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Governance and Welfare of Fishing Communities of Lake Victoria★

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Abstract

The increase in global demand for Nile perch and the resulting increase in effort, along with the rapid growth of the human population have created significant changes in the ecology of Lake Victoria. The integration of the riparian states around Lake Victoria has made it possible to rethink strategies that promote development by changing management strategies for sustainable fisheries. These include the introduction of a co-management system of Beach Management units (BMUs) which are elected by the fishing communities and will work with the authorities in developing management objectives. In order to achieve development goals, major new investment in infrastructure and technology are required particularly in gear, mode of propulsion and marketing, and the three states around the lake have developed priority programmes in order to create wealth, raise the living standards of the people of the region. In relation to this, the facilities available to the fishing communities were examined. The availability of cold rooms is very limited in the region as most beaches do not have potable water or electricity. Educational standards remain low and many communities lack proper sanitation, and are therefore at risk of disease, while most basic facilities such as hospitals, schools and clinics are not within their reach.

Key Words; Co-management, Beach Management Units, Lake Victoria, Health, Education,

Introduction

Lake Victoria has a surface area of 69,000 km^{2}and holds about 28,000 km^3 of water, making it the second largest freshwater lake in the world after Lake Superior (Howard, 1999). The lake is shared by three East African countries; Tanzania with 49% of the lake's area, Uganda with 45% and Kenya with 6%. Traditional fishing has been carried out by various ethnic groups living around the lake such as the Luo, Banyala and Abasuba in Kenya; the Baganda, Samia and Basoga in Uganda and the Sukuma, Majita and Haya in Tanzania (SEDAWOG, 2000).

Little is known about the state of the Lake Victoria fishery before the 19th century. Traditional fishing methods included crafts such as dug-out canoes and rafts made of buoyant logs tied together or of intertwined reeds and papyrus stalks. Some fishermen used spears to catch fish as well as baited traps, while others used hand nets in the form of baskets, as well as constructing barriers or weirs across streams and inlets to trap fish (Dobbs, 1927). These traditional methods in no way endangered the stocks of tilapia, which at the time was regarded as the most valuable fish species. Graham (1929) reported that "…the native methods do not catch '*ngege'* (tilapia) in any appreciable numbers." Because they were simple and cheap, many of the traditional fishing techniques have persisted to date.

Commercial fishing with gillnets began in the early 20th century and the lake now supports one of the world's largest inland fisheries, yielding about one million tonnes per annum, with three species dominating the catch: two introduced ones, Nile perch *Lates niloticus* (L.) and Nile tilapia *Oreochromis niloticus* (L.), and the endemic dagaa *Rastrineobola argentea* (Pellegrin).

Fish production from Lake Victoria increased dramatically from about 1980 onward because of the dramatic increase in the Nile perch population that began around then, while a further increase began about 15 years ago with increased catches of dagaa and other species

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(Figure 1). Most of the Nile perch catch is sold in the external market while the other species are sold both in regional and domestic markets. These changes in the fishery led to a great increase in fishing effort which in turn has affected the stocks of Nile perch, the most valuable species, raising concerns that it might now be overfished and necessitating the development of new management strategies.

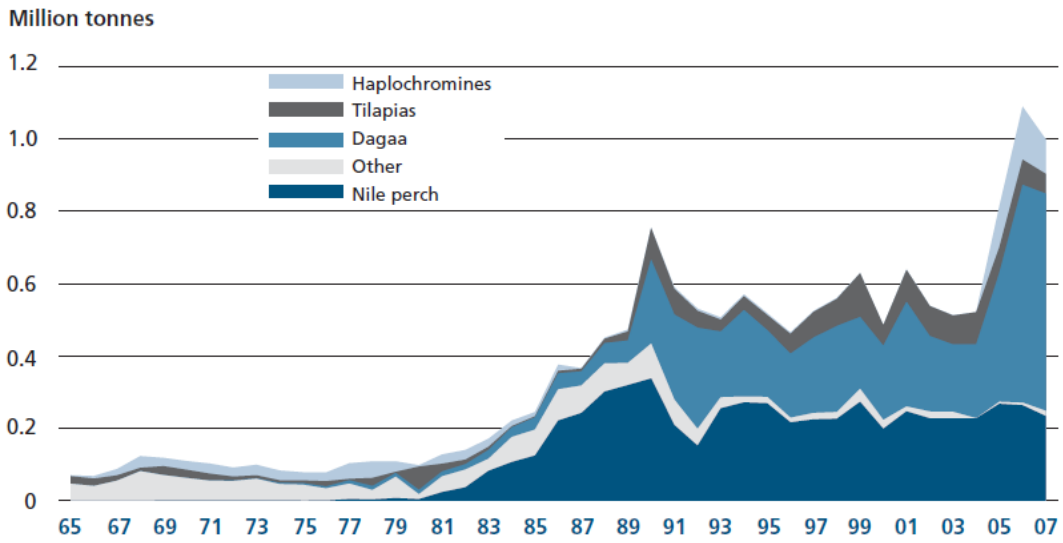

Figure 1. Fish catches reported from Lake Victoria, 1965-2007 (from FAO, 2008)

Geheb and Crean (2000) noted that Lake Victoria has been subjected to many powerful influences, among them introductions of exotic plant and animal species, a substantial increase in fishing effort, increasing integration into global fish markets, and the rapid growth of the human population in the catchment area which has increased land clearance, deforestation and other problems. All these make the task of managing the fisheries a daunting one and any system of governance designed to regulate a complex biological system like Lake Victoria must have as much variety in the actions being regulated (Ostrom, 1990, Geheb 1997).

It was also thought that the establishment of the introduced Nile *Tilapia* a return to larger meshed gill nets would lead to the recovery of the native tilapia species but this recovery did not occur. The question being asked now is whether the failure of these native species to recover is because of recruitment over-fishing, competition or hybridisation with the introduced species, or a combination of various factors. What seemed to have been missed is the development of the fisher folk's capacity to think for themselves, or to include their opinions in attempts to solve the problems of the fishery (Bugenyi and Balirwa, 1998). Because of this, fishermen continued to use small-meshed gill nets in shallow water, spent more time fishing and moved into deeper waters to improve their catches noted that the trend associated with fishing pressure resulting in the disappearance of large fishes and their replacement by small ones, in spite of all attempts to regulate the fishery (Abila and Jansen, 1997; Bugenyi and Balirwa 1989, 1998; Bwathondi *et al* 2001).

This paper is based on data collected by the three East African Research Institutes, the Kenya Marine and Fisheries Research Institute (KMFRI), the Tanzania Fisheries Research Institute (TAFIRI), and the National Fisheries Resources Research Institute (NaFIRRI) of Uganda. It was a component of the project for the Implementation of a Fisheries Management Plan for Lake Victoria coordinated by the Lake Victoria Fisheries Organization (LVFO).

Impact of World Markets on Fishing Communities

The increasing integration of the East African States into the global economy has brought economic change to the region, which has affected both the fisheries in the lake and the environment of the lake basin (Abila and Jansen 1997). The most important agent of change, in our view, is the rise of the export market for Nile perch, which is driven by four main factors. The first is the growth in the global demand for fish resulting from increasing consumption and the inability of other fisheries to meet this demand. The second is the new emphasis, especially from the World Bank and International Monetary Fund (IMF), on developing market

economies, which focuses on corporate and national profits with developing countries having to promote activities that give them a comparative advantage in the global marketplace.

The third factor follows from the second and is the result of the structural adjustment programmes promoted by the World Bank and IMF. This "economic medicine," prescribed in the West for sick economies in Africa and elsewhere has reduced incomes and the standard of living of many people living in the lake basin, with the poor and middle class being most severely affected. This is reflected by, amongst other things, by the loss of subsidies for education and health care, and the increasing prices of all imported commodities. Since few goods and services are free of imported components this fuels inflationary pressures, which are being experienced in all the countries around the lake.

This leads to final factor – the weakening of the regional currencies which means that exporters can increase their earnings, in terms of local currencies, from the foreign currency that they earn from their exports. This has therefore created new incentives to catch and export fish Harris *et al*., 1995). As the discrepancy between the value of local and foreign currencies widens so does the demand for exportable Nile perch fillets. The need for the local population, and even distant investors, to increase profits both to maintain their standards of living and to pay for expensive equipment in the fishery further fuels the drive to increase the catch.

In order to meet this demand major new investments in infrastructure and technology are required. Given the need to maximise exports these investments have been subjected to few government controls or local regulation and have not been required to provide economic, social, or environmental impact assessments. Furthermore, because of the uncertainties associated with African investment, there is a tendency for absentee investors in many East African enterprises to seek profits that would be considered exorbitant in most Western countries. These investors commonly hope to double their investment through profits in only one or two years. This expectation, and the behaviour it induces, favours short-term profit rather than the long-term sustainability of the fishery. In Kenya this may be observed primarily in the absentee ownership of larger and motorised boats and gear, while in Uganda it is reflected by a marked increase in the transport boat business.

We suggest that these factors, acting together, have had major impacts on the economic status and the quality of life of the people living around the lake. Some of them were able to take advantage of the new opportunities created by the fishery and some entrepreneurs with available capital have earned high profits, particularly fish agents buying fish at very low prices in the lake keeping the incomes of fishermen lower than what they should be earning. Just like in the Mweru-Luapula fishery in Zambia, a growing number of people and parties feature in the race for fish and a share in the related benefits. Regulations are increasingly ignored or circumvented. As the catches are falling, poor fishermen can only stay in the fishery by using unsustainable tendencies, particularly those that are not able to invest in deep lake fishing. Fish is the basis of life around Lake Victoria. It acts like a mine. It is a source of income to people. A lot of money comes from killing fish (Aarnink, 1999).

Regional approaches to fisheries management

The Lake Victoria Basin has been designated by the East African Community (EAC) as a Growth Economic Zone (GEZ) "to be exploited jointly to maximize economic and social benefits while ensuring effective environmental management and protection" (Shawki *et al* 2007). The second East EAC Development Strategy (2001-2005) set out the programmes for the development of the region, with the key priority being to "create wealth, raise the living standards of all people of East Africa and enhance international competitiveness of the region.

This will be achieved through increased production, trade and investments into the region (EAC, 2001). The strategy recognises the need to effectively include key stakeholders, and this will include enhanced roles in development for women, the private sector and civil society. The strategy is a wide-ranging document addressing key areas of co-operation, which in the productive sectors include: (1) ensuring food security and rational agricultural production in the region; (2) liberalisation of commodity markets; (3) increasing fish production; (4) reducing post-harvest losses; (5) improving the processing of produce, and (6) promoting Foreign Direct Investment in the region to support sustainable economic and social development. This was to be accomplished by preparing a Strategy and Action plan for the development of the Lake Victoria Basin, focusing on economic growth, poverty reduction and protection of the environment.

The Uganda government has prepared its second PRSP, known as the "Poverty Eradication Action Plan" (PEAP), which identifies the fisheries sector as a major contributor to poverty reduction and economic growth. The United Republic of Tanzania began the development of a national policy framework for poverty reduction in 1995 with the preparation of a National Poverty Eradication Strategy (NPES) and the Tanzania Development Vision. These documents were used in the preparation of an interim PRSP in 1999 and then a full PRSP in 2000 the "Poverty Eradication Action Plan" (PEAP) in 2004 firmly placing poverty reduction as one of the central themes of government policy. The basic tenet of the NSGRP is that economic growth is necessary but not sufficient for poverty reduction. It stresses that equity issues need to be addressed under an enabling environment of good governance. Kenya's programme was based on the Poverty Reduction Strategy Paper (PRSP) of 2001, a new 3- year development framework was set out in the "Economic Recovery Strategy

for Wealth and Employment Creation, 2003-2006" which presents the road map for economic recovery over 5 years and is focused on: rapid economic growth; strengthening institutions of governance; expanding the physical infrastructure; and investing in the human capital of the poor.

In these strategic plans drawn by the three states, fisheries occupy a central role as a resource that will spur regional economic growth. This change of strategy has given rise to changes in the management strategy for fisheries as set out in the Implementation of a Fisheries Management Plan (IFMP) project, funded by the European Union. Earlier on the World Bank had funded a programme for the purpose of managing the environment of Lake Victoria through Lake Victoria Environmental Management Project (LEVEMP).

Decision-making and co-management on Lake Victoria

Present conditions around the lake, with high population growth and increased expectations, tend to increase the aggressive exploitation of common property resources in the basin with a view to maximising short-term profit. This, of course, means that little attention is given to measures that guarantee sustainable use of these resources. This, we believe, has increased the pressures on all common property resources such as forests, wetlands and fish.

Resource management involves three basic areas of decision-making; conservation, regulation and allocation. Conservation decisions focus on limiting resource extraction to some level that will allow the sustainable use of the resource over time. Regulation decisions determine the mechanisms that control both the means and the rate of extraction. Allocation decisions determine the division of the resource between various user groups. The relative importance of each changes as the exploitation of natural resources develops with decision-making being sufficiently flexible to adapt to these changes. An example of this is the introduction of co-management on Lake Victoria after it became evident that existing resource management decisions were ineffective. It was believed that including stakeholders in making regulation decisions would increase compliance over time, and reduce management costs by making rules that are acceptable and considered legitimate by those whose activities are being regulated. To be legitimate, the content of regulations, the process by which they are made, the way in which they are implemented, and the impact of their enforcement must be perceived to be fair if equity and effective management is to be achieved (Hanna, 1995; Geheb, 1997; Crean and Geheb, 2000).

Since the late 1990s, the Fisheries Departments of the three countries bordering the lake have adopted a co-management approach to the fisheries, which involves sharing power with the users of the resource. This process has involved the formation of community-based organisations, known as Beach Management Units (BMUs), to allow fishing communities could participate in making management decisions. Everyone working in fisheries at a beach is required to register with a BMU and where there are fewer than 30 boats at one landing site several sites may combine to form a BMU. By 2006, a total of 1,069 BMUs had been formed around the lake, with 304 in Kenya, 554 in Tanzania and 575 in Uganda. Each BMU is required to democratically elect a committee, whilst complying with requirements set out in the BMU guidelines on its composition to ensure that all major stakeholder groups at the beach-level are represented. Previous beach-level organisations had been dominated by male boat-owners and it was believed that bringing in other groups, would serve more interests and allow wider participation in decision-making. Each committee is therefore required to consist of boat owners (30%), boat crew (30%), fishmongers (10%) with others such as fish processors, boat builders and net menders making up the balance. In addition, a minimum of 30%, and not less than three, of the committee members must be women.

Improving the welfare of the fisher community

Investment indicators are meant to improve in infrastructure and communication on complex issues between stakeholders in management. This means that the choice of sets of indicators should be directed at devising a useful toolkit to achieve sustainability in fisheries management, particularly in areas that will improve net return to investment in fisheries undertakings. Co-management cannot succeed in isolation but must be coupled with changes in policy and planning to modernise the fisheries sector, especially in relation to sanitation, all weather roads, processing and–marketing facilities together with information flow.

Access to potable water and sanitation is inadequate throughout the region; 57% of respondents in Kenya obtained their water directly from the lake, compared to 46% in Tanzania and 50% in Uganda (Table 1). Most of the beaches lack running water which is needed for the industry to meet the technical and sanitary measures of the World Trade Organisation (WTO), which have been used by developed countries to limit imports of fish that might compete those caught in international waters by their own fishing fleets. European Union directives, such as directive number 91/493/EEC, have set standards for the export of fish to the EU thereby legitimising the practice and conduct of fish trade, and ranking fish from Lake Victoria alongside other traditionally exported agricultural commodities (Yongo *et al.*, 2005). Facilities were provided at fishing villages by the Lake Victoria Environmental Management Project as a foundation for the Implementation of a Fisheries Management Project by the LVFO (Table 2).

Table 1. Access to water and sanitation among fishing communities around Lake Victoria. From LVFO (2007)

Drinking water Source	Kenya	Tanzania	Uganda
Lake	57	45	50
Shallow well	12	29	9
Piped and taps	13	8	10
Spring or river	13	16	9
Rainwater	4	1	0
Dam	1	1	22
Latrine at home	69	85	61
If no latrine at home, uses;			
Public toilet	4	28	39
Neighbour's latrine	11	20	8
The lake	2	2	0
The bush	80	47	47
Other	3	3	6

Table 2. Facilities available at landing sites (from LVFO, 2005)

	Kenya	Tanzania	Uganda
No. of landing sites	304	554	575
Banda (%)	25	5	4
Working cold-room (%)	<1	2	0
Other cold room (%)	2	6	<1
Pontoons/jetties (%)	4	4	1
Fish store (%)	4	3	2
Electricity (%)	4	4	3
Toilet facility (%)	59	13	7
Potable water (%)	7	5	7
All weather road (%)	22	30	23
Boat repair facility (%)	49	41	4
Net repair facility	35	38	<1

Disease among fishing communities

Respondents were asked how many members of their household suffered from various diseases and it is clear that a wide range of diseases were experienced by most households (Table 2). These data are difficult to interpret, however, because the average size of a household was not clear and the respondents were not asked if the disease had been diagnosed by a qualified doctor. Nonetheless, malaria and diarrhoea were evidently common problems but the results do not adequately illustrate the impacts of these diseases on the fishing communities, particularly from HIV/AIDS which is almost invariably fatal if not treated adequately. This may be as a result of stigmatisation of sufferers from this disease. Only two respondents said that they have tested positive and that their spouses are aware about their situation and are on medication. In this view, we believe, though the respondents know that the pandemic is affecting every one, the problem of stigmatisation is still prevalent among many people in the fishing communities and is rarely discussed by them.

Table 3. The mean number of people per household said to have been affected by various diseases/illnesses during the last year (LVFO, 2006)

	Kenya	Tanzania	Uganda
Malaria	4	3	4
Bilharzia	2	2	2
Tuberculosis	1.	1	2
Convulsions	1.	1	2
HIV/AIDS	2	2	2
Diarrhoea	2	2	3
Typhoid	2	2	2
Cholera	1	2	2

Other infrastructure and services available to fishing communities

Most of settlements on the shores of Lake Victoria are unplanned and situated in major bays and gulfs where fish breed (Yongo 2000). Fishermen tend to be migratory there are relatively few permanent dwellings; only 8% in Kenya compared to 25% in Tanzania and 26% in Uganda (Figure 2). This, combined with the inadequacy of sanitation, lack of potable water in the fishing villages there are constant threat from water-related diseases outbreaks such as cholera, typhoid and diarrhoea (Table 3). We cannot survive without water, but it has to be clean water because many life-threatening diseases are carried in contaminated water.

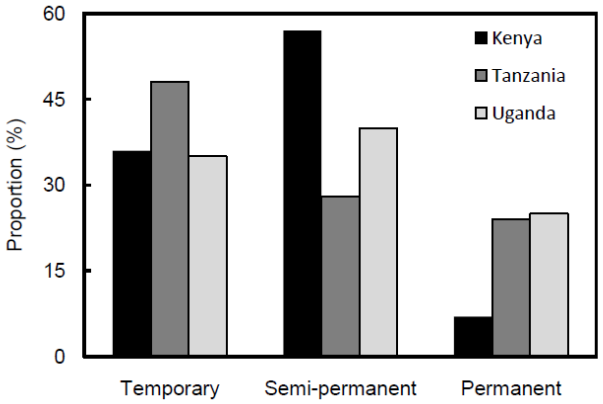

Figure 2. Type of houses owned by fishing community (from LVFO, 2005)

The major cause of contamination is human waste that has not been disposed of correctly, usually because of inadequate sanitation. The resultant diseases are spread through poor hygiene due to unplanned houses, sometimes just bordering the shoreline putting entire fishing village(s) at risk. It has been noted in Uganda that the existing sanitary

facilities and practices in the urban centres and many rural settlements cannot protect the population from water born diseases related to contamination of surface water sources with human wastes. Waterborne diseases (e.g. cholera and typhoid fever) have become rampant as a result (Yongo 2000; Muyodi *et al* 2009).

Educational standards of the fishing community

The levels of education of the fishing communities were generally very low. In Kenya and Tanzania, 8% of respondents did not have any form of education while in Uganda 13% had no education. Of those who went to school, 32% of respondents in Kenya did not finish their primary school, compared to 10% in Tanzania and 28% in Uganda respectively.

In this regard we see that level of education of a community is a very important aspect in so far as general welfare of a community is concerned and the low levels of education among the fishing community and the nature of ailments demonstrates this fact. Moreover, there is considerable international evidence that education is strongly linked to health and to determinants of health such as health behaviors, risky contexts and preventative service use (Feinstei *et al*, 2005). Beliefs about health, coping strategies, and risky behaviors have been identified as important to the promotion of health and a large body of evidence links education with health, even when other factors like income are taken into account (Egerter, *et al* 2009).

Most primary schools, especially in Kenya and Tanzania, were located within "this village" while in Uganda a higher proportion were located in a nearby village (Table 4). A much smaller proportion of secondary schools were located in the villages and most were located further away in the ward or district. The distribution of educational facilities may explain why there the levels of education levels are low among the fishing community, since many settlements are remote or, particularly in Uganda, located on islands, of which there are more than a thousand on the lake.

Table 4. The location of primary and secondary schools in the fishing communities of Lake Victoria (from LVFO, 2007).

	Primary school			Secondary school		
Location of school	Kenya	Tanzania	Uganda	Kenya	Tanzania	Uganda
This village	79	82	57	35	31	22
Nearby village	7	7	28	35	0	26
This ward/location	14	11	14	27	54	39
This district	0	0	0	4	15	13

Table 5. The location and ownership (%) of community halls in the fishing villages around Lake Victoria (from LVFO 2007)

		Kenya	Tanzania	Uganda
Ownership	Government	0	71	68
	Voluntary agency	14	0	5
	Private	86	29	26
Location	This village	63	64	11
	A nearby village	13	0	21
	This location or ward	25	9	42
	This district	0	27	26
Frequency of use	Always	54	92	95
	Never	38	8	5
	Sometimes	8	0	0

Most of the primary schools are government owned (100% in Tanzania, 93% in Kenya and 78% in Uganda) with the balance being owned by voluntary organisations or were privately owned; the latter accounting for 15% of Ugandan schools. The primary schools were used by most respondents (1005 in Kenya and Uganda, 97% in Tanzania).

Facilities such as social halls were not provided by the government in Kenya but in Tanzania and Uganda a high proportion (71% and 68%, respectively) were provided (Table 5). Tanzania has a well established system of village government, *Nyumba Kumi* (Ten Villages), so in that country the establishment of BMUs had a natural foundation from the start (Medard and Wilson, 1996). Fishing communities also refer to private facilities as halls, and use them for video shows and live performances and there is a considerable proportion of them in the three states, especially in Kenya where there are no public facilities. These facilities are important for the beach communities, because, in addition to their recreational and social uses, they can be used for public education, health issues and general administration as well as discussions on fisheries management. In Uganda and Tanzania, the facilities are in use almost all the time but they are used much less in Kenya.

In all three countries government-owned dispensaries, are present in most villages, although there was a higher proportion of private ones in Tanzania (Table 6). In Kenya and Tanzania, about two-thirds of the villages had a dispensary but only 11% of the villages in Uganda had a

dispensary; here two-thirds of dispensaries were further away either in the ward or the district.

Table 6. Distribution, ownership and functionality (%) of dispensaries on beaches (from LVFO, 2007).

		Kenya	Tanzania	Uganda
Ownership	Government	81	68	85
	Voluntary agency	10	12	4
	Private	10	20	11
Location	This village	38	56	30
	A nearby village	28	4	22
	This location or ward	29	28	41
	This district	5	12	7
Operating frequency	Always	81	-	96
	Never	19	-	4

Most respondents seemed not to know the difference between dispensaries and clinics, and so data on hospitals may be unreliable. Most hospitals (100% in Tanzania) were government-owned but villages were poorly supplied with medical services (Table 7). In Tanzania, over one-third of the villages had a hospital but the villages in the other countries had very few. In Kenya nearby some hospitals were located in nearby villages and in the same ward but in Uganda and Tanzania they were mostly elsewhere in the district. Finally, they operated continuously in Tanzania and Uganda but in Kenya nearly one-third of respondents indicated that the hospitals never functioned.

Table 7. Distribution, ownership and functionality of hospitals among the fishing community (from LVFO, 2007).

		Kenya	Tanzania	Uganda
Ownership	Government	95	100	84
	Voluntary agency	0	0	16
	Private	5	0	0
Location	Within this village	4	38	10
	A nearby village	27	0	5
	This location or ward	23	0	24
	This district	46	63	61
Operating frequency	Always	73	100	100
	Never	27	0	0

Conclusion

Fisheries management requires an assessment of the economic consequences of any management action. A primary requirement is to estimate the value of the fishery and incorporate various options for the allocation of the resource and the extraction of its rent through the determination of the management unit and the production units within it. Any governance must be tailored to the requirements of a particular fishery and the perception of resource users. Bringing a co-management arrangement into operation is likely to be a delicate, long term process given the nature of the resource base and divergent interests of multiple user groups and other stakeholders. It also has to be guided by the regional priorities of the East African Community member states. Building participatory management systems is a learning process for the parties' involved involving historical and political setting for member states.

Both ecologists who stress preserving the integrity of the ecological subsystems for the overall stability of the ecosystems to sociologists who emphasise people and their patterns of social organisations must rely on the local communities to create management systems which are critical in devising viable means of attaining sustainable development require social capital. Any investment in the fisheries system that does not recognize the creation of the infrastructure that will add value to fisheries output and outcome is bound to be unsustainable. We notice that the provision of "external drivers" that may help the fisheries by providing basic facilities which can offer an opportunity for arriving at more effective and sustainable management system is uncoordinated and not well planned.

It has been noted that most of people involved in the fisheries sector are not well educated. While this cannot be provided to the people involved presently, it is evident that education does not act on health in isolation from other factors. Income is another very important factor that interacts in many important ways with education as influences on health. We recommend therefore, that those who provide basic education on health and sanitation should do so with regularity and intensity.

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