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Freedom and poverty in the fishery commons[1]

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Abstract: Poverty was at the heart of the tragedy of the commons discourse from the very beginning. The idea was that commoners would inevitably end up deprived due to their own resource overuse. As Hardin saw it, if the initial problem was freedom of the commons, then limiting that freedom would logically reduce poverty. In this article, we argue that alleviating poverty among resource users calls for a broader concept of freedom than Hardin's – one that is more in line with that of Amartya Sen's "freedom as agency." Based on case-studies of small-scale fisheries and poverty in Bangladesh and Tanzania, we claim that the root of the tragedy of the commons is the restriction of freedom rather than unlimited freedom and that it is arguable whether the people who have no other option than to continue fishing for their livelihood, even in over-exploited ecosystems, could be understood to be free.

Keywords: Capability deprivation, common pool resources, governance, poverty, small-scale fisheries

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"*Freedoms are not only the primary ends of development, they are also among its principal means*." Amartya Sen (1999, 10)

1. Introduction

In his 1833 Oxford University lecture series, William Foster Lloyd explained poverty by using an analogy between a pastoral commons and the English labour market and between a calf and a human child where the calf is equipped with "a set of teeth and the ability to graze" and the child with "a pair of hands competent to work" (Lloyd, in Hardin and Baden 1977, 11). In both instances, unlimited access would inevitably ruin the commons – whether that is the pasture or the labour market – and create human misery. Inspired by Lloyd, more than a century later Garrett Hardin (1968 and 1998) argued in a much cited quote that "freedom in a commons brings ruin to all." Consistent with bio-economic modeling of human behaviour in open access fisheries (Gordon 1954), this statement has inspired researchers and practitioners alike to believe that limiting the freedom of access and operation in the fishery commons is the key to sustainable resource management and poverty alleviation among small-scale fishers around the world.

In this article, we argue that in order to sustain the resource while alleviating poverty among small-scale fishers – and indeed for common pool resource users in general, a broader idea of freedom than Hardin's notion of "freedom in a commons" is needed. We suggest instead a concept more in line with what Amartya Sen[2] proposes in his book "Development as Freedom", that is, freedom as agency (Sen 1999). Unlike what Hardin proposes and fishery resource management worldwide has embraced, Sen's concept leads to a governance approach that intends to enhance the freedom of small-scale fishers rather than to limit it. Where Hardin recommended a mechanism that would effectively close what is often the last free space of manoeuvre for deprived small-scale fishers, in Amartya Sen's conceptualization, fisheries governance would be about providing small-scale fishers with the "entitlements" and "capabilities" they need in order to live better.

Drawing on case studies of small-scale fisheries in Bangladesh and Tanzania, we aim to demonstrate the relevance of Sen's broader concept of freedom as being the one that should underpin resource governance and poverty alleviation. The two studies show how small-scale fishers are in need of a great number of entitlements and capabilities that are essential in order for them and their dependents to enjoy secure livelihoods and "to lead the kind of lives that they value – and have reason to value" (Sen 1999, 18). Under conditions that are both similar and dissimilar in the two situations, small-scale fishers face a limited set of opportunities and entitlements, many of which are obvious targets for governance reform. They are also short of a number of capabilities that they would need in

[2] Amartya Sen is the 1998 Nobel Price Winner in Economics.

order to sustain their resource and pursue alternative or additional sources of livelihood. Following Sen's analysis of the elements constitutive of freedom and essential for development, the presentations are organized around the following issues: a) eco-system characteristics and pressure on resources; b) social and economic opportunities and capabilities, and; c) institutions and entitlements. Sen's framework is then the heuristic we use to reflect on the lessons learned with regard to the governance of common pool fishery resources and poverty alleviation among small-scale fishers.

2. Bangladesh: The South-eastern Coast

"First we have to survive, then the question of education"

The following analysis is based mainly on Islam (2008).
a) Eco-system and resource pressure: In Bangladesh, small-scale fisheries account for about 1.5 million fishers and ~10 million more people who live in households indirectly dependent on fisheries for their livelihood. Small-scale fisheries in the Bay of Bengal contribute about 93% of the total marine fish production in Bangladesh (BBS 2006; Bangladesh Economic Review 2008). The species Hilsha (*Tenuolosa ilisha*) constitutes the largest single fishery in Bangladesh, contributing about 16.4% of the country's total fish production. The Hilsa is moderately sized (up to 60 cm in total length and up to 2.5 kg in weight) and obtains a high price in local and international markets. It is estimated that about 2 million fishers and traders are directly and indirectly engaged in Hilsha fisheries. Most small-scale coastal fishers rely on these fisheries for their yearly income (Kabir 2006). The Hilsha fishery is seasonal with the peak season lasting for only about four months of the year. During the other eight months, small-scale fishers mostly use set bag nets to catch other species, which are short-lived and small-sized (e.g. Sergestid *shrimp, Acetes* spp.).

The Bay of Bengal is one of the most disaster prone regions in the world. Cyclones and tropical storms are yearly phenomena. In addition, the tidal activity is becoming increasingly turbulent making fishing operations risky and limited. Rough seas, as well as frequent cyclones often force coastal fishers to stay home or to abandon their incomplete fishing trips. Yet, due to very limited options for survival, many fishers defy warnings and continue fishing, which results in many fatalities every year (Ahmed and Neelormi 2008). Thus, small-scale fishers are not only poor; they are also extremely vulnerable. Their communities are often isolated, usually located near their workplace on the beach or nearby *khas* (government owned) land. This makes them predisposed to natural disasters. When disasters strike, families have to rebuild their lives and livelihoods from scratch. Limited finances make it difficult to restore homes and infrastructure. The loss of fishing gears, boats, livestock and other household assets can wipe out livelihoods. Moreover, the accompanying loss of paddy fields and other food

source can worsen food insecurity along the coast, which often leads to health problems. The death of a household member capable of working can bring the whole family into extreme poverty and extended trauma.

Fishers ultimately cope in the only way they are capable of, that is by putting more pressure on common pool marine resources. Some of the strategies only exacerbate their vulnerability by depleting the resource base. For instance, the set bag net widely used by small-scale fishers along the coast of Bangladesh has been blamed for catching undersized fish due to the use of a small mesh. During the breeding season, many species (including Hilsha) are also targeted. Fry collection (of very juvenile shrimp species) continues despite a ban. Illegal fishing (e.g. catching juvenile species of Hilsha) and the use of illegal gears (e.g. monofilament fishing nets) are also widespread, and in some cases, fishers pay bribes to the local law enforcement personnel. At St. Martin's Island, which is a protected area, the collection of seaweed and coral extraction continues to defy an existing prohibition. During the lean season, people also try to earn extra money by targeting previously non-targeted (e.g. shark species) and protected species (e.g. lobster).

b) Opportunities, capabilities and agency: Due to their distance from public facility hubs, fishing communities along the coast are usually the last to gain from economic development. They are also unlikely to reap the benefits of rehabilitation programs, such as food for work, unless such programs specifically target fishers. Fishers lack alternative capabilities to fishing and are therefore generally reluctant to seek other jobs. Sometimes in order to receive assistance, such as cash or ration cards for food, they have to bribe the local government official concerned. There are critical food shortages, particularly after a cyclone, and erratic production exhausts fishers' savings and entraps them into debt.

Sen argues that it is important to assess capability deprivation at a lower level than the household and that women's empowerment and freedom is essential to development (Sen 1999, 115). The erosion of income from fishing has increased the participation of women in income generating activities, like fish marketing or fish drying, and women have in many instances become the financial mainstay of the fisher household. Many young girls work in readymade garments factories. Although women in fishing households increasingly become active in income generation, they still suffer from discrimination in many ways. For instance, the wage paid to women in this area is usually much lower than what their male counterpart earns for doing the same job (see also Kleih et al. 2003). Women are frequently cheated when selling of fish products. Another problem is the dowry required when a daughter gets married. Girls are considered to be a liability and the number of daughters is perceived as an indicator of poverty.

A number of other entitlement shortages also limit the opportunities of small-scale fishers and increase their vulnerability. Given the fact that about 54% of the coastal communities in Bangladesh are functionally landless and more than 30% are absolutely landless (Islam 2006), most of the coastal fishing families

are also landless. They do not enjoy the insurance that ownership of land (an "exchange entitlement" – Sen 1981) can offer against a sudden loss of livelihood options. The few who do possess land only have a marginal quantity and since it is insufficient as a means for generating additional income, it is mostly used for family settlement. Another entitlement deficiency is the poor transportation system that inhibits fishers from having easy and expedient access to the markets. It also paves the way for the money lender – the *dadondar* – to gain bargaining power over them. As a consequence, fishers lose. For example one fisher from Teknaf coast of Cox's Bazar district said: "*Here, our fish are cheaper than water. Due to poor transport from here to Teknaf market, we are deprived miserably to get the price of product. Can you imagine only 10 BDT/kg fish (*about $0.15/kg*)? The same fish can be sold 100 BDT (*$1.45/kg*) in Teknaf market (only 7 km away from here).*"[3]

Good health is essential for generating income, but frequent bouts of illness often impair fishers' capability to work. Causes of the most prevalent illnesses can usually be linked to lack of knowledge about and access to proper sanitation. Sanitation facilities in fishing villages are poorly developed; most households use pit latrines. Illness, especially among the earning members, is one of the major causes of families getting pushed into poverty. It often leads to family bankruptcy and even poorer health because the cost of medicine is often paid by reducing the frequency of meals or, in extreme cases, with the starvation of family members.

Livelihoods of fishers are also vulnerable because of the risk of sea piracy. This risk is particularly severe during the Hilsha fishing season. Sometimes fishers are kidnapped for ransom. Fishers are always afraid of being assaulted, and they are particularly concerned that someone will snatch their productive assets like boats or nets. Ironically, the pirated property is then sold back to the fishers through brokers or through their own contact with the robbers. Elected local government officials tend to be blind to the welfare concerns of the fishing community. One fisher from Katghar in Chittagong district complained about local government representatives: "*They just come to us when they need our votes for election. After being elected they just forget us. Even if police harasses us in front of our commissioner, he doesn't protect us. We are unable to elect our own representative as we do not have power and money. We do not even have a suitable candidate from our own community because we are all illiterate."*

As in many other rural communities, the rate of illiteracy in fishing communities is very high. Schools are in many cases inaccessible due to the poor condition of the roads and/or long distances. Other impediments for children to complete school include large families and the subsequent educational expenses and the necessity for the children to work to supplement the family income. As stated by one fisher: "*I know that to educate children is a good thing. Since I am poor, I have to take my child fishing because I need a helping hand. If I hire another*

[3] Interview in a Bengali daily newspaper, Prothom Alo on 4th February, 2008.

person to go with me I have to pay the wage even if I do not get any [fish]. *For example today we* [he, his wife and child] *earned 170 Taka* [about $2.5] *for two day's fishing. If I took another person* [required if he sent his child to school] *I had to pay him at least 100 Taka* [$1.5]. *How is it possible to maintain my family of six members with 70 Taka* [$1] *for two days?*"

Fishers' access to the formal credit market (i.e. banks) is very limited due to lack of collateral assets like landed property; therefore, they are dependent on informal credit mechanisms. The informal *dadon* system has been blamed for exploiting the fishers. *Dadon* is a transaction built upon an uneven lending contract (often verbal) between the fisher and the lender. The transaction favours the lender/purchaser, because even before production the fisher has to agree to sell the produce to him at a price much lower (i.e. usually about 20%–40%) than the normal market price or against a certain percentage of commission (e.g. 5%–10% of sales revenue). The *dadon* is considered to be an advance or loan for the fishing season and binds the fishers to the money lender. This means that regardless of the amount of money owed, the borrowers must give all the fish they catch to the *dadondar* who gives them the loan and they must accept the price that he determines (Habib 2001). If they try to bargain, the money lender will just reduce the price of the previous bid as a form of punishment. Thus, the *dadondar* becomes the *de facto* owner of the family's productive assets and fish catches. He will allow at least three fishing seasons for the loan defaulter to repay loans. If there is a failure, the *dadondar* may confiscate the fisher's productive assets like boats, nets, home or homestead land. A fisher said: "*Dadon means selling everything to the Paiker* (the word for money lender). *It is not only your fish but also your freedom, boats, nets, etc. But we have no way of being free from it"* (quoted in Alam 1996, 109).

Poor representation of coastal communities in the power structure is another capability handicap (Kleih et al. 2003). The small-scale fishers of the south-eastern coast of Bangladesh are for the most part not well organized. The existing traditional organization (*samaj*) is not effective enough to promote their interests, as they have poor representation in the local administrative structures. Many fishers reported that high installment and maintenance fees were impediments for joining cooperative organizations (Islam 2006). Some fishers also blamed the *dadondar* who would not want them to have such an organization out of fear of losing control. Also, Bangladesh is well known for its non-government organization (NGO) activity, but comparatively few NGOs work with coastal fishers (see also Kleih et al. 2003, 93). One reason for limited NGO assistance is the geographical remoteness of fishing communities. Another reason is that fishers, due to uncertain incomes, have difficulties serving debt even on microcredit, an arrangement that has overall been very successful in supporting the poor in Bangladesh, particularly women (Sen 1999, 201).

c) Institutions and entitlements: Poor governing institutions are the most important development constraints in Bangladesh (DFID 1998, quoted in Kleih et al. 2003).

In contrast to inland fisheries where a number of management approaches have been tested, coastal small-scale fisheries in Bangladesh suffer from a chronic lack of well-planned management and governance initiatives. The existing governance structure is top-down, and the management bodies prioritize economic benefits while largely ignoring the complex marine ecosystem. The management system is short on manpower for monitoring, evaluation, and supervision, which is a major impediment for effective implementation of development projects in small-scale fisheries (Islam 2003). Similar to the situation in other developing nations, there is in Bangladesh a shortage of resource management expertise in proportion to the pressures that coastal fisheries are exposed to. Scientific expertise and advice are not much recognized by policymakers and management agencies (Islam 2003). Finally, and above all, population growth has fuelled the overexploitation of coastal fisheries and increased the risks of governance failure (Islam 2003).

Marine fisheries are mainly regulated by the Marine Fisheries Ordinance of 1983. According to this ordinance, small-scale coastal fishers can fish in the coastal waters within 40 m depth at the highest tide. The ordinance excludes industrial trawlers from this zone. Small-scale fishers can also use the nearby beach area for fish landing or ancillary work. Even though traditionally small-scale coastal fishers enjoy open access to fisheries resources, their access is often restricted, still. For instance, industrial fishing trawlers who are supposed to fish in waters beyond 40 m depth often fish much closer to shore where they are not allowed (at 30 m and even up to 20 m depth). Fishers interviewed for this study complained that their fishery has suffered when their areas are invaded and their nets are destroyed by the industrial trawlers and that conflicts have been escalating.

This ordinance fixes the mesh size of most commonly used small-scale fishing gear, for example, the set bag net as 30 mm at the cod end. The ordinance also prohibits fishing with underspecified mesh size, with any kind of explosives, poison and other noxious substances, or by electrocuting any type of the marine species. Similarly, there is a ban on collecting shrimp fry from natural sources, a practice widely blamed for the massive destruction of other fish fry and fish populations as by-catch. But shrimp fry collectors are mostly poor, uneducated and marginalized people in coastal communities (Ahmed et al. 2010). Efforts to enforce this ban are foiled when taking into account the socio-economic conditions of the shrimp fry collectors, as well as the lack of proper guidelines and scope for the rehabilitation of fry collectors (Islam 2003).

As an open access fishery, there is no state-allocated legal ownership of the fishing area. However, small-scale fishers maintain socially organized, locally enforceable, and hereditary entitlements in the fishing area within their community. This system, known locally as *Pata*, has been used as a way to avoid chaos and conflict among fishers regarding access and use of fishing space. The *Pata* is subdivided into smaller parts known as *Faar.* It is *Faar* that grants the fishing rights to each fisher, which is a practice that has been going on for generations. Even though this resource use right is transferable and can be sold for cash or

in-kind, it is not legally endorsed by the state. Further, this fishing entitlement is facing difficulties due to pressure of the increased population, new entrants into the fishery as well as intrusion by industrial fishers.

Summary: The Bangladesh case study is as much about vulnerability as it is about poverty. Both are closely linked but not exactly the same. Natural disasters are frequent and hard to escape. When their assets are destroyed, small-scale fishers have to rebuild their lives, but entitlement and capability deprivation, the lack of support or alternative skills to fishing, keep them trapped in a resource dependency that lead them to increase the pressure on the marine ecosystem, often by using destructive gear or targeting protected species. New entrants into the fishery add to this problem. But small-scale fishers' vulnerability is also exacerbated by social mechanisms, such as underperforming institutions and lack of the security that ownership to land provides. Without a functioning health care and welfare system, the death or illness of a family member may be disastrous. In many instances fishers' livelihoods are exposed to maltreatment by middlemen or government officials unable to provide "protective security" as a basic instrumental entitlement (Sen 1999, 184–185).

3. Tanzania: Lake Victoria

"*If we can break our dependency on fish agents, it would probably be possible to get better prices for our catches*"

The case study is based mainly on Onyango (2004).
a) Eco-system and resource pressure: With a surface area of about 68,800 km^2, Lake Victoria is Africa's largest freshwater lake. It is shared between Kenya (6%), Tanzania (51%) and Uganda (43%) (RoK, RU and URT 1995). Fisheries and agriculture are the dominant socio-economic activities within the lake area. Fishery biologists have noted high natural productivity, which has resulted in some of the greatest diversity of endemic species of cichlids (Johnson et al. 2000). This has changed over time, however, and the lake is currently dominated by three commercial species, namely the introduced Nile perch (*Lates niloticus*), Tilapia (*Oreochromis niloticus*) and small pelagic sardines (*Rastreneobola argentea*) (Cowx et al. 2003; Njiru et al. 2005).

Lake Victoria is very important to the economies of its riparian states, with an estimated annual fish landing of 778,840 tons, worth US$366 million at the beach, i.e. before any value addition (LVFO 2005). According to a statistic in 2005, the lake fishery supports large fish exports estimated at 100,914 tons of Nile perch valued at US$306 million annually. The lake provides high protein food, employment, income, and water for domestic and industrial use. The dynamics of the fishery of Lake Victoria have changed considerably since the beginning of the Nile perch fishery in the late 1970s (Acere 1985, 1995) and

the subsequent evolution of fish processing for export. The readily external market for Nile perch has fuelled rapid increase in fishing effort. Fish export is among the major foreign exchange earners of the partner states.

In Tanzania, the lake fishery involves an ever increasing number of fishers, from 55,985 in 2000 to 105,019 in 2008. Likewise, the number of fishing crafts increased from 15,490 in 2000 to 30,205 in 2008 (LVFO 2009). The lake has also provided the major part of the overall fishery contribution to the Tanzanian economy, generating an average of US$100 million to the central government on an annual basis since the late 1990s (Onyango 2005, 2009).

Despite these contributions, many fishing villages are still deprived of a number of capabilities and entitlements that they need in order reap the benefits of these resources. Many of the communities are reached only by dirt roads which are hardly passable during the rainy season. They have inadequate healthcare facilities and water supply. Fishers and their families remain inadequately nourished and are not protected from avoidable diseases. They also have no sustainable energy for cooking, and they have to cope with extreme natural events including floods, tropical storms and crocodile attacks. It is also a paradox that the price of fish that fishers earn is only 1 USD/kg of fish (Odongkara et al. 2005) when the reported wealth that fisheries generate for the riparian countries is so immense (Barth 1997).

We describe how this paradox and the consequences that follow have transpired in two Lake Victorian communities: Wakerewe and Kakseru. Wakerewe is among the oldest communities settled on the biggest island of the lake. The Wakerewe people are known historically to cherish cichlid fishes (Onyango 2004). The Kakseru settled in the lake region after the Wakerewe. They were not historically a fishing community as the Wakerewe had been but learned to fish when they arrived in the lake area.

The changes in the fisheries of the lake, which has seen a complete shift of fish stocks composed of cichlids to stocks composed of Nile perch, major predators of native cichlids (Kolding et al. 2008), have led to a situation where fishers in these communities can only fish for Nile perch, Tilapia, and Dagaa (Sardine). From our observations, these species are targeted mainly for trade, which has stimulated an increase in fishing effort. Nile perch goes to processing establishments for export. Dagaa finds a local market in the production of animal feed (Abila and Jansen 1997). Tilapia, which is the only species that remains for local consumption, has attracted more and more fishers because it is now in high demand at the local hotels. The rise of the number of visitors to the area and the increasing demand for fish by hotels have reduced the availability of these species to the local communities. Therefore, as Geheb (2008) reports, malnutrition in the lake region can in part be explained by the dynamics of the fish market.

A shift in the species composition has also led to changes in fishing gears and techniques. Gears, such as basket traps and spears have been replaced by gillnets, drift nets, long lines and beach seines (which are illegal in the lake). Fishers have

also developed drift netting, expanded the width and length of gillnets (including changing from nets made of cotton thread to those made of nylon), and increased the number of fishing days and the length of time they leave their nets in the water each day. Fishers have also mechanized their operations to enable fishing in deep waters. Some of these gears and fishing methods lead to overfishing and degradation of fish habitats (LVFO 2009).

b) Opportunities, capabilities and agency: The boom of the Nile perch has strongly impacted on the nature of the fishery of the lake (Ligtvoet et al. 1995). Besides the changes in fishing gear, fillet processing industries have been established. The boom has also attracted people from non-riparian communities into the fishery where livelihoods are in short supply in local communities. The poor performance of agriculture due to drought and seasonal lack of rain, a crisis in the mining industry, and limitations to local participation in the tourism sector in the lake region, have led to entry into the fisheries from these other sectors (Geheb and Binns 1997). In fact, lake fisheries have become the only opportunity available and a valuable safety-net for people once involved in farming or mining.

Formally, the fishery in Lake Victoria is open access. People regard the provision of food a God-given entitlement. Among the Kakseru for instance, the demand for *mboga* (a Kiswahili word for the main dish in a meal) coupled with the limitation of the food supply have led fishers to follow the principle of not hindering others from fishing. A fisher is allowed to catch to feed his family, and no person has the right to stop another person from fishing. Fishers, therefore, discourage controls on access, and they will normally abstain from reporting on their fellow fishers when using illegal fishing gears such as beach seines, small-sized nets and monofilaments.

The notion of open access, however, has not transpired into a functioning freedom because the capital outlay capability required to fish is indeed colossal. In order to fish, a fisher needs a boat and fishing gears, costing anywhere between US$800 and US$1500. People who cannot afford the investment in boat and gear can still become crew on larger boats that operate offshore. The owners of these vessels provide crew members with only the most basic needs, such as shelter and food.

Low educational attainment is among the key capability deprivations characterising the Wakerewe and Kakseru small-scale fishers. Most of them have only some primary/basic education and many are illiterate (Onyango 2005). Working in fisheries does not require any skills that would be gained from going to school. When asked about education, one fisher said: "*Why should I have to go to school when I can make money from fish?*" A majority of those who get past the primary level still come back to the fishery and therefore create a perception that there is no reason for wasting time and money on education beyond the primary level. Fishers are therefore born into families where members have low education and they grow up among people who reject school and who do not perceive education as a means of generally improving their livelihood capabilities.

Fishers are trapped in a relationship with the middlemen (known in Lake Victoria as agents) who buy from the fishers and deliver to the fish processing establishments. The agents have designed a mechanism whereby they provide loans to fishers so that they can buy fishing gear, outboard engines and/or fishing boats and then the fishers are expected to repay the loan by selling all their catches to the agent. The agents also determine the price of fish that they are willing to pay. There are times when the agents hold back their payment until the fish is sold to the processing establishment. When time comes to pay, agents sometimes do not have the proper records of the total weight of fish and instead pay according to their own recollection. Fishers do not have proper mechanisms to bargain for higher prices and if they try to create one, the agents will come up with stringent conditions so that they can keep controlling the relationship. Therefore, fishers are rendered powerless and frustrated. All they are capable of is to accept what they are offered while striving to survive.

c) Institutions and entitlements: The Lake Victoria fisheries have been managed through single species models and a top-down, centralized system (Geheb et al. 2002; Kolding et al. 2008). Regulations are for the most part focused on the Nile perch and Tilapia. Gillnets were used as far back as 1908 (Geheb 1977; Njiru et al. 2006). The legal mesh size for this gear was recently increased from five to six inches. The legal six-inch mesh size gillnets target Nile perch and Tilapia fishes of between 50 and 85 cm total length. However, the currently resurging cichlids (Witte et al. 2000) are not within the length range that the six inch gillnets can catch, which has limited the catching of these species and subsequently, the freedom to fish for all the available resources in the lake. This has led to conflict with fisheries authorities, especially when fishers resort to use small-size gillnets to catch cichlids.

Although rarely documented, corruption in fisheries, including those in Lake Victoria, is recognized to be an issue (Standing 2008). With the commercialization of fisheries as a result of the Nile perch boom and an observed decline in catches, fishers have resorted to using illegal gears, such as beach seines. Other illegal fishing gears and techniques have also been recorded.[4] Some fisheries personnel working to eradicate these illegal gears and techniques have been compromised by receiving payments to either release confiscated gears or to simply not confiscate them from illegal gear-users. Sometimes fishers collect money amongst themselves to redeem their gear from the fisheries officers.

The complexities associated with managing Lake Victoria fisheries are directly related to its status as a common-pool resource; with government as the ultimate owner (SEDAWOG 2000). Government ownership is deduced to mean open access by the local fishers (SEDAWOG 2000). As mentioned earlier, this perception of the lake's resources has led to the tremendous increase in the number of fishers, and consequently, a decrease of the resource, high competition

[4] According to Internal Fisheries Division Reports on Monitoring, Control and Surveillance.

among fishers, theft of fishing gears, increasing use of illegal fishing gears (LVFO 2005). Also conflicts among fishers have increased, for instance related to gear entanglement, especially between gillnets and long lines (Kirema-Mukasa et al. 2005). Gillnetters have used fishing technology where the nets are set and allowed to drift in the lake to collect anything in their path, including long lines. This, in addition to limiting accessibility to the resource for those fishers who use long lines, has also resulted in destruction and loss of gears.

In response to this situation the management system was decentralized in the late 1990s and a co-management regime – the Beach Management Units (BMU) – was introduced to encourage fishers to become involved in the custody of the lake's fisheries resources. They were initiated before a legal framework was established, and they were ill-prepared to undertake the responsibilities assigned to them and to address competing interests among individual BMU members (Onyango 2004; URT 2005). The BMUs were born out of the reality that fishery authorities lacked the resources to effectively implement fisheries regulations. Resource ownership was not intended to be an essential part of the co-management establishment (Onyango 2004); rather, fishers were incorporated by being expected to commit themselves to following regulations, whereby much of what they did became illegal. The manner in which this co-management regime was established did not clearly address the rights issue concerning fish resources; by instead focusing on restrictive fishing regulations, the regime was vulnerable to internal dissension, as, for example, fishers publically criticized BMU leaders. Given that fishers were already facing hardships which they believed fisheries regulations had not resolved, they perceived the BMU to be irrelevant and found ways to work illegally.

Summary: Lake Victoria fisheries resources represent a considerable wealth that has given rise to a lucrative export oriented industry. However, benefits have not trickled down to communities; people are still undernourished and deprived of basic entitlements like healthcare, education, transportation, electricity and other community infrastructure. The opportunities of a free-for-all fishery commons to support small-scale fisheries and communities are weakened by lack of financial support, unregulated and illegal fishing, dwindling resources, asymmetric relationships of exchange, and ineffective organization. Thus, there is a parallel to Sen's observation pertaining to famine. It is not shortage of food *per se* that makes people undernourished, but the lack of secure access to food that is the problem. The latter is basically about the entitlements and capabilities that determine "the relationship of persons to the commodities" (Sen 1991, 1).

4. Discussion

According to Garrett Hardin, poverty results when resource users are pursuing their freedom in the commons. In Sen's judgment, poverty results from a deprivation of entitlements and capabilities that limit poor people's freedom to improve their lot. Hardin regards poverty as an outcome of overexploitation,

whereas Sen has something to teach us about what its causes are in a broader sense. Small-scale fishers are not always among the "the poorest of the poor" (Cf. Béné 2003; Garaway 2005; Thorpe et al. 2007; Béné et al. 2009). However, if we are to believe Garrett Hardin (and Scott Gordon), small-scale fishers are destined to become so. The WorldFish Centre and The Food and Agriculture Organization of the United Nations (FAO 2005) estimate that 23 million out of 150 million people in households that depend primarily on small-scale fisheries are living on the equivalent of one US$ a day or less. Hardin provides a recipe for how to avoid such a tragic outcome, which is limiting the freedom that fishers are enjoying in the commons. Sen's solution to the poverty problem goes in the opposite direction; that is to enhance their freedom, their freedom as agents in their own lives which depends on access to entitlements and capabilities.

The causes of resource degradation and poverty among small-scale fishers are no doubt complex. Malthusian overfishing may be one reason, as Hardin would predict. Poverty may well be a consequence, but it may also be a cause of overfishing, as when people in the Tanzania and Bangladesh case studies are forced to abandon other occupations and livelihoods to enter the fishery commons. But as demonstrated in both situations, the poverty of small-scale fishers typically involves a number of capability and entitlement deprivations that limit their freedom to improve their lives, including escaping the destiny that Hardin holds up for them. Therefore, as stressed by many of those who study small-scale fisheries, a richer model for defining, explaining, and dealing with poverty among small-scale fishers is called for (for example Macfadyen and Corocoran 2002; Béné 2003; Smith et al. 2005; FAO 2006; Thorpe et al. 2007; Béné and Friend 2009).

Since poverty can be both a cause and a consequence of overfishing, poverty alleviation strategies and policies would need to work at both ends. Limiting the freedom in the commons according to Hardin – by restricting and even commodifying access or by imposing strict rules – without supplying the entitlements and capabilities that Sen is talking about, can only make poor small-scale fishers even poorer (Stobutzki et al. 2006). These entitlements and capabilities include a bundle of essentials, such as education, healthcare, sanitation, electricity, communication, transportation, credit, and alternative and supplementary livelihood activities that would strengthen the income base and food security of small-scale fishers and reduce their vulnerability (Béné and Friend 2009; Kraan 2009). Resource management and community development in the broadest sense (which to Sen involve "expansion of capabilities") must therefore go hand-in-hand in an integrated fashion (Bailey and Jentoft 1990), and would also have to include investments outside of the fisheries sector (Béné and Friend 2009).

It should be emphasized that raising peoples' income is not the only thing that counts. As Sen (1983, 756) argues, "…when it comes to health, or education, or social equality, or self-respect, or freedom from social harassment, income is miles off the target." Neither would increase in catch necessarily provide any secure supply of such entitlements, as stressed in an FAO report: "Poverty in fishery dependent communities … is not solely related to the abundance of the catch, market

opportunities or the state of the resource. It is also critically dependent on how the benefits from the use of fishery and other resources are used and whether a range of basic services (e.g. in health and education) are provided" (FAO 2006, XIV).

In this article, we argue that a broader concept of freedom is needed than the kind of "freedom in a commons" that Garrett Hardin discussed. First of all, as demonstrated in the two case studies, in real life that freedom appears to be often more fictitious than real as it depends on entitlements and capabilities that are often not available to poor small-scale fishers. Besides, fishers whose only available option for survival is to continue fishing regardless of the state of the resource can hardly be said to be free. The freedom that follows from the entitlements and capabilities that Amartya Sen talks about – and which the small-scale fishers in the two regions clearly would benefit from – is not what will ruin the commons. Rather, Sen's idea of freedom contains the conditions that would help them break out of the vicious circle of poverty they find themselves in. Quoting Marx, Sen says that his concept has to do with "replacing the domination of circumstances and change over individuals by the domination of individuals over chance and circumstances" (Sen 1983, 754).

Sen (2000) emphasizes "the complementarity that exists between individual agency and social arrangements," such as institutions, and that it "is important to give simultaneous recognition to the centrality of individual freedom *and* to the force of social influences on the extent and reach of individual freedom" (Sen 1999, xii). For the poor, these influences may break both ways: they may suppress freedom, as is sometimes the case with traditional authorities in Africa and elsewhere (Jentoft 2004), but they may also be potentially empowering and therefore liberating, as Kraan (2009) describes in the case of small-scale fisheries in Ghana, and Menezes et al. (2009) for Mozambique. Notably, institutions that help people to deal with their individual and collective challenges are enhancing freedom even if they restrict individual choice, as resource management systems always do – or what in fact it means to be living in a community (Baumann 2001). The individual gain of mutual commitment outweighs individual sacrifice. A healthy ecosystem is also in the interest of small-scale fishers even if it may require limiting their freedom in the commons. But that sacrifice would be easier to bear if people had a broader set of entitlements and the capabilities to take advantage of the opportunities they have.

The case-study presentations are organized around Sen's constitutive elements of freedom: a) eco-system characteristics and pressure, b) livelihood opportunities and capabilities, and c) institutional mechanisms and entitlements. As to the first element, they both emphasize the contribution of small-scale fisheries to food security and nutrition. Small-scale fishers are, however, vulnerable to the vagaries of nature, which as in the case of Bangladesh expose them to heavy risks. Sometimes they experience eco-system damage that reduces the diversity of the resource base, as with the Nile Perch in Lake Victoria. When small-scale fishers encounter a loss of income for these or other reasons, they take advantage of their

de jure "opportunity freedom" (Sen 1999, 17) of the commons by increasing or changing their fishing effort, in many instances by breaking the law. In the case of Lake Victoria, they do this by adopting illegal gear, such as small meshed gillnets, driftnets and beach seines, or they diversify by exploiting species that are threatened and sometimes protected like juvenile shrimp, shark or lobster, and coral extraction in Bangladesh. Another coping strategy is to extend the fishing period, which sometimes means taking greater risks during dangerous weather conditions as fishers in Bangladesh are forced to do.

The second constitutive element of small-scale fishers' freedom pertains to livelihood opportunities and capabilities. In both regions described in this article, fisheries are by law open access and experiencing increases in fishing effort, partly due to more effective gear being adopted and because of an influx of newcomers from other sectors and regions. Newcomers are, however, often met with resistance by locals who experience that their fishing grounds are invaded and that their rules of tenure are not respected, as in Bangladesh. In neither case do we see people leave the fishery. Once they are in they stay. When alternative sources of livelihood do exist, small-scale fishers lack the entitlements and capabilities that would make them accessible. In Bangladesh credit for small-scale fishers is hard to obtain outside the informal *dadon* system, mobility and transportation is difficult, and illiteracy is widespread. Among small-scale fishers in Lake Victoria, education is often undervalued, whereas in the case of Bangladesh it is considered a luxury poor fishers feel that they cannot afford.

As is often the situation in small-scale fisheries globally, fishers are the weaker party in asymmetrical exchange relations, notably the *dadon* system in Bangladesh and its equivalent fish agents in Lake Victoria. Unions and cooperatives that could liberate small-scale fishers from the bond with the middleman/moneylender are non-existent. In the two situations, small-scale fishers have experienced that when they tried to liberate themselves from the middleman, they are punished with lower prices or harsher demands. Such relationships exemplify the "unfreedoms" that leave people with no ability to exercise "their reasoned agency." Removing these "unfreedoms" is therefore "constitutive of development" (Sen 1999, xii – italics in the original).

Fisheries development should therefore begin with Sen's realization that poverty essentially involves relationships to things, to people and to institutions that limit their action space, deny them of basic entitlements, and block them from developing and employing their individual and collective capabilities.[5] As Cleaver (2005) also argues, poor peoples' agency and room of manoeuvre are critically restricted or enabled by their social relationships, whereas Gore emphasizes that entitlement analysis must incorporate "power relationships and discursive

[5] In his most recent book, Sen takes issue with the criticism that he sees capabilities only as an attribute of individuals. He insists that there is "no great difficulty of thinking about capabilities of groups" such as communities (Sen 2009, 244). A number of these criticisms are presented in Comim et al. (2008) and Gore (1993).

practices", including those that are non-state, informal and local (Gore 1993, 452). The relationship that small-scale fishers have with their money lenders in these two case studies are clearly of this nature.

In addition to opportunity freedom, Sen also stresses the importance of what he calls "process freedom" (Sen 1999, 17). The latter is about decision-making, democracy, participation, and transparency (Sen 1999, 127). Lake Victoria stands out with its Beach Management Units (BMUs). Although they may be criticized for not fully delivering on Sen's criteria, or in some instance even working against them, they exemplify the social arrangements that could empower small-scale fishers and thus are in line with his views on development as freedom. Therefore, they represent a form of institutional arrangement at the local level that would be relevant also in the context of Bangladesh. When such arrangements do not work effectively in uplifting the poor while sustaining the resource, the remedy should be to try to fix them rather than to abandon them.

In both Bangladesh and Tanzania, the government is unable or unwilling to provide the "protective security" that Sen discusses and which the philosopher Isaiah Berlin (1969) called "negative freedom."[6] In Bangladesh, small-scale fishers experience assaults on the fishing grounds, theft of fishing gear, or invasion of the fishing grounds that are reserved for them. In both places, fishers and fisher women experience being cheated by middlemen and harassment by public officials. They also experience pressure from newcomers into their fishing grounds by people who disrespect their tenure (the *Pata* hereditary system) or by industrial vessels who do not recognize the zone that have been allotted to small-scale fisheries. In both instances government backup is missing.

5. Conclusion

According to Kooiman et al. (2005), fisheries governance is as much about creating opportunities as it is about problem solving. Governance would therefore aim to provide small-scale fishers with a broader set of opportunities, entitlements and capabilities than they currently have. Allison and Horemans (2006, 764) argue along the same line:

> "It is the policies and institutions that determine access to assets, set the vulnerability context and determine people's livelihood options, reactions and strategies, and ultimately the outcomes of those strategies in terms of their ability to make a living and willingness to invest in helping to conserve the natural resource base. Addressing governance therefore remains the key challenge for both poverty reduction and responsible fisheries."

[6] For Berlin "negative freedom" is freedom *from* hunger, exploitation and suppression whereas "positive freedom" is freedom *to* realize one's potentials and opportunities.

The Bangladesh and Tanzania studies show how catastrophes such as hurricanes, floods or drought can destroy essential livelihood entitlements for small-scale fishers. They also demonstrate how small-scale fishers become victims of social and institutional forces, which are difficult to change from the bottom-up because they require the sort of entitlements and capabilities that small-scale fishers typically do not have. The two case studies suggest that poverty alleviation and resource management requires a governance approach that covers the full range of entitlements that Sen is talking about. Poverty alleviation and resource management are also about building capability at individual, household, community and government levels.

As demonstrated in both Bangladesh and Tanzania, a fishery commons in danger of collapsing due to overuse and ecologically destructive fishing practices would obviously require urgent measures, but limiting the "opportunity freedom" of small-scale fishers "locked in the logic of the commons" (Hardin 1968, 1248) is not the only thing that needs to be done. It may not even be a solution that would bring the most sustainable outcome. Rather, it would require a more comprehensive governance reform, a reform that would promote freedom both in a negative and positive sense (Berlin 1969; see also Sen 1989). Inspired by Amartya Sen, we have in this article questioned the very idea of what constitutes freedom in a fishery commons and argued that deeper reflection is needed than what it typically receives among policy makers, managers and academics who are inspired by Garrett Hardin. Rather than defining the tragedy of the commons as a market failure, it should be seen as an entitlement and a capability failure, similar to how Sen (1981) explains famine. It is somewhat ironic that Hardin is commonly perceived as having provided a simple, but elegant technical solution to the tragedy of the commons, i.e. limiting the freedom of resource users, yet his main argument is that this problem does not have a technical, scientific solution but one that would require "a change in human values or ideas of morality" (Hardin 1968, 1143). Limiting the freedom of small-scale fishers is obviously an issue of justice, particularly when poverty is the cause or outcome. (Justice is also a recurring theme in Sen's work, including in his 2009 book.) But Hardin can hardly be held responsible for what his followers have done when putting his ideas into regulatory policy and practice. We believe, however, that as far as small-scale fishers are concerned, these policies, practices, and therefore outcomes, would have been very different from what they are today if it had been Sen's, rather than Hardin's idea of freedom that was at their roots.

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