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Bans, tests, and alchemy: Food safety regulation and the Uganda fish export industry

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Abstract. Contemporary regulation of food safety incorporates principles of quality management and systemic performance objectives that used to characterize private standards. Conversely, private standards are covering ground that used to be the realm of regulation. The nature of the two is becoming increasingly indistinguishable. The case study of the Ugandan fish export industry highlights how management methods borrowed from private standards can be applied to public regulation to achieve seemingly conflicting objectives. In the late 1990s, the EU imposed repeated bans on fish imported from Uganda on the basis of food safety concerns. However, the EU did not provide scientific proof that the fish were actually "unsafe." Rather, the poor performance of Uganda's regulatory and monitoring "system" was used as justification. Only by fixing "the system" (of regulations and inspections) and performing the ritual of laboratory testing for all consignments for export to the EU did the Ugandan industry regain its status as a "safe" source of fish. Yet, gaps and inconsistencies abound in the current Ugandan fish safety management system. Some operations are by necessity carried out as "rituals of verification." Given the importance of microbiological tests and laboratories in the compliance system, "alchemic rituals" provide an appropriate metaphor. These rituals are part and parcel of a model that reassures the EU fish-eating public that all is under control in Uganda from boat to point of export. As a consequence, actual non-compliance from boat to landing site allows the fishery to survive as an artisanal operation.

Key words: Agrifood systems, European Union, Fish export, Food safety, Rituals of verification, Standards, Uganda, Value chains

Abbreviations: DFR – Department for Fisheries Resources; EU – European Union; FIRRI – Fishery Resources Research Institute; GHP – Good Hygiene Practice; GMP – Good Manufacturing Practice; HACCP – Hazard Analysis and Critical Control Point; ISO – International Standards Organization; MAAIF – Ministry of Agriculture, Animal Industry and Fisheries; UFPEA – Uganda Fish Processors and Exporters Association; UNBS – Uganda National Bureau of Standards; UNIDO – United Nations Industrial Development Organization; WTO – World Trade Organization

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> ***alchemy:*** *ancient art of obscure origin that sought to transform base metals (e.g., lead) into silver and gold; forerunner of the science of chemistry … [alchemy] was influenced by the philosophy of the Hellenistic Greeks; the conversion of base metals into gold (considered the most perfect of metals) was part of a general striving of all things toward perfection. Since the early alchemists were mainly artisans, they tried to conceal the secrets of their work; thus, many of the materials they used were referred to by obscure or astrological names. It is believed that the concept of the philosopher's stone (called also by many other names, including the elixir and the grand magistery) may have originated in Alexandria; this was an imaginary substance thought to be capable of transmuting the less noble metals into gold and also of restoring youth to the aged (The Columbia Electronic Encyclopedia, 2001).*

> *Alchemy is a complex subject with many different interconnected aspects. Many people still only think of the quest of the philosophers' stone to change base metals into gold … [Some] alchemical texts are wonderful works of allegorical literature, delve into its amazing, beautiful and enigmatic symbolism, and ponder its underlying hermetic philosophy, which*

holds a picture of the interconnection of the Macrocosm and Microcosm. (The Alchemy Website, 2005).

Introduction

When Uganda's fish export industry started to operate in the late 1980s and early 1990s, fish from Lake Victoria began turning into gold. From an export value of just over US$1 million in 1990, the mighty Nile perch had earned the country over US$45 million just six years later. But alchemy proved to be more than the quest of the philosophers' stone to change base metals into gold. From 1997 to 2000, the industry experienced EU import bans that were justified on the basis of allegorical meanings of the notion of "fish safety." All of a sudden, the "Macrocosm" of consumer protection and the "Microcosm" of fishers and fish processing plant workers' practices and lives became strongly interconnected. Despite claims to the contrary, the European Union (EU) did not provide scientific proof that fish was actually "unsafe." Rather, the poor performance of Uganda's regulatory and monitoring "system" was used as a justification. The "system" within this allegory has no individual personality and is the embodiment of the moral qualities that "the consumer" expects from "responsible operators" in the fish sector.

Only by fixing the system of regulations and inspections and performing the ritual of laboratory testing for all export consignments did the Ugandan industry regain its status as a "safe" source of fish. This was achieved through the joint effort of the department in charge of fish safety (Uganda's Department of Fisheries Resources, DFR) and the local processing industry. Such a level of private-public collaboration is seldom seen in East Africa. The now "well-functioning" system should be sufficient to minimize the risk of food safety failure, but product testing is still carried out – just in case. Yet, important parts of "system" exist only on paper. The white coat and advanced machinery of present-day alchemists reassure insecure European regulators and consumers. In Uganda, fish can be turned into gold again – but for how long?

This article analyzes the structure and transformation of the Nile perch export industry in Uganda in the context of tightening food safety standards for fisheries and other EU agro-food imports. Uganda's Department of Fisheries Resources has worked very closely with processors to regain access to the EU market during the export bans of the late 1990s. Along the way, it has developed a much more open attitude towards the commercial interests of the industry. Therefore, "private" standards for quality, safety, size, volume, and logistics indirectly filter through the regulatory system.[1] This filtering process takes place through direct industry pressure on regulators, but also through an indirect building of shared commercial and political interests between industry and regulators. Only by working together can the two players promote their shared interest in creating a "success story" of the fish export industry.

In practice, this means that the regulatory authority in Uganda seeks to reconcile objectives that are often in conflict with each other. First, it needs to facilitate efficient logistics **and** food safety. Thus, in order to move fish quickly, consignments are air-freighted to Europe before the results of some product tests are available. Although a recall system is in place, consignments are almost never seized and destroyed. Instead, problems are solved contractually among the parties – usually with a price discount. Second, the authority is asked to facilitate market demand **and** to preserve the resource. The former requires exporting as much fish as possible in the form of small fillet size. It entails marketing products made from juvenile fish, thus endangering the long-term sustainability of fish stock. The latter requires regulating the industry to achieve a "sustainable" rate of extraction. It entails a ban on trading juvenile fish. All this needs to be achieved in an environment of very limited information on stocks and eco-system dynamics. These schizophrenic exercises and compliance systems mean that at least some food safety-related operations are by necessity carried out as "rituals of verification," as Power (1997) would have it. Given the importance of microbiological tests and laboratories in the food safety compliance system, "alchemic rituals" provide an appropriate metaphor. This is unlikely to be a peculiar trait of Uganda's food safety compliance system or of African countries more generally. A number of Ugandan and South African fish industry players, who often visit fishing and processing operators in Europe, have argued in interviews that European systems fall in the same mold.[2]

The next section briefly examines the ongoing debate over the role of standards in agro-food value chains, and how standards, including food safety regulation, shape inclusion and exclusion barriers for developing country actors. It also highlights how regulation has progressively absorbed some management and monitoring systems that characterize private standards and, conversely, how private standards are covering areas that were originally the domain of regulation. Particular attention is paid to the performative/ritualistic aspects of standard management and to the importance of document trails. Section three provides a profile of fisheries on the Ugandan side of Lake Victoria, including key resource and trade indicators and configurations of actors, operations, and regulations. Section four analyzes the current transformation of fish safety management and industry operations in Uganda as a result of the enforcement of EU regulations and the related import bans that took place in the late 1990s. The final section highlights gaps and inconsistencies in the Ugandan fish safety system. This is not done in a prescriptive way, but in view of specifying how rituals of verification, a combination of document management systems and laboratory tests, are part and parcel of a model that reassures EU consumers and regulators and that, at the same time, maintains the political objective of an artisanal-based fishery on Lake Victoria.

Methodology

This article is based on fieldwork carried out by the author in 2004 in Uganda. All information presented here is based on interviews with key informants unless otherwise stated. Interviews were carried out with government officials, logistics and cold storage providers, locally-based fish importers, quality assurance consultants, trainers and certifiers, and laboratory operators (for a total of 32 interviews). Additionally, interviews were carried out with the owners and/or plant managers and quality control managers of all nine companies that operate a total of 15 fish processing plants in the country. Secondary material was collected at various government departments and at the library of the Fishery Resources Research Institute (FIRRI). In order to maintain confidentiality, the identity of persons and companies covered during fieldwork has been concealed.

Standards and food safety: The debate

"Standards are agreed criteria ... by which a product or a service's performance, its technical and physical characteristics, and/or the process and conditions, under which it has been produced or delivered, can be assessed" (Nadvi and Wältring, 2002: 6). Standards are important for developing country farms and firms because they determine the mechanisms of participation in specific global value chains and shape market access to specific countries (cf. Daviron and Ponte, 2005; Gibbon and Ponte, 2005; Giovannucci and Ponte, 2005; Nadvi and Wältring; 2002; Wilson and Abiola, 2003). On the one hand, standards set entry barriers to new participants to a value chain and raise new challenges to existing developing country suppliers. On the other hand, the challenge of rising standards may provide the opportunity for selected suppliers to add value, assimilate new functions, improve their products, and even spur new or enhanced forms of cooperation among actors in a specific industry or country (Jaffee and Henson, 2004; Jaffee and Masakure, 2005).

Most economic analyses of food safety still assume that there are "objective" notions of safety, risk, and hazard. In reality, these notions vary dramatically between individuals, and across time, countries, and cultures (Freidberg, 2004; Gibbon and Ponte, 2005). The way food safety is "measured" varies depending on what convention is used to set accepted reference values and measurement methods (Ponte and Gibbon, 2005). Food is not only commerce but also a cultural statement, and food safety regulation can bring the two into conflict (Echols, 2001). With the advent of the World Trade Organization (WTO) and its Agreement on Sanitary and Phytosanitary Measures, food safety measures can no longer be based on local perceptions of what is safe. Food safety in this framework is based on "scientific principles" and on risk assessment. It is cast "neutrally in the perceived certainty of chemistry, biology and applied economics" (Echols, 2001: 4). Yet, different perceptions of safety, risk, and hazard remain and are embodied in regulation. The EU, for example, still applies the precautionary principle in ensuring food safety and rejects genetically-modified organisms as "unsafe." While the Codex Alimentarius standards play the benchmark role for national regulation, their claim to "universality" is based on specific ways of measuring damage and assessing risks and on specific choices of indicators and minimum thresholds. It is an open secret that developed countries have scientific and political clout in the Codex, thus determining what is "safe food."

At a time when the literature on agro-food systems and value chains is paying increasing attention to private standards as key mechanisms of governance (Bingen and Siyengo, 2002; Busch and Bain, 2004, Henson and Reardon, 2005; Konefal, Mascarenhas and Hatanaka, 2005; Reardon et al., 2001; Ponte and Gibbon, 2005),[3] this article goes "back to the basics" by reflecting upon the new configurations that regulatory standards on food safety have taken in the last decade or so. The purpose of this choice is to highlight how elements of quality management and of systemic performance evaluation methods that pervade private standards (cf. Hooker and Caswell, 1999b) are percolating into the realm of regulatory standards as well. In 2004, the EU enacted a highly complex and comprehensive set of regulations on food safety, the so-called "hygiene package," which went into force in 2006.

. This package covers all food industry-related actors, with some exceptions, and is designed to reassure anxious European consumers that risk minimization and food safety maximization systems are in place. The same strict rules are applied to establishments outside of the EU if they want to qualify for export, thus extending the system extra-territorially and signaling that "European" philosophies and techno-scientific methods are applied in developing countries as well. European consumers, politicians, and regulators can apparently rest in peace.

A large amount of literature has been dedicated to analyzing the actual, potential, and imagined protectionist effects of food safety regulation and to measure the costs and benefits of compliance (cf. Mehta and George, 2005; Otsuki et al., 2001; Unnevehr, 2000; Wilson and Abiola, 2003). The common argument in this context is that developing countries are "standard takers" and that they lack resources and technical capabilities to use the dispute settlement and arbitration mechanisms available at the WTO. These mechanisms are supposed to redress food safety standards that are discriminatory and negatively affect imports. It has also been argued that, when compliance costs are high, standards may result in reduced imports to the benefit of domestic producers (Henson and Loader, 2001; Hooker and Caswell, 1999a). In particular, food safety measures are said to be a major factor limiting developing countries' exports of agricultural and food products, especially to the EU. On the contrary, other contributions have focused on how food safety standards can provide a launching pad for upgrading in agro-food industries (Jaffee and Henson, 2004; Jaffee and Masakure, 2005). However, the distinction between the two strands of literature is narrowing – in recent years a certain level of convergence has taken place (cf. Henson and Mitullah, 2004; Henson and Reardon, 2005; Jaffee and Makasure, 2005; World Bank, 2005).

As always, the devil is in the details and the actual exclusionary/inclusionary paths induced by food safety regulation and the possible upgrading/downgrading dynamics are often value chain-specific and dependent on regional or even local factors (Gibbon and Ponte, 2005). Analyzing fish exports from a low-income country is particularly helpful at the current historical conjuncture because strict fish safety measures have been in place in the EU regulatory framework since 1991. As a matter of fact, the current "hygiene package" builds upon measures that have been developed in the EU for assuring the safety of animal products since the early 1990s. East African countries, having experienced various EU import bans on fish products in the late-1990s, offer lessons on how "science," laboratories, and risk management systems have been used to ensure food safety through rituals of verification. The case study of Ugandan Nile perch highlights how food safety monitoring systems are as much about avoiding political fallouts from possible food scares as they are about protectionism. Europe can supply less than 50% of the fish sold in its markets from its own waters. It has been hunting for new sources of "groundfish" (a generic term including white-meat fish species such as cod, hake, and perch) across the world, both through the use of its distant-water fleets and via increased imports (Ponte et al., 2007). Protectionist elements in EU policy remain, especially in defense of its fish processing industry, the utilization of its vessels and the employment of crews. However, these elements rarely apply to imports of unprocessed fish. From this point of view, a ban on imports of Nile perch from Lake Victoria can not easily be attributed to protectionist motives, although these may be at play in other cases.

In this article, rather than seeking a grand answer to the general question of motivations behind food safety regulation and the impact of regulation on low-income countries, a more focused analysis is provided. This analysis looks beyond what regulation and implementation systems appear on paper and also beyond the actual transformations and expenses that industry operators have had to undertake to comply with standards. Emphasis is placed on the performance aspect of both regulatory systems and of compliance – food safety systems are there to assure consumers that measures based on the most advanced managerial and scientific methods are in place to safeguard their health. Essential parts of this apparatus are laboratory testing, mandatory inspection at the export level, risk management based on Hazard Analysis and Critical Control Point (HACCP) systems, and a high level of supervision by the EU over "competent authorities" in developing countries – at least in theory. If one scratches the surface, however, it becomes clear that parts of the system are fictitious. For example, all fish are supposed to be landed in "registered," thus sanitarily upgraded, sites in Uganda – but this is not the case in practice. The "real" system of compliance, however, is not based on idiosyncratic cultural phenomena, such as "African culture" or "Ugandan culture." Rather, it is embedded in an "audit culture" that requires rituals of verification (Strathern, 2000).

Uganda fisheries on Lake Victoria: A profile

Uganda's open water bodies cover about 45,313 km^2 of the nation's total surface area of 241,551 km^2 (UBoS, 2003). Its major lakes are Victoria, Kyoga, and Albert. Lake Victoria is shared by Kenya (6% by area), Tanzania (51%) and Uganda (43%). Lake Victoria is estimated to contribute about half of the national fish catch in Uganda. Catches on lakes Kyoga, Victoria, and Albert cumulatively comprise 95% of the national catch**.** The major commercial species caught in these lakes are Nile perch (*Lates niloticus*), tilapia (*Oreochromis niloticus*), and "mukene" (*Rastreneobola argentea*)*.* Average annual catch of all fish from all lakes in Uganda is estimated to be in the range of 220,000 tons. The largest recorded catch on Lake Victoria was 136,000 tons in 2002, five times the estimated catches of the early 1960s. According to Bahiigwa and Keizire (2003), in the 1990s and early 2000s, Nile perch catches have dominated Ugandan fisheries – representing 60% of total recorded catches.

Nile perch was introduced into Lake Victoria from Lake Albert in the 1950s. It can grow to over 50 Kg of weight. It is a predator that feeds on other fish, and the idea behind its introduction in the lake was to "convert" small haplochromine species into a more commercially exploitable fish (Graham, 1929 as quoted in Ogutu-Ohwayo, 1999). Stocks of Nile perch started to increase rapidly from the early 1980s, followed by an increase in catches and the reduction/disappearance of many native species (Ogutu-Ohwayo, 1999).

Figure 1 summarizes the main characteristics and operations of the Uganda Nile perch value chain. At the catch level, operations are of an artisanal nature. Thousands of wooden boats catch fish using low-cost methods such as gill-netting, long-lining, trolling, and mosquito-seining. Nile perch is usually fished with gill nets and long lines. The Ugandan government (along with Tanzanian and Kenyan counterparts) has banned trawling on the lake since 1995 to limit its adverse environmental and stock impacts (Mbuga et al., 1998) and to actively preserve the artisanal nature of the fishery. According to the Lake Victoria Frame Survey of 2000, there are around 35,000 crew members operating about 15,500 boats in Lake Victoria. Around 12,800 of these boats are manually operated; 2,000 are powered by out-board engines (either owned or rented), and over 650 are sail powered (MAAIF, 2001). There are also an estimated 910 transport boats on the lake. Nile perch fishing, while still artisanal in the sense that small boats are used, is moving towards more commercial operations. There are still many single-boat operators on the lake in Uganda, but local researchers estimate that the number of larger scale operations run by absentee owners and supervisors is increasing, following a system that is well-established in Tanzania (Gibbon, 1997). Motorized boat owners/supervisors usually employ operators who receive 30–40% of the value of fish, either before of after deducting the cost of fuel. The owner maintains boats, engines, and nets.

FIGURE 1 HERE

In Nile perch fishing, nets are usually set in the evening and hauled out in the morning. As a result, the freshness of fish at landing will vary depending on when it was caught as spoilage begins soon after death. Fishing grounds are typically 2–4 hours away from island-based transit/landing sites by motorboat. Fishing boats do not carry ice as they are often too small to accommodate it. Fish are placed at the bottom of the boat, sometimes covered with a plastic sheet or vegetation. As a result of sun and temperature exposure, fish lose shelf-life quickly. Cleaning of boats is not a daily practice and, when it is done, contaminated water from the lake is used. The first time fish are placed on ice is only on the collector boat (open-planked canoes powered by outboard engines) or in vats placed at the transit sites. These collector boats deliver fish to the mainland landing sites and come back loaded with ice supplies. Collector boats typically stay 2–3 days around the island sites before coming back to the mainland. If no ice is available, they purchase fish in the early morning from fishers and transport it to the mainland during the same day (NARO, 2001).

There are an estimated 600 landing sites on Lake Victoria in Uganda, of which about 30% can be accessed by vehicles (MAAIF, 2001). In 2004, only 14 landing sites had been upgraded and officially approved by the competent authority to handle fish for export (for a comparison among types of landing sites, see FIRRI, 2003b). Because of the low number of approved sites, processors, agents, and traders have to buy fish from non-approved sites as well. How they obtain the mandatory local health certificate for the volumes bought at non-approved sites is a matter of speculation. Key informants have suggested that they trans-ship from a non-approved to an approved site and/or obtain a certificate even though the fish have not physically transited through an approved landing site.[4]

The fish export industry in Uganda is relatively new. In the 1980s, exports were of a regional nature. Much of the fish processing that was taking place on Lake Victoria was based in Kisumu, Kenya. The Kenyan plants were sending insulated trucks with ice to landing sites in Uganda to collect the raw material. By 1989, some plants had been built in Uganda as well. In 1991, the Ugandan government placed a ban on the export of unprocessed fish, thus further stimulating investment in local processing capacity (Ogutu-Ohwayo, 1999). The first recorded exports to Europe and the Far East took place as recently as the late 1980s (NRI and IITA, 2002). In these early days, Nile perch was exported in fillet form and sometimes as headed and gutted fish – all blast frozen. Hygiene certificates were needed for export, but the product and the processing plants were never really monitored (Ibid.). In 1992, fish was first exported chilled on ice to the EU (cf. Nyombi and Bolwig, 2004; Thorpe and Bennett, 2004). Increased market demand for Nile perch in the last 15 years has been partly created by declining stocks of cod and haddock in Northern hemisphere waters. Although Nile perch is a fresh water fish, it competes directly with other species in the market for so-called "groundfish" of neutral flavor. Salmon also has become a direct competitor of Nile perch following the dramatic increase in farmed salmon production and concurrent decrease in its price (Anderson, 2003).

As we can see from Table 1, total fish exports skyrocketed between 1990 and the early 2000s in volume and value terms.[5] In 1990, there were 1,664 tons of recorded exports for a value of

US$1.4 million. Between 2001 and 2003, exports peaked at over 25,000 tons for a value of almost US$88 million.[6] In comparison, the country's main traditional export crop (coffee) generated foreign exchange of US$100 million in 2003. The main exported product forms of Nile perch are chilled and frozen fillets. Two plants have dedicated "value-added" lines, manufacturing fish fingers, cakes, burgers, and other products. The volumes handled so far are small. Since 2001, fish exports as a proportion of total exports from the country by value, have been in the range of 17–18% versus 19–22% for coffee. In 2003, about two-thirds of fish exports went to the EU. The two species exported outside the region are Nile perch and small quantities of tilapia.

TABLE 1 HERE

TABLE 2 HERE

Table 2 provides specific information on exports of Nile perch fillets from Kenya, Tanzania and Uganda to the EU, based on EUROSTAT import data. According this table, Nile perch fillet exports from the three East African countries to the EU suffered from the import bans of the late 1990s (and especially 1999). From 2001 onward, however, they have recovered and stabilized at around 39,000–45,000 tons, almost twice the volume level of 1997. In 2004, they shot up to 56,000 tons. The composition of exports by type of product, however, has changed dramatically. Fresh fillet exports by volume have increased from 58% of the total in 1997 to 80% in 2003. By value, they changed from 67% to 83%. Correspondingly, frozen fillet exports have decreased, both proportionally and in absolute terms.

The regional composition of exports by volume has also changed dramatically. In 1997, the three countries each exported approximately one third of their total exports from Lake Victoria. By 2004, Tanzania was exporting 55%, Uganda around 33% and Kenya around 12%. Tanzania was the first country to comply with EU food safety standards and thus the first to recover from the ban in 2000, followed by Uganda in 2001. Kenya has not been able to regain the position it held in 1997 in terms of volume of exports. This is due to a slower reaction to the EU bans, stricter enforcement against cross-country trans-shipments of fish in Uganda and Tanzania, and increased competition from new processing plants in the other two countries. Competition from Vietnamese *basa* in the EU has affected import unit prices for Nile Perch from the region, which fell from €4.9/Kg of fillet to €3.4/Kg between 2002 and 2004 (see Table 2). As a result, to gain approximately the same value of exports in 2004, as in 2002 the three countries had to export an extra 17,000 tons of fillets.

Industrial processing was introduced in Uganda in the 1950s, but the initial industrial fish processors collapsed in the 1970s due to the political and economic crises that hit the country. The 15 industrial plants currently in operation were established starting in the late 1980s. Processing companies usually purchase fish from public landing sites. Some also operate their own landing sites, sometimes shared with other processors. A few have processing plants directly on the shore and operate a landing site at the factory. Nile perch fillets are exported either chill packed on ice in polystyrene boxes, or frozen packed in carton boxes and stacked in temperature controlled containers. Each consignment has to be accompanied by an export health certificate released by the Department of Fisheries Resources, showing that the consignment meets the sanitary standards set in regulation. Up to the mid-1990s, before the EU fish import bans, samples for analysis had to be sent from Uganda to Europe for laboratory testing. In 1999, a Belgian-based company that had been involved in providing testing services for the Ugandan fish industry established a laboratory in Kampala. A second laboratory was equipped for carrying out microbiology testing but not pesticide residue analysis (for details of specific tests, see below). This was established with support from the United Nations Industrial Development Organization (UNIDO) and is run by the Uganda National Bureau of Standards (UNBS).

Only about 10 importers handle the bulk of Nile perch imports from East Africa, five of them are the main players. Two of these have operations on the ground in Uganda, and their main business locally is to coordinate logistics and either sell cargo space or buy fish on their own behalf to fill cargo space. Once fish consignments are cleared at the import point in Europe, they are transported to the importer's cold storage facilities. From there, they are normally trucked to other destinations in Europe. Importers sell in bulk to fish processors (if further processing and/or packaging are needed), to distributors/wholesalers, or directly to supermarket chains. Distributors/wholesalers, for their part, supply fish shops, fish auctions, local fish markets, catering businesses, restaurants, and supermarket chains.

Fish safety standards: Uganda before and after the EU import bans

The Department for Fisheries Resources (DFR) within the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) is the sole competent authority for the inspection and certification of fish and fisheries products destined for export. The "Fish (Quality Assurance) Rules of 1998" regulate inspections in detail and the approval of establishments and official landing sites. They also prescribe the application of HACCP systems, good hygiene and manufacturing practices, conditions for storage, transport, and packaging, and set modalities for issuing sanitary certificates for export.

The central offices of DFR are staffed with 17 inspectors who monitor the overall system and operations at processing plants. Another 20 or so inspectors operate at the 14 landing sites that are officially approved to handle fish for export. These inspectors issue the local fish health inspection certificates that are needed to move fish from a landing site to a processing factory. On paper, the landing site inspectors are supposed to check all incoming consignments of fish. Local inspection normally consists of a sensory analysis of fish freshness. Samples may be taken for further laboratory tests if the need arises and the batch of fish may be impounded. In addition to product testing, fish inspectors are supposed to fill out an inspection checklist for upstream operations. This checklist includes inspections of vessels on the lake, procedures carried out at fish landing, appropriate handling for transportation, and landing site infrastructure. These aspects do not appear to be routinely monitored, especially on the lake.

Monitoring of quality assurance systems at the processing level is based on a combination of scheduled and unscheduled visits by inspectors based at the central offices of DFR. Once a year, an inspection is carried out in each processing plant for renewal of their licenses. This includes an evaluation of conformity to the general requirements set by regulation for fish processing plants (MAAIF, 2000). Once a month, routine inspections are supposed to evaluate traceability, the balance of fish input and output at production and export levels, and conformity to general hygiene and handling practice requirements. Fish inspectors have the responsibility of ensuring that HACCP programs applied by the processors are properly designed and implemented.

Product testing for the presence of heavy metals (including mercury and lead) and analysis of Total Volatile Bases (TVBN) are carried out twice a year. For each export consignment, official inspectors are supposed to take fish samples and submit them for sensory, microbiological (total plate count, total Coliforms, *E. coli, Salmonella, S. aureus*) and pesticide residue analysis to one of two local laboratories that have accreditation credentials recognized by the EU. Health certificates are awarded to export batches that pass specific tests in accordance to the EU fish quality directives. For frozen exports, health certificates are issued and consignments are shipped following the availability of these results. For fresh exports, consignments are air-freighted before the results of microbiological analysis are known. Waiting for microbiological results would affect the remaining shelf-life of fish as it takes five days for these tests to be completed (pesticide residue results can be ready in one day). Therefore, fish arrive in Europe before their "safety" has been ascertained. A recall procedure is in place but rarely if ever used.[7] There are currently no standards or operating procedures for fish destined to local and regional markets.

All registered processing plants in Uganda are currently HACCP-compliant, and Uganda appears on List I (i.e., countries that can export fishery products to the EU from any establishment approved by the local competent authority).[8] All plants have also been certified according to the ISO 9001:2000 standard for quality management. Responding to explicit and implicit pressure from the EU, the processing industry association, Uganda Fish Processors and Exporters Association (UFPEA), adopted a voluntary code of Good Manufacturing Practice (GMP).

Overall, the fish quality management system currently in place in Uganda is the result of adjustments made in the late 1990s and early 2000s in response to three import bans placed by the EU on Uganda (and Kenya and Tanzania) between 1997 and 2000. In 1991, the EU promulgated EC Regulation 91/493 on the "Production and placing on the market of fishery products for human consumption." This regulation required the introduction of systems of inspection and control to ensure human consumption safety both in EU countries and in countries willing to export to the EU. These measures included compliance with "Good Hygiene Practices" (GHP) and the application of HACCP procedures. In addition, competent authorities in third countries needed to demonstrate adequate control. The EU has now integrated these regulations in the so-called "hygiene package" that went into force in 2006. Its main features are:

(1) third countries need to have health and sanitary regulations that are at least equivalent to the ones required within the EU; (2) they need to have competent authorities that can guarantee effective implementation of the relevant regulations through inspection, monitoring, and sanctioning systems; and (3) business operators need to apply specific sanitary and health practices in catching, handling, processing, and packaging fish and fishery products, and a system of risk management based on HACCP.

In the early days of Nile perch exports, and even after the promulgation of EU regulation on fish safety in 1991, Ugandan processing plants did not have operational HACCP plans in place. In the period preceding the "mad cow disease" scare, the EU was not as strict on enforcing food safety standards, and a phase-in period had been granted to third-countries. There was no organized system of inspections by the competent authority. The first import ban took place in 1997 as a result of reported instances of high bacterial contamination, including *salmonella*, in some Nile perch exports from Lake Victoria to Spain and Italy. The ban was limited to these two countries. The second ban was imposed for seven months in 1997/98 as a result of an outbreak of cholera in the three riparian countries and Mozambique. In this occasion, the EU banned the import of fresh fish and imposed mandatory tests on frozen fish from East Africa. This was eventually lifted because it was not based on scientific evidence, but on the EU claiming that the competent authorities were not applying sufficient measures to control the outbreak of cholera (Waniala 2002: 2). The third and longest ban, from April 1999 to July 2000, was initially a self-imposed export ban. It started in response to local press reports on the death of a Ugandan child from fish poisoning. Poisoning was linked to the alleged practice of fishing by dumping pesticide in the lake. The Uganda competent authority, at that time, the Uganda National Bureau of Standards (UNBS), declared that it could not guarantee the safety of fish exports and pleaded with the EU for time to solve the problem. The EU, however, immediately applied its own import ban and extended it to Kenya and Tanzania as well – even though the allegations were never proven (cf. Rudaheranwa et al., 2003).

Successive missions carried out by the EU to assess the state of health control and monitoring in Uganda identified a number of problems in the regulatory system that was in place at that time. These missions highlighted that: (1) there was no clear division of labor and responsibilities between the competent authority in charge of fish safety (UNBS) and the authority overseeing and inspecting fishing and processing operations (DFR); the two institutions reported to different ministries and had no memorandum of understanding; (2) DFR inspectors could not carry out their duties as they lacked clear guidelines and standard operating procedures; (3) District Fishery Officers did not report to DFR but to the Ministry of Local Government and did not follow instructions on hygiene and handling procedures; (4) there were no laboratories for the appropriate evaluation of pesticides residues; and (5) landing sites did not meet EU requirements; fish handling was unhygienic throughout the chain (EC, 1998, 1999, 2000).

The third ban was finally lifted in July 2000, when Uganda was placed on the EU List II. This was the result, among other changes, of having developed standard operating procedures for the competent authority (DFR), having achieved transparency, and having installed a document control system. This was done in close collaboration with the industry. In 2001, Uganda was placed back on List I (Tanzania was placed on List I in 2000; Kenya in 2004).

The dominant view among Ugandan officials is that it was reasonable for the EU to guarantee the safety of fish for its consumers. What they could not accept was the EU's lack of scientific proof for their claims. Rather than showing that fish were "unsafe," the EU justified its import bans on the basis of faulty control and monitoring systems. In relation to the "cholera ban," the WHO gave evidence that there was no risk involved in exporting fishery products. Yet, this came too late to undo the damage the ban had done to the industry. In relation to the "pesticide ban" the then competent authority (UNBS) misled the EU to believe that pesticide residues could actually be detected in the waters of Lake Victoria. DFR inspectors and several processors claim that thousands of specimens were analyzed, and there was never any evidence of residues in the water, sediment, or fish. The focus of the bans was on procedural issues, rather than on the safety of the product. It may be technically feasible to kill and harvest tilapia by using pesticide in shallow waters. However, it is not possible to use such a technique to harvest Nile perch, a fish that lives in deeper waters. The risk of pesticide contamination in the export value chain was basically non-existent. In addition to this, it is actually possible to identify pesticide use in fishing with a simple visual examination. Ugandan authorities had simply been honest (and perhaps naïve) with the EU, pleading for time until they solved the situation. They were not expecting a ban and especially not one that remained in place for over a year. The EU asked for proof that no pesticide residues be present in fish for export. Yet, Uganda needed a laboratory to handle this, which was not available locally. As a result, the fish processing industry had to ask a Belgian company to recreate European laboratory facilities in Uganda (cf. Waniala, 2002).

The EU import bans had wide-ranging effects in Uganda. In addition to lower fish exports and loss of export revenue, negative repercussions were felt in fishing communities, among fish processors and related service industries (e.g., packaging, transport). As a result of the bans, three plants closed down completely. The rest worked at 20% capacity and 60–70% of their employees were laid off. Three other plants later changed hands and were re-designed.

At the same time, compliance with EU standards (including HACCP systems) by the Ugandan fish industry in reaction to the import bans resulted in: (1) streamlined regulation with a strengthened competent authority under one roof (DFR); (2) the formulation of a new fishery policy; (3) improved monitoring and inspection systems, with the drafting of inspection manuals and standard operating procedures and the training of inspectors; (4) regional efforts for the harmonization of handling procedures in the three countries sharing Lake Victoria; (5) upgrading of a small number of landing sites and plans for upgrading a substantial number of others; (6) upgrading of processing plant procedures and design; (7) the installation of two laboratories and general improvement of the quality of service provision to the industry; (8) an increased number of processing plants and improved export performance; and (9) opening up of the US market, which requires HACCP compliance as well.

Alchemic rituals

Laboratory testing and document trail systems in Uganda and elsewhere provide the apparatus that makes rituals of verification possible. These are rituals because they are intended to conform to a pre-determined outcome resulting from a specified set of procedures, no matter what the actual practices are. Their alchemic nature derives from various aspects: a striving for perfect/minimum risk food safety; the secrecy surrounding laboratory tests and the redress of "unsafe" situations; and the economic and political imperative of turning fish into a valuable resource. At the time of fieldwork, a number of features of the Ugandan fish safety management system existed only on paper. The following comments should not be read as a "to do" list for the Ugandan authorities but rather as an indicator of the limitations of food safety systems "in practice" and the ritualistic aspects that are embedded in them. Monitoring of hygiene and handling practices in Uganda focuses on approved landing sites, where good infrastructure is present and quality management procedures are in place. These sites land only a small proportion of fish caught on the lake. As noted above, most other fish are trans-shipped from other landing sites to approved landing sites, or procured directly at basic sites. According to survey results, handling of fish at basic landing sites is still generally inadequate (Kyangwa et al., 2002) . It is done on rudimentary wooden racks and small grass thatched roofs. Fish are often thrown or dragged through contaminated muddy waters, thus bruised. Washing of fish with lake water that is contaminated with human and animal waste increases bacterial contamination (NARO, 2001; Namisi, 2002).

Proper traceability can only be assured at the level of an individual truck delivering to a factory. These trucks usually visit several landing sites and can be on the road for up to 3–4 days before unloading at the factory. Even if they visit only one landing site, they may buy from up to 25 boats that come from 3–4 island landing sites. In short, relatively little is known about the origin of the fish. This is not necessarily a problem in terms of EU regulation on traceability, which requires only a "one-step-back, one-step-forward" system and does not extend to third-countries. However, it will become more of an issue as fish buyers in Europe (especially supermarket chains) move towards ensuring full traceability from boat to plate. They are unlikely to accept traceability only at the level of "what fish species from what lake."

Fishery inspectors recognize that the implementation of HACCP has helped processing factories to upgrade their operations, develop better plans, and handle fish more systematically. However, they question whether product testing, the ultimate verification tool, is needed on all consignments before export. HACCP is itself a risk-minimizing tool and does not require product testing.[9] EU regulation does not necessarily require product testing either, only "where necessary" (see Regulation EC 854/2004). It certainly does not require product testing on all consignments. There have been no visits from EU inspectors since 2000, and there has been no red alert/product recall from official authorities in the EU ever since. If HACCP is functioning properly, and the Ugandan fish industry and EU regulators argue that it is, there should be no need for product testing. At the same time, a key informant stated that the quality assurance system in Uganda is slowly deteriorating as a result of a lack of follow-up visits from the EU after the end of the import bans. All factories are under pressure to find ways around mandatory tests, and some have done so. Apparently, testing laboratories are under pressure to be lenient on microbiology results or risk losing their client base, and at least one company switched from one laboratory to another because "results were too bad."

In the last few years, factories have been closed down temporarily by DFR when fish safety problems emerged. Due to the fact that the complete set of microbiological results takes five days to be ready, the quality assurance system is run on a recall basis for chilled fish. A key informant, however, claimed that fish consignments are rarely if ever recalled – normally problems are settled with a price discount. Although this may be a normal commercial practice, it still begs the question of why the ritual of establishing and monitoring strict EU standards takes place, when sub-standard fish are sold anyway. At the same time, better monitoring and documentation systems have allowed Ugandan processors to occasionally counter-act quality claims from European buyers (e.g., by providing proof that temperature surges took place in facilities outside their jurisdiction). The alchemic ritual of product testing and systemic verification not only assuages the food contamination fears of European regulators and consumers, it also provides a paper trail for a parallel world of commercial arbitration.

A final aspect of the alchemy of fish safety management system is that it is based on an internal and confidential system of redress, rather than on the purveyed external and transparent system of monitoring, verification, and sanction. Basically, if a problem is found within Uganda, a factory is closed down quietly and the problem is rectified without much fanfare. The argument in the industry is that if problems emerged at one of the factories, and they were reported to the EU authorities, the plant will take at least six months to recover and start exporting again. Thus in practice, if a private buyer in Europe encounters a quality problem on a consignment, this is resolved through private negotiation (and often a price discount) or arbitration. This is a reasonable system considering what happened the last time the Ugandan authorities tried to be frank and transparent – the EU imposed a long import ban. The lack of subsequent inspections by the EU and the accepted wisdom that a small number of upgraded sites handle **all** fish for export suggest actions of willing negligence on the part of the EU – a performance ritual to show its consumers that "everything is fine in the system."

Bans, tests, and alchemy

Busch and Tanaka (1996) have aptly described standards as instruments that are used to subject people and nature to "rites of passage" in order to assess their "goodness." The different kinds of tests that come together with these rites have different consequences for behavior and different effects on how power and status are redistributed among actors, both human and non-human. Tests and associated standards "create, maintain, and change [commodities, while at the same time] monitor, control, and organize the behavior of each of the actors" (Busch and Tanaka 1996: 23). In a similar vein, Busch argues that "grades and standards are ways of defining a moral economy, of defining what (who) is good and what is bad, of disciplining those people and things that do not conform to the accepted definitions of good and bad" (2000: 274). In short, standards: "(1) are the means through which objectivity is produced in the market; (2) can never be fully specified and are always subject to renegotiation in light of future events; and (3) are always discussed **in practice** as subject to complete specification" (2000: 276, original emphasis). The Nile perch case study has highlighted how these three aspects are at play – laboratory tests and quality management systems provide "objectivity"; EU regulation changes often but is presented each time as a coherent, complete whole; and systems are put in place that cover everything from boat to plate, although large parts of the system exist only on paper.

The Nile perch export industry in Uganda has transformed its operations dramatically since the inception of the EU import bans in 1997. Regulations and operating procedures have been put in place to monitor fish quality. Processing plants are now HAACP compliant, and in the process, have upgraded in terms of infrastructure and system operations. They even achieved International Standards Organization (ISO) 9000:2001 certification. Exports and foreign exchange earnings have increased to much higher levels than in the period preceding the EU bans. Uganda's quest to turn fish into gold on Lake Victoria is back, with the addition of the modern-day alchemy of laboratory tests, system performance, and "total quality management."

Yet, the fish safety management and traceability systems in practice are applied to only half of the Ugandan value chain – from selected landing sites to export. Even within this half of the value chain, cracks and inconsistencies are emerging. The quality of landing site inspections is reported to be unsatisfactory. The costs of continuing to test every export consignment are exacting. The export quality assurance system is run, in theory, on an ex-post recall basis, but in practice is privately based on commercial principles of redress of quality claims (price adjustments), not regulatory ones (seizure of consignments). While this is a reasonable development in view of previous experiences between Uganda with EU food safety authorities, it defies the very principle of risk minimization upon which food safety regulation is based. But again, this situation may not be substantially different than what happens within European boundaries.

The problem is that if the EU insisted on effective implementation in the other half of the value chain (from catch to landing site), the very nature of artisanal fishing on Lake Victoria would be in peril. A possible "second crisis" would result in a very different kind of fish industry at the catch level – one operating larger boats and fleets, more concentrated, and possibly foreign-owned or financed. The implications in terms of employment and incomes for lakeshore communities would be profound. There are serious hurdles to applying HACCP principles, Good Hygiene Practices (GHPs), and traceability on fishing boats. Both the Ugandan government and the EU are aware of the political clash between ensuring "total fish safety" for European consumers and a decent livelihood for Ugandan artisanal fishers. The idiosyncrasies of the fish safety system, including the alchemic rituals of testing and system verification, provide a solution to this dilemma.

This solution is perceived as "legitimate" in informal terms for a variety of reasons. A number of food scares that took place in developed countries in the 1990s have de-legitimized food safety control by government authorities, which used to be based on an inspection, seizure, and destruction system (Freidberg, 2004). In addition, consumer interest in quality attributes that are not directly measurable have led to systems-based approaches to food safety management, rather than to material inspection alone (Hooker and Caswell 1999b). The parallel between the new shape of regulation for management models applied in private standards is striking, especially as third-party certification increasingly provides a seal of legitimacy for quality control systems (Giovannucci and Ponte, 2005; Hatanaka et al., 2005). Food safety control measures by government authorities are now built upon the same principles that inform audited private standards. This consists of a paperwork-and-visit ritual, where documentation systems and traceability provide the legal basis of safety management and an insurance against legal claims in case of non-conformity. It is similar to established ISO standards for quality management (ISO 9000), combined with the specific requirements dictated by HACCP – the "bible" of food safety – and codes of Good Hygiene Practice (GHP) and Good Manufacturing Practice (GMP). Paper claims are based on other paper claims in a sort of "stacking-doll" system, where "scientific measurement," usually embodied in results from laboratory tests, provides additional justification. In other words, the protection of consumers from harm is achieved on the basis of properly-functioning systems rather than on product safety per se. At the same time, private standards are covering aspects that used to reside in the courtyard of regulation, such as social standards, labor conditions, and environmental impact. New generations of private standards (ISO 14000 and the upcoming ISO 22000 series) are adopting product and/or waste material testing that are traditional features of regulation, combined with document-based quality management systems. Private standards and public regulation are increasingly indistinguishable.

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Notes

1. In this article, “private” standards cover all standards (whether strictly private, third-party certified, or sectoral/voluntary codes) that are not explicitly included in regulation.
2. One of the anonymous reviewers suggested that contradictions mire food safety monitoring systems in the US as well. Another reviewer expanded on this point highlighting that, for example, open faced sandwiches are inspected by the US Department of Agriculture USDA, while closed sandwiches are inspected by the Food and Drug Administration (FDA).
3. On fisheries-related standards, see Constance and Bonanno (2000) for a discussion of Maritime Stewardship Council certification, Béné (2005) on how conflicting environmental discourses shape management practices in shrimp farming, and Mansfield (2003) on a discussion of what constitutes “organic” fish.
4. The extent of trans-shipping is not known. However, given the ratio of approved to non-approved sites and the high proportion of Nile perch that is exported, it is likely to be significant.
5. The high rate of growth of fish exports in Uganda from the late-1980s has been accompanied by a number of concerns regarding the environmental sustainability of the resource base (Ogutu-Ohwayo, 1999). Space limitations in this article do not allow a proper discussion of the contradictions of regulation enacted to ensure sustainability of the resource and market demand . For a synthesis of available evidence, see Kolding et al. (2005).
6. These figures capture only exports outside the region. On regional trade, see FIRRI (2003a).
7. In addition to official tests required by Ugandan regulation for all export consignments, tests are also carried out for private use by processors and importers. Importers carry out their own spot tests on consignments (about twice a month), both before export and at the import point. These are mainly microbiological tests.
8. From 1998, the EU started to place third countries that exported fisheries products into three lists. List I countries could export fishery products to the EU from any establishment approved by the competent authority. List II countries were authorized to export from a specific list of approved establishments. List III countries were deemed unable to provide guarantees of appropriate inspection and monitoring. In order to export from these countries, additional documentation and checks were needed and only individual establishments approved by the EU could export.

9. The cost of carrying out these tests is high. Microbiological tests cost US$52 per sample, and pesticide residue tests cost US$85. In addition to the tests mandated by Ugandan regulation, some importers have started asking processors for phosphate analysis of export batches. They want to make sure that no phosphate is used to increase the water retention of fish (it adds approximately 10% of water weight). Importers have also started to ask for tests for the listeria pathogen as well.

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Table 1. Fish exports from Uganda to all destinations (1990–2003)

Year	Fish exports by volume (tons)	Fish Exports by value (US$ '000)	Export unit value (US$/Kg)	Total Exports of all products from Uganda (US$ '000)	Fish exports as proportion of total exports (by value) (%)
1990	1,664	1,386	0.8	177,658	0.8
1991	4,687	5,313	1.1	184,263	2.9
1992	4,851	6,498	1.3	146,767	4.4
1993	6,138	8,943	1.5	201,231	4.4
1994	6,564	10,403	1.6	459,939	2.3
1995	16,046	17,541	1.1	553,938	3.2
1996	13,100	45,030	3.4	703,993	6.4
1997	11,819	27,864	2.4	594,628	4.7
1998	14,688	39,879	2.7	536,747	7.4
1999	9,628	24,837	2.6	478,750	5.2
2000	14,894	30,818	2.1	401,645	7.7
2001	28,119	78,150	2.8	451,765	17.3
2002	27,370	87,447	3.2	475,530	18.4
2003*	25,021	87,680	3.5	522,538	16.8

Sources: Department for Fisheries Resources and Uganda Export Promotion Board
Note: * December 2002–November 2003

Figure 1. Main characteristics and operators in the Uganda Nile perch value chain

- FISHERS
  - can be fishers/owners of own boat, owners of fleets, fleet managers, laborers on boats
  - fishers sell/deliver Nile perch to boat operators or their representatives (usually at island-based landing/trans-shipment sites); if operating closer to the shore, they may sell directly at the landing site
  - fishing/boat transport often vertically integrated
- BOAT COLLECTORS
  - often also own/finance a fleet of boats and/or fishing gear
  - boat collectors often procure ice from fish processing factories or their agents at the landing sites
- TRADERS AND AGENTS OPERATING AT LANDING SITES
  - independent traders
  - contracted traders operating with their own capital and trucks but obtaining ice and fuel from the processor on credit
  - commission agents or employees of industrial fish processors, operating the company's own trucks
- OTHER LANDING SITE-BASED OPERATORS
  - artisanal processors (Nile perch rejects or other species for domestic and regional markets)
  - local traders (transporting fish with bicycles, motorcycles, pick-ups, and, more rarely, trucks for local and regional markets)

- boat repair yards and fishing gear repair businesses

- INDUSTRIAL FISH PROCESSORS/EXPORTERS
  - Nine companies operating, for a total of 15 plants
  - Processing fillets, headed and gutted fish, whole fish and fish maws for export; chilled on ice or frozen
- QUALITY ASSURANCE LABORATORIES, CONSULTANTS, TRAINERS AND CERTIFIERS
  - for GMP, HACCP compliance, ISO certifications
  - servicing industrial processors
  - two certifying agencies
  - a few training and consulting companies
  - two locally based laboratories, both carrying out microbiology tests; one carrying out pesticide residue tests
- COLD STORAGE, HANDLING, FREIGHT AND OTHER LOGISTICAL SERVICES
  - Several clearing and forwarding agencies
  - Two cargo airlines
  - Several passenger airlines transporting fish cargo
  - Two cold storage/handling facilities
  - Two importers with local operations providing logistical services and cargo consolidation
  - Product forms for export:
  - Chilled fish is packed on ice in polystyrene boxes and air-freighted from Entebbe airport
  - Frozen fish is packed in carton boxes, loaded in temperature-controlled containers, and sea-shipped from the port of Mombasa, Kenya
- OTHER OPERATORS IN THE DOMESTIC FISH MARKET
  - Local traders/distributors
  - Artisanal processors and traders of by-products sourced from industrial plants (mostly skins, skeletons, and trimmings)
  - Fish mongers
  - Supermarket chains (Uchumi, Shoprite, Payless)

Year	Fish exports by volume	Fish Exports by value	Export unit value	Total Exports of all products from Uganda	Fish exports as proportion of total exports (by value)
	(tons)	(US$ '000)	(US$/Kg)	(US$ '000)	(%)
1990	1,664	1,386	0.8	177,658	0.8
1991	4,687	5,313	1.1	184,263	2.9
1992	4,851	6,498	1.3	146,767	4.4
1993	6,138	8,943	1.5	201,231	4.4
1994	6,564	10,403	1.6	459,939	2.3
1995	16,046	17,541	1.1	553,938	3.2
1996	13,100	45,030	3.4	703,993	6.4
1997	11,819	27,864	2.4	594,628	4.7
1998	14,688	39,879	2.7	536,747	7.4
1999	9,628	24,837	2.6	478,750	5.2
2000	14,894	30,818	2.1	401,645	7.7
2001	28,119	78,150	2.8	451,765	17.3
2002	27,370	87,447	3.2	475,530	18.4
2003*	25,021	87,680	3.5	522,538	16.8

Table 1: Fish exports from Uganda to all destinations (1990-2003)

Sources:

Fish export volumes and values: elaboration from DFR data.

Total exports of all products: data from Uganda Export Promotion Board

Note: * Dec 2002-Nov 2003

[1] In this article, 'private' standards cover all standards (whether strictly private, third-party certified, or sectoral/voluntary codes) that are not explicitly included in regulation.

[2] One of the anonymous reviewers suggested that contradictions mire food safety monitoring systems in the US as well. Another reviewer expanded on this point highlighting that, for example, open faced sandwiches are inspected by the US Department of Agriculture USDA, while closed sandwiches are inspected by the Food and Drug Administration (FDA).

[3] On fisheries-related standards, see: Constance and Bonanno (2000) for a discussion of Maritime Stewardship Council certification; Béné (2005) on how conflicting environmental discourses shape management practices in shrimp farming; and Mansfield (2003) on a discussion of what constitutes 'organic' fish.

[4] The extent of trans-shipping is not known. However, given the ratio of approved to non-approved sites and the high proportion of Nile perch that is exported, it is likely to be significant.

[5] The high rate of growth of fish exports in Uganda from the late-1980s has been accompanied by a number of concerns regarding the environmental sustainability of the resource base (Ogutu-Ohwayo, 1999: 11). Space limitations in this article do not allow a proper discussion of the contradictions of regulation enacted to ensure sustainability of the resource and market demand (for an analysis of this kind, see Ponte, 2005).

[6] These figures capture only exports to outside the region. On regional trade, see FIRRI (2003a).

[7] In addition to official tests required by Ugandan regulation for all export consignments, tests are also carried out for private use by processors and importers. Importers carry out their own spot tests on consignments (about twice a month) both before export and at the import point (mainly, microbiological tests).

[8] From 1998, the EU started to place third countries that exported fisheries products in three lists. List I countries could export fishery products to the EU from any establishment approved by the competent authority. List II countries were authorized to export on the basis of a specific list of approved establishments. List III countries were deemed unable to provide guarantees of appropriate inspection and monitoring. In order to export from these countries, additional documentation and checks were needed and only individual establishments approved by the EU could export.

[9] The cost of carrying out these tests is high: microbiological tests cost US$52 per sample; pesticide residue tests cost US$85. In addition to the tests mandated by Ugandan regulation, some importers have started asking processors for phosphate analysis of export batches. They want to make sure that no phosphate is used to increase the water retention of fish (it adds approximately 10 per cent of water weight). Importers have also started to ask tests on the listeria pathogen as well.