rights were to be determined as a percentage of Total Allowable Catch (TAC), a system this is not different from ITQs in some countries.

Tanzania is currently implementing one of its policy<sup>30</sup> objectives on financing fisheries management from the fisheries sector's own resources. The current fisheries retention scheme, which is essentially a fish cost recovery scheme, is financing more than 98% of the fisheries research, management, and MSC activities.

The draft national fisheries policy for Uganda is clear about identifying funding mechanism for the fisheries sector (DFR 2000). Section 7.2.3 of the draft policy requires the state to "identify and implement sustainable funding mechanisms for improved fisheries management, research and development." In its policy strategies to achieve this goal, the draft states clearly how government shall institute a levy or royalty to be held in trust for the management of the fisheries sector, among other things.

Such examples and others elsewhere, demonstrate how states and governments have developed policies and laws that include specific provisions relating to cost recovery as an option for financing fisheries management. Although the literature reveals a few practical complications associated with such options, it is clear that approaching taxes differently, it may strike a different balance between the legislators and the taxpayers for purposes of financing fisheries management.

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<sup>29</sup> Act No. 12, 1988

<sup>30</sup> Section 5.1 subsection 5.1.1 of the National Fisheries Sector Policy and Strategy Statement for Tanzania, under the categories of funding, indicates how a revenue retention scheme will generate resources for financing both fisheries research and management activities in Tanzania. In fact, this retention scheme in Tanzania is a success story on how money retained from the key commercial fisheries activities is financing the fisheries research and management activities