

Nile perch and the hungry of Lake Victoria: Gender, status and food in an East African fishery

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Abstract

Lake Victoria supports Africa's largest inland fishery, and its most valuable product is the Nile perch, much of which is exported. This has given rise to arguments claiming a direct linear relationship between perch exports and disturbingly high rates of malnutrition along the lake's shores. In this paper, we argue that this argument is seriously flawed for it is unable to explain how it is that the income from the Nile perch fishery fails to translate into a well-fed riparian population. We draw on field work carried out in 2001 that (a) set out to establish exactly how much malnutrition there was on the lake's shores; and (b) sought to identify what happened to the income the fishery generates. We argue that because men control much of the fishery, and women are held responsible for the upkeep of their families, little of this income makes its way back into the households of the region, giving rise to the levels of malnutrition we observed. © 2007 Elsevier Ltd. All rights reserved.

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Introduction

A background to Lake Victoria's fisheries

Lake Victoria is one of Africa's Great Rift Valley lakes. Covering 68,800 km², and it supports one of the world's largest freshwater fisheries. By the end of the 1940s, fish stocks were under severe pressure, occasioned by (a) the growth in the fish market and associated transport infrastructure that saw fish being transported down the railway line towards the East African coast; and (b) the arrival of improved fishing technologies, which saw boats (and,

indeed, whole fleets) being used to catch fish, and flaxen gill nets (Geheb, 1997). Debate surrounding how to remedy this trend focussed on the introduction of exotic fish species. In the early 1950s, colonial fisheries authorities introduced four exotic species of tilapia to supplement dwindling stocks of two endemic tilapia species. The rather more controversial consideration was what to do about the enormous amount of *Haplochromis* in the lake. Most of the members of this fish species 'flock' had little economic value, yet comprised some 90% of the lake's fish biomass, and contained within it some 500 different species. For some, the lake needed a robust predator to take advantage of this food source, and turn it into economically more valuable forms of fish meat. The prime candidate here was a magnificent predator, the Nile perch (*Lates niloticus*), capable of growing to up to 200 kg in weight. For other thinkers, this was a course far too risky, not least because of the remarkable diversity of Haplochromines, and their

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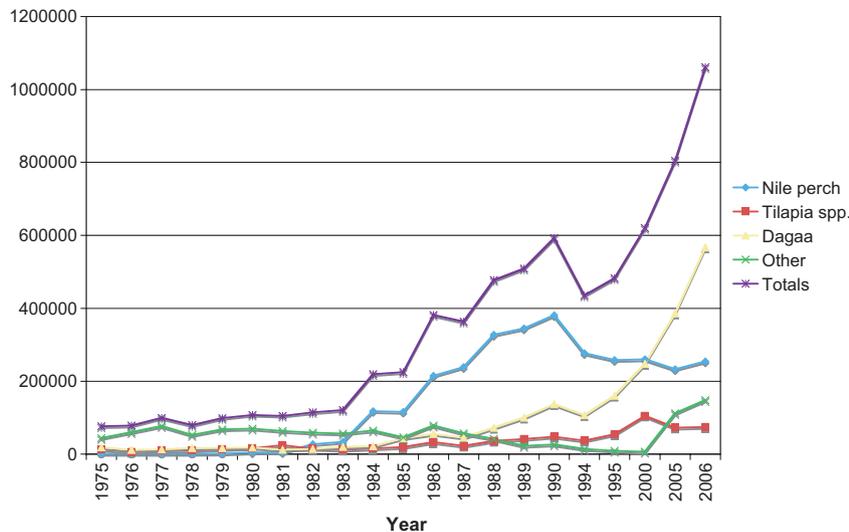


Fig. 1. Fish landings from Lake Victoria for selected years, 1975–2006. Note: *Haplochromis* species make up the bulk of ‘other’ fish species. Sources: LVFRP fish catch database (LVFO, 2007a).

improperly understood evolution. In 1954, however, the perch was surreptitiously introduced into the lake. Combined, these introductions were to radically transform the lake, both ecologically and economically. Insofar as the fishery is concerned, these introductions had five main impacts.

The first of these was the rise of the Nile perch. The fish took some time to establish itself, and only began to appear catch statistics in the mid-1970s. By the 1980s, the ‘explosion’ of this species was being referred to as the Nile perch ‘boom’. Catches climbed from about 335 mt in 1975, to a peak of 380,776 mt in 1990 (Fig. 1).

The second impact was the Nile perch’s devastation of the *Haplochromis* species flock, its main food source. By the time the Nile perch had established itself, the contribution of *Haplochromis* to the lake’s fish biomass had declined from 90% to less than 1%. An estimated 200 species were driven to extinction (Seehausen et al., 1996), an event that has been described as one of the greatest mass species extinction events in recent history (Kaufman, 1992), and is well described elsewhere (Witte et al., 1992; Goldschmidt et al., 1993). Catches of this species crashed.

The third impact related to the lake’s diminutive endemic sardinella, the ‘dagaa’ (*Rastrineobola argentea*). Freed from competition (with *Haplochromis* spp.) for food sources, this species thrived. It was not the main target of the Nile perch, and catches increased spectacularly from 13,000 mt in 1975, to an all time high 567,268 mt in 2006.

The fourth main impact of the introductions related to the exotic tilapia species. One of these, the Nile tilapia (*Oreochromis niloticus*), was to establish itself firmly in the fishery. Fishing pressure combined with competition from the exotic fish forced one native species into extinction, and the other to near extinction. Tilapia catches from the lake rose from about 13,000 mt in 1975, to an all time high of around 105,000 mt in 2000.

There can be little doubt that these introductions saved the fishery from collapse (Reynolds et al., 1995): “On the face of it... the lake after the debut of *Lates* [Nile perch] has turned into a fish producer that can only be described in Gargantuan terms” (Reynolds et al., 1995, p. 182). With such staggering increases, so too the entire production system on the lake has changed, the fifth and final key change.

Prior to the arrival of the colonial administration, the fishery was dominated by fishermen (mainly, although certain fishing techniques were reserved for women) who owned their labour and their fishing gear. Contributing to the near-collapse of the fishery in the 1940s and 1950s was the reorganisation of the fishery into fleets drawing on hired labour and much improved gear (Geheb, 1997; Asowe-Okwe, 1996). The Nile perch ‘boom’ was to accelerate and massively expand this process. It coincided with an emerging European market for high-quality white fish meat, prompting the development of industrial fish processing capacity along the lake’s shores in Kisumu, Musoma, Mwanza, Entebbe and Jinja (Harris et al., 1995). The export of Nile perch has since expanded away from the European Union (EU) to the Middle East, the United States and Australia, and now represents large foreign exchange earnings to the lake’s riparian states of Uganda, Kenya and Tanzania. In Uganda, indeed, its export is second only to coffee in the rankings of export earnings.² In 2006, the total value of Nile perch exports from the lake was estimated to be US\$ 250 million (LVFO, 2007a). The main market for the perch remains the EU, and the industry is, therefore, subject to the worries of EU health and safety inspectors. The EU has frequently closed its doors

² Not all of Uganda’s Nile perch is derived from Lake Victoria, and a proportion of the country’s stated catches come from lakes Albert, Kyoga and Edward.

to the export for reasons ranging from unsatisfactory hygiene at factories to cholera outbreaks on the lakeshores.

With such high demands for Nile perch, the value of the fishery has risen considerably. Labour inflows into the fishery have increased along with growing demand. In 1983, there were an estimated 12,041 boats on the lake. By 2004, there were 51,712, and 153,066 fishermen (LVFO, 2005). The fishery also generates indirect employment for additional multitudes of fish processors, transporters, factory employees and others. All along the lakeshore, ‘boom towns’ have developed in response to the demands of fishing crews with money to spend from a day’s fishing. These towns resemble shanties, and have little in the way of services. Of the 1433 landing sites identified in the 2004 frame survey, just 20% had communal lavatory facilities, 4% were served by electricity and 6% were served by a potable water supply (LVFO, 2005).

Labour relations in the fishery can today be broadly characterised as follows: fishing effort is divided between gear and boat owners (*tajiri* in Tanzania) and labourers. Many fishermen gain entrance to the fishery through the *dagaa* fleets, where labour demands are highest, although the Nile perch fishery, because of its relatively higher value, also attracts many entrants. Many *tajiri* operate directly on behalf of fish processing factories, who may also, in turn, own many of the vessels on which they rely for supplies. Fishing factories often ‘tithe’ suppliers, by providing them with nets and outboard engines (so that they can fish further afield). In this way, fishermen are obliged to sell their catch to the factories who have supplied them with their equipment, which they pay back slowly over time. The relationships between fishermen and the factories are highly unequal. Conditions within the fishery are tough, and income from it very unevenly distributed (cf. Harris et al., 1995; Gibbon, 1997a,b).

A key point to note at this stage is that virtually all of those involved in the actual harvest of the fish are men. Women tend to work peripherally, buying up fish supplies that are not otherwise taken by the fish filleting factories or, indeed, growing numbers of animal feed industries that exploit the *dagaa*. Women often process fish to add value to it and/or are involved in other petty trade. Women cannot typically compete with fish processing factories for supplies. Regionally (in the late 1990s) most traders and processors are female: 56% of those involved in the trade are women ($n = 817$). In Uganda, the fish trade is divided roughly by half between the genders (48% female, $n = 300$). In Kenya, just 16% of trader/processors are men ($n = 259$), compared to Tanzania where just 22% are women ($n = 168$). As more and more men enter the fishery, men may find themselves unable to gain an entry point into the fishery and seek to start trading. In Tanzania, this appears to have occurred, while it is well underway in Uganda (figures derived from a non-random sample; SED-AWOG, 1997). Note, however, that membership of a fishing community does not automatically mean that women are involved in the fish trade, as will be discussed below.

Consumers around the lake overwhelmingly prefer to eat tilapia species. Because of its high demand, however, it tends to command a high price. Similarly, because Nile perch is in high demand from the fish factories, it too commands a high price (although somewhat cheaper than tilapia). *Dagaa* is by far the cheapest fish.

Presently, massive fishing pressure on the Nile perch have enabled *Haplochromis* stocks to resurge (Balirwa et al., 2003; Fig. 1), with remarkably high landings for 2006 (Fig. 1). From 2000 to 2004, the number of gill nets on the lake grew by 37% (LVFO, 2005). Note too that a large proportion of this catch is *dagaa*, which continues to thrive. In addition, juvenile fish are increasingly targeted, in part because very few mature fish remain, but also because (in the case of the Nile perch) smaller fish sizes are demanded by consumers in export destinations. Hence, illegal gill nets and outlawed fishing techniques are common. 11.5% of gill nets were below the legal 5-in. minimum mesh size in 23,004, and there were 3355 beach seines (an illegal fishing gear) on the lake (LVFO, 2005). Fishing trends coupled with other environmental changes (not discussed here: see Balirwa et al., 2003) suggest that this fishery is not currently sustainable (Matsuishi et al., 2006).

Developing a narrative: Nile perch exports and hunger

In 1991, Kirema-Mukasa and Reynolds (1991) were the first to voice the concern that fish exports may either contribute to food insecurity within the region or else that they might prevent its alleviation. This perspective has since been expanded and developed to argue that the net export of perch from the region is a commensurate loss of food protein for riparian fishing communities, and that a direct link can be made between the export and lakeside levels of malnutrition. This ‘...unrestricted trade [in Nile perch] has contributed to food insecurity and reduced nutrition by taking out substantial quantities of fish to global markets, which would otherwise be available to local customers’ (Abila, 2003, p. 139; see also Abila and Jansen, 1997; Jansen, 1996; Bokea and Ikiara, 2000). Additionally, ‘empirical evidence... vividly show that the growing export of the Nile perch and the commercialisation of the *dagaa* are undermining the survival of households’ (Mugabe et al., n.d.). In the absence of any previous nutritional baselines from the lake, these assertions are speculative – it is not possible to determine whether or not food security has declined for whatever reason.

While there is plenty of evidence of malnutrition along Lake Victoria’s shores (see below), there is, however, no evidence to suggest that this has a direct link with the Nile perch export, particularly given the growth of the sector and accompanying job and income creation, which should suggest compensatory increases to purchasing power. There are many candidates for poor malnutrition on the lake, and include poor sanitation, extremely high HIV/AIDS rates around the lake, high malaria rates and so on, all of which may to lesser or greater degrees contribute to its malnutri-

tion rates. In this paper, we focus on a key area wholly neglected by the anti-export proponents, the nature of household food security in Africa. In particular, the argument ignores the divisive relationships between men and women in lakeside communities. Two key points are central to this paper: first, a key failure of the anti-export monologue is that it focuses on fish as the main resource of contestation; this is incorrect. It is *cash* and the way this is distributed within households that matters here, and not fish or any other source of nutrition. Second, central to the argument in this paper is the lack of access that women have to the fish and other resources of Lake Victoria.

Methods

This paper draws on the research and experiences of a nutrition survey carried out by the Lake Victoria Fisheries Research Project (LVFRP) (see Geheb, 2002). The survey sought quantitative (anthropometric) data to *define* the sta-

tus of malnutrition on Lake Victoria's shores, and qualitative (Participatory Rural Appraisals) to *explain* it.

Anthropometric survey

This survey based its findings on the anthropometric measurement of randomly selected mothers and their children, distributed amongst 44 randomly selected lakeside locations (Fig. 2), stratified by country.

Data from 649 mothers and 620 children (i.e. less than 60 months old) were collected. In the case of mothers, Body Mass Indices (BMIs) were gathered; in the case of children, Weight for Age, Height for Age and Weight for Height. The figures were plotted against the National Center for Health Statistics' growth chart (NCHS, 2000). The different outcomes established the degree of malnutrition (Protein Energy Malnutrition) and the kind (chronic or acute). Quantitative data on income streams were not collected.

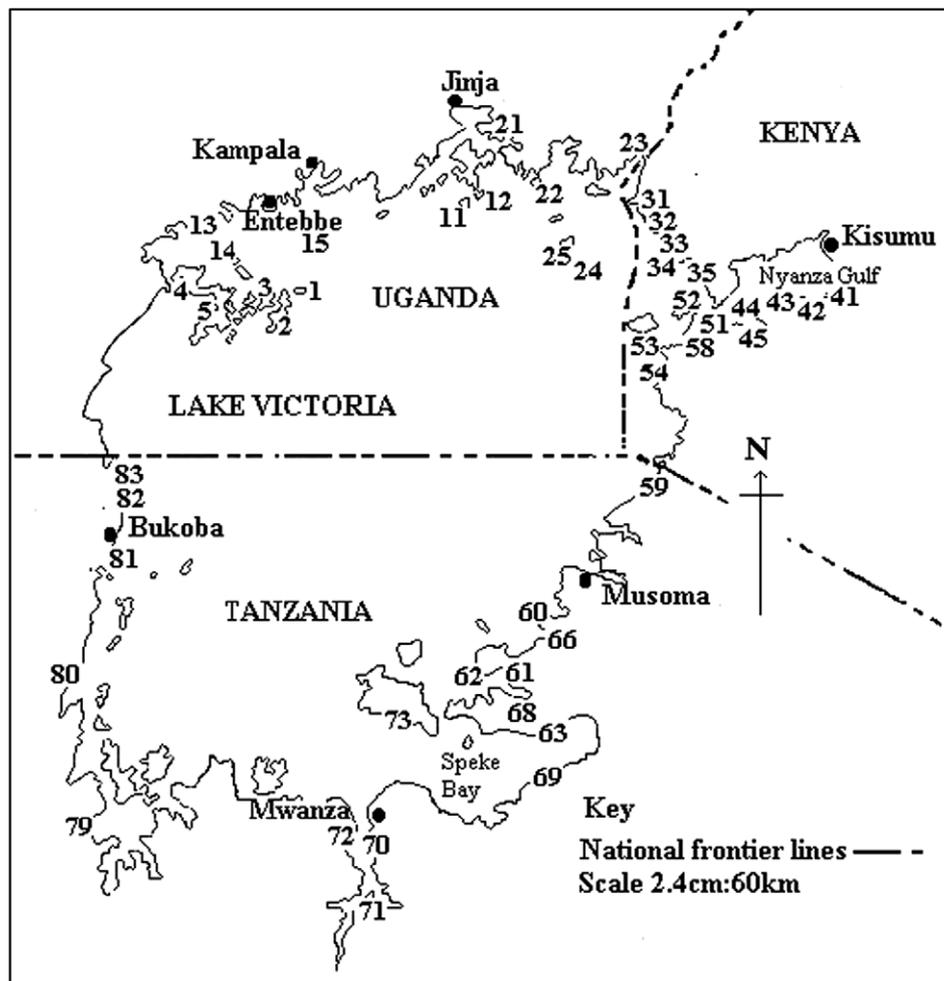


Fig. 2. Location of survey sites for the LVFRP Nutrition Survey. Key: (names in bold denote research sites where PRAs were carried out). 1 Lwazi 2 Buyange 3 **Kitobo Island** 4 Bugoma 5 Kyabuyima 11 Namatala (Buziru) 12 **Gunda (Mpata)** 13 Lyabana 14 Buganga 15 Nsazi 21 **Buluba** 22 Lufudu 23 Majanji 24 Siro 25 Buluba 31 Bulwani 32 **Namabusi** 33 Nalera 34 Mageta Island 35 Riskis Kogwari 41 Singida 42 Sango Rota 43 **Miti Mbili** 44 Achuocho 45 Ngegu 51 Lela 52 Kaswanga 53 Kibuogi 54 **Nyagwethe** 59 **Nyang'ombe** 60 Bwai 61 Busekela 62 Bwasa 63 Guta 68 Igundu 69 Bukome 70 Mwalogwabagole 71 Nyabusalu 72 **Kahumulo** 73 Namasabo 79 Nyamirembe 80 Katunguru 81 Kigona 82 **Kifungu** 83 Karwazi.

Participatory Rural Appraisals (PRAs)

In the first instance, PRAs were carried out at four of the landing sites selected for the nutrition surveys in each of the countries (i.e. a total of 12); in the second, intensive follow-up PRAs were carried out at eight sites distributed between Tanzania and Uganda (Kalloch, 2000). In each randomly selected PRA survey village, four focus group discussions were planned, targeting fishermen, female fish traders/processors, mothers and fathers. These four groups were chosen to represent different gender and economic strata in local communities. The total number of focus group respondents was 254. At each beach, informal interviews and observations were also collected (Table 1).

Malnutrition in East Africa

Malnutrition is typically referred to as Protein Energy Malnutrition (PEM). This is a misleading term because it draws attention to the lack or absence of protein from the diet that in and of itself is not necessarily a root cause of malnutrition. While proteins and fibres, starchy foods and micronutrients all play a role in a balanced diet, it is the absence of energy (measured in calories) that is the more likely candidate for malnutrition. For this reason PEM (for the term still persists) may be defined as ‘...undernutrition resulting from a lack of food containing the nutrients from which energy is derived’ (Ministry of

Foreign Affairs, 1998, p. 9). Malnutrition rates in East Africa are high (Table 2).

Average energy consumption in all three countries is less than the minimum 2600 kilocalories (kcal) a day recommended by the FAO. Average calorie intake, indeed, has steadily declined in all three countries, from 2206 kcal in 1979 to 2158 kcal in 2002 (FAOSTAT, 2004). The daily contribution of animal products to per capita calorie intake has, since the early 1960s, always been very low in East Africa, and average contribution only exceeded 8% in the decade from 1990 to 1999. The contribution of fish to the total caloric intake of East Africans never exceeded 1.1% between 1979 and 2002, and the proportion of fish in national protein intakes in East Africa has never exceeded 7.7% over the same period (FAOSTAT, 2004). It is therefore difficult to attribute rates of malnutrition amongst East Africans to the absence or lack of fish (alone) from their diets.

While it can be agreed that starvation and chronic malnutrition result directly from insufficient quantities or types of food, it is often very difficult to find situations in which the absence of food is complete. The causes of malnutrition are, therefore, better described in social, economic, political and cultural terms, because these define the relationships between people and the commodities on which their nutritional health relies (Sen, 1981). As such, UNICEF’s ‘Underlying causes of malnutrition and mortality’ does not attribute malnutrition to the absence of food alone

Table 1
Breakdown of participants of focus group discussions (FGDs) held during the survey

	Mothers' FGD	Fathers' FGD	Female fish processors' FGD	Fishermen' FGD	Community leaders' FGD
<i>Tanzania</i>					
Kemondo	6	7	8	6	11
Nyamkazi	12	8	13–20	12	–
Katunguru ^a	10	6			–
Mihama	6	9	9	12	–
<i>Uganda</i>					
Kitobo	7	8	6	8	–
Kyabuyima ^a	14	20			–
Bugoma ^{b+}	12	8			–
Nkombe ^a	11	8–18			
Totals	78	84	43	38	11

^a Focus groups were combined.

^b Only the mother's and father's focus groups were conducted due to lack of time.

Table 2

Nutritional status of children sampled during the LVFRP Nutrition Survey (Medard et al., 2002); national averages from UNICEF (2007) and refer to average rates, 1996–2005; figures in brackets refer to total sample size

Country	Stunted		Wasted		Underweight	
	Survey	National average	Survey	National average	Survey	National average
Uganda	43.3% (194)	39%	4.7% (181)	4%	17.0% (194)	23%
Kenya	26.7% (120)	38%	3.4% (119)	6%	14.9% (121)	20%
Tanzania	44.5% (236)	38%	3.4% (235)	3%	19.5% (236)	22%
Totals	40.2% (550)		3.9% (545)		17.6% (551)	

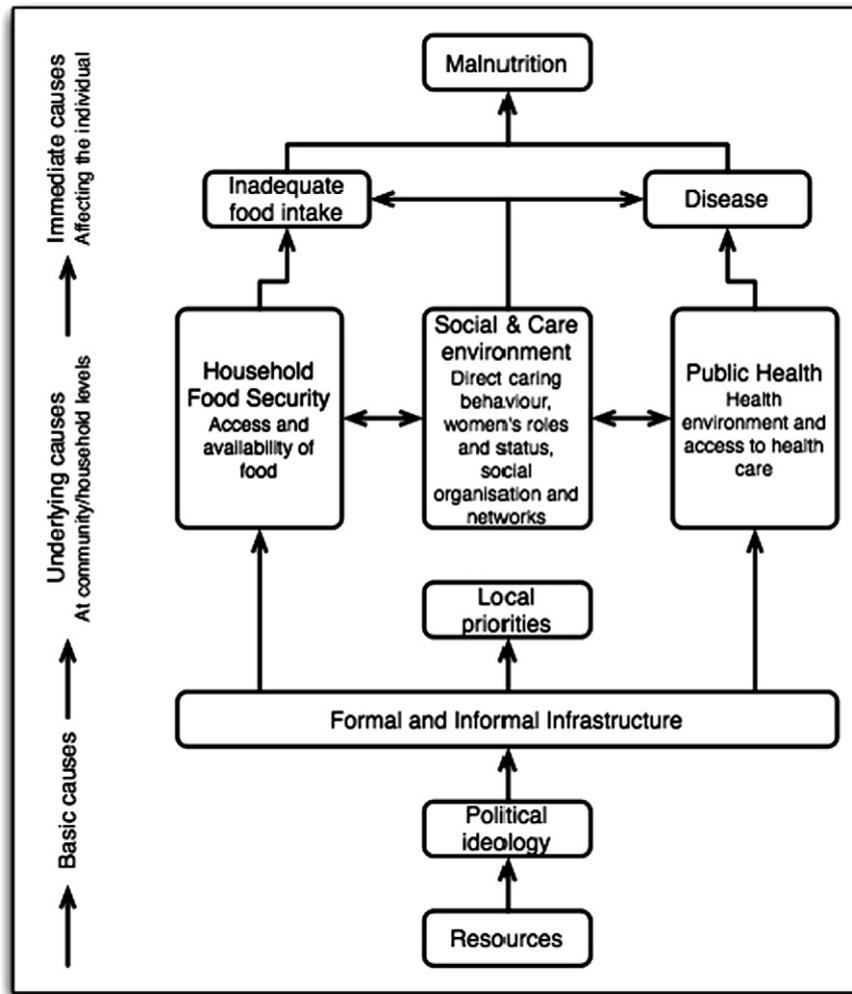


Fig. 3. UNICEF framework of underlying causes of malnutrition and mortality.

(Fig. 3), and one notes the prominence of the household, and the relationships between a variety of causative agencies, in determining food security and nutritional status.

The evidence contained within the literature and the findings reported here all bear out this perspective, and suggest that malnutrition is not born out of a single, linear relationship between malnutrition and food exports. Even under famine conditions (see examples in Sen, 1981), the causes of starvation are numerous, complex and multifaceted.

In the developing world, male malnutrition closely matches female malnutrition (with the exception of South Asia). Women, are, however, the primary care-givers to children. This singular characteristic places a heavy burden on women and is the reason why studies of malnutrition typically focus on women and children, and not on men (Nubé and Van Den Bloom, 2003).

The debate surrounding Lake Victoria's Nile perch exports closely resembles that surrounding cash crops (cf. Longhurst, 1988). Kennedy et al. (1992) argue that while cash crops do increase the amount of cash available in a household, this would appear to have no effect on the

health of pre-school children in developing countries, neither improving nor worsening it. The cause, therefore, must then lie in the way cash is divided and spending patterns within the household. A key variable in this respect is the status of women. Household and malnutrition studies define this as a woman's relative bargaining power vis-à-vis men (Smith et al., 2003). Status is much affected by control over resources, and this is just as true for Lake Victoria's fisheries as it is for cash crops, land and agroforestry (cf. Meinzen-Dick et al., 1997; Mearns, 1997; von Bulow and Sørensen, 1993).

The East African household is, increasingly, no longer the undifferentiated unit around which a 'family' may be defined, but the arena within which intense competition between men and women are played out (cf. Quisumbing, 2003a). It represents women's struggles to obtain some share of their husbands' incomes, and men's struggles to maintain traditional positions of dominance and privileged access to income-generating resources (cf. Francis, 1995). The kinds of income-generating niches that women are allowed to exploit are limited and their access to resources often curbed by competition with men, the strictures of tra-

ditional gender roles and the limited assets available to women to establish businesses. These struggles suggest, of course, intra-household conflicts. As with any conflict, it makes sense to describe extreme positions so that their nuances can be discerned under less conflictual conditions. We, like other researchers on this topic (cf. Holboe-Ottesen and Wandel, 1991), describe these extremes.

A key point to reiterate here is that the commodity at the centre of the struggle between men and women, and which may make the difference between livelihood failure and success, is cash. It is *not* fish, agricultural produce, handicrafts or the numerous other outputs of East African rural economies.

Malnutrition on the shores of Lake Victoria

At fish landing sites surveyed for this study, an average of 40.2% of children were stunted, and the remainder were not ($N = 550$) (Medard et al., 2002). Results were best from Kenya, where 73% of landing site children were well nourished, and worst in Tanzania, where 55.5% were well nourished (Medard et al., 2002). Wasting (a dangerous acute condition evinced by very low weight for height) in East Africa ranges from 5% to 6% (UNICEF, 2007). Wasting was considered in this study, and findings fell below national averages (Table 2).

Rates of malnutrition were lower around the lake than they were in the agricultural hinterland. This study also examined these communities (hinterland being defined as a band 25–35 km parallel to the lake shore). 45.3% of children sampled (using the same methodology described above) were stunted, compared to 40.2% on the lakeshores. More worrying, 7.3% were acutely malnourished, compared to 3.9% on the lakeshores ($n = 575$).

5.7% of mothers sampled at fish landing sites were chronically malnourished ($n = 649$). Rates were worst in Tanzania, where almost 8% of mothers sampled were chronically malnourished, and best in Uganda, where just 3% of mothers suffered from the same condition (Medard et al., 2002). The results of the survey of mothers' nutritional wellbeing are summarised in Table 3.

Interestingly, average malnutrition rates around the lake are lower than the national average in Kenya, where all of those studies that argue that there are direct causative links between the Nile perch export and malnutrition are based. In contrast, fishing communities in Uganda and Tanzania have higher rates of malnutrition than national averages.

Table 3
Nutritional status of mothers sampled during the LVFRP Nutrition Survey (Medard et al., 2002)

	Chronically undernourished	Well nourished
Kenya	6.3% (10)	93.8% (150)
Uganda	3.0% (7)	97.0% (229)
Tanzania	7.9% (20)	92.1% (233)
Totals	5.7% (37)	94.3% (612)

The divisive household

The underlying bonds that define households are multiple, and include love, social institutions (such as marriage), kinship relations, maternal/paternal relationships and so on. Importantly, households are also economic units. Depending on how they are organised and the relationships between members, households can be an economic drain on individuals or an economic security blanket. At the heart of household relationships lie efforts to minimise the former and maximise the latter. Potentially, household members can pool their resources for the benefit of all members. They may also be defined nutritionally, and this study viewed households as those units comprising members who shared their meals together.

Income systems

Of the 22 focus group discussions with Tanzanian and Ugandan men and women carried out for this study, 10 believed that the way in which income was made and distributed in the household was based on a 'secret and separate' strategy. Here, there is no income pooling or allowances between husbands and wives, who kept their incomes separate and secret from each other, in large measure to increase their relative bargaining positions when it came to making household decisions over labour and expenditures (Holboe-Ottesen and Wandel, 1991). Just two male focus groups believed that this was the way in which income was distributed within the household.

Of the 11 male focus groups interviewed, four felt that income was allocated on the basis of the expenditure concerned, with men assuming responsibility for some costs, while women were responsible for others. Three male focus group discussions said that allocations were discussed between men and their wives, but that the ultimate decision remained with the man.

Withholding economic information is a form of control and power, and can seriously affect income allocation in a household. Hence, for both men and women, keeping some or all of their income secret from their spouses was the best way of retaining control over their own money. On Lake Victoria (as elsewhere – see Dwyer and Bruce, 1988; Campbell, 1995), men did not typically reveal their incomes to women, but they did expect women to share all financial information with them.

While women may appear to gain more economic power by earning their own incomes, it is clear that in many communities this comes with a concomitant loss of bargaining power, and perhaps even the loss of one important, if sporadic, income base: husband's earnings. Many women therefore felt compelled to hide their earnings from their husbands, lest they withdraw *all* financial assistance to the household, regardless of how limited that was in the first place. If husbands did not know the full extent of women's income generation, women reasoned, they might then contribute more to household maintenance.

Spending priorities

Women at Kyabuyima, Bugoma and Kitobo landing sites claimed that most of the money men made was spent on themselves, paying for (other) women and alcohol. When evaluating their own expenditures, however, men claimed that they made substantial contributions towards household needs. At Katunguru, men put their personal spending at 5% of their total income, while the proportion of the income that women consigned to family expenditure was 20%. Women typically viewed children as their first or second greatest expense, while not a single male focus group identified children as a cost.

Despite these very divergent perceptions over expenditure, trends can be perceived. Both men and women interviewed agreed that if men did spend money on the household, it was typically for large, one-off payments, such as for health emergencies or school fees. Recurrent expenditures for food or other daily needs such as kerosene, were proportionately lower. Men, therefore, claimed to contribute sporadic support to the household, but did not actively engage in daily household maintenance (see Dwyer and Bruce, 1988 for similar spending priorities elsewhere in Africa).

Every focus group interviewed agreed that couples argued over money and expenses: indeed, mothers at Mihama, Kyabuyima and Bugoma said they argued over everything financial. While couples sometimes argued over what food to buy, or what kind of business to invest in, personal spending was the most hotly contested expenditure category. Like in other parts of East Africa, it was men's expenditures on beer and women that was often at the centre of these arguments.

Men's focus groups both validated and contradicted women's views on the subject. When told that the women's focus group claimed men spent a lot on beer, the men at Kemondo said that 'not too many' men spent extravagantly on beer. At Kitobo, the men interviewed said it was true that men boozed, pointing to a noisy beer hall nearby. They insisted, however, that these were unmarried men who had no children, and therefore had no household obligations. Those with families might have boozed, but they knew their limits. Men at Bugoma Beach, Uganda, claimed that they never left home to drink unless all was well domestically, while men at Nyamkazi said that when they went out to booze, their wives would tell them not to, and requested instead that they spent the money on food.

Clearly, men's and women's perceptions about appropriate levels of alcohol consumption and contributions to households incomes differed substantially. Despite women's protestations, it appeared that drinking was often the spending option that men finally decided upon. For many men too, spending money on other women was also an attractive spending option, a finding supported by other studies on Lake Victoria (cf. Pringle, 2005; Asowa-Okwe, 1989).

Budgeting and saving

The propensity for men to spend much of their income on items and activities disassociated with household well-being carries over into their ability to save their money. Women interviewed for this survey always budgeted – they felt they had no choice but to. As the women at Kyabuyima Beach, Uganda said, they were the ones who planned, innovated and struggled to maintain the household. Said one woman at Kitobo, 'Because of the problems women face with men, they know they must solve their own problems, so they save'. Women saved as groups, individually or both. Men were very rarely involved in savings groups. As one male respondent commented, "Men get much, and they spend much. Women get little but they budget".

Men often said they were living 'hand to mouth'. At Nkombe Beach, Uganda, fathers had difficulty drawing up an income and expenditure chart for themselves. They blamed their difficulties on the fact that they never budgeted, and had no idea how they spent their money. Reasons men gave for being unable to save included high rates of inflation, high product prices and a poor economy in general. Conversely, women were always able to save. At Nyamkazi Beach in Tanzania, men said that they could not budget and save because the economy was so poor, but also acknowledged that their wives did budget and save. It is probable that this dichotomy arises because men can invest their income in natural capital (the fishery); or, if insufficient, are confident that they will catch enough fish the following day to earn a little money. Women, however, do not have access to the fishery, and so invest in social capital, which includes any networks that increase trust, ability to work together, access to opportunities, and reciprocity; informal safety nets; and membership in organisations (Quisumbing, 2003b, p. 139).

The very underlying logic of the household is in many ways undermined by the above discussion. More than anything, the data collected suggest that households were a drain on men's incomes that they preferred to spend on beer, women or to re-invest back into the fishery that they controlled. Men did, however, often make small contributions to household maintenance, through, for example, bringing home fish from the lake, possibly paying for large expenditures, or investing in the house itself as an item of social prestige. It may be that residual traditional obligations to a household continue to influence the way in which men spend their money. It may also be that there were sound economic reasons for returning to households – the food was, after all, largely free of charge for them. Women who traded in fish retained a little for the household pot, tilled farms and harvested produce. Men, however, generally appeared keen to devise ways in which to avoid contributing money to the household. As a result, the onus of rearing and caring for children remained with women, and they were, therefore, responsible for finding incomes from beyond the household so as to sustain themselves and their families.

Men, women and incomes on Lake Victoria

If we accept that a large measure of a woman's powerlessness (and therefore, status) is derived from her limited control over resources, Lake Victoria's women are, from the outset, severely handicapped. There are very few women involved in the harvest of fish from this lake. While women are involved in the hauling of beach seines (from shore), and occasionally own fishing boats, these are isolated examples in a fishery where men's ownership of the means of production is almost as complete as their ownership of catches and the proceeds to be derived from these.

Gendered divisions of labour

It may be that women are excluded from the fishery because they find it too risky, or possibly too strenuous. More probably, men have secured and articulated traditional gender-defined roles to exclude women as a potential source of competition (cf. Madanda, 2003 for a deeper exploration of the cultural origins of gendered divisions of labour in Uganda's fishery). As a result, women within the fishery have been marginalised to less remunerative activities of little interest to men (see also Madanda, 2003). As mentioned above, as access into the fishery gets increasingly restricted, however, men too may seek incomes from fish trading and processing. Burdened by household duties and childcare responsibilities, women are typically unable to launch effective competitive strategies to protect or curb the influx of men into business sectors that they previously commanded.

These sexual divisions of labour permeate gender roles within households and responses to life and livelihoods around the lake. Within the home, women are in charge of cleaning the house and compound, preparing meals, looking after the children, and so on (Kalloch, 2000). Most women interviewed for this study also had obligations outside the home, including farming, fish processing/trading, shops or restaurants, hotel ownership, brewing beer or owning fishing boats.

Where men agreed that women's workloads were considerably larger than their own, they typically referred to women's domestic workloads. As one member of the men's focus group at Uganda's Nkombe Beach commented, "women work like donkeys. We men make them do a lot of work". Slack fishing periods (arising from poor weather, fishing seasons, lunar cycles and other factors) did not imply that men then turned to assist women with their household chores. Even when the fish export markets closed, men claimed not to make any great contribution to farming at home, or to lightening women's work burdens.

The focus groups interviewed for this study typically claimed that both men and women had equal control over their own labour, but that men could reap greater benefits from their time. As one man said, "[men's] time spent

working is very little, but they can make a lot of money. Women work all day and still men have more money".

Coping strategies

To cope with their labour and care burden, women devised a number of strategies to help ease their workload and/or provide more time with their children. The most frequent strategy was to choose income-generating activities that allowed them to merge their business activities with their domestic ones. Hence, women at Mihama set up small kiosks next to their homes to sell their produce, charcoal and fish. Women at Nyamkazi Beach sometimes brought their children along to their market. Fish processors at Kitobo purchased fish at the beach and then brought it home to smoke or dry.

Livelihood diversification is an important aspect of rural life around Lake Victoria, and was far more common amongst women than amongst men. In every community, fishing attracted almost all of a fisherman's labour and generated all of his income. In the event that respondents farmed, agricultural incomes only contributed about 10% towards fishermen's incomes. Even when the fishery was closed, there was no evidence to suggest that men sought to diversify into alternative economic sectors. Fishing will always yield at least a little cash every day.

Because men commanded the single most lucrative resource in the region, they had little incentive to diversify; women working on the periphery of this resource, with fewer opportunities and greater vulnerability, had to diversify. For women, incomes earned from a single sector alone were rarely sufficient to cover household, childcare and personal needs. Hence, they spread their capital and activities over several businesses, one of which might, at any one time, be profitable. Because of their need to remain close to home, however, their enormous domestic responsibilities, and various social pressures, their diversification options were limited, and comprised – essentially – of those tasks that men themselves were not prepared to do. As a result, competition between women in these sectors could be fierce, as is certainly the case in the fish trading and processing sector, where women may find themselves forced to offer sex as a way of securing the favour of a male fish suppliers (Appleton, 2000; Geheb, 1997).

As mentioned earlier, women often responded to these difficulties by forming savings groups. In these, women sought either to obtain sufficient financial reserves to work as a safety net against the vagaries of fish supplies, markets and the cash demands of men; or else to serve as a capital base from which investments could be made to make inroads into sectors traditionally dominated by men. The trick, in this latter case, was to make inroads in such a way that unwarranted male attention was not received until the investment was secure.

Despite such initiatives, women's business strategies faced serious constraints. At Bugoma Beach in Uganda, women argued that while they felt women had slightly

more access to, and equal control over, business, they felt men reaped far greater benefits from their businesses. Because men had more capital, more inputs and more strength, they could make more of whatever business they were in. Part of the difficulty in this respect was that women used their profits to care for their families, while men could reinvest theirs into their businesses. Men did not perceive these differences, and felt that the benefits that they and women derived from their separate business activities was equal.

Mothers at Nyamkazi ran an informal market on the beach, and their main customers were fishermen. When asked to rank the top three business opportunities open to them, women listed *pombe* (beer), banana and charcoal sales. *Pombe* was considered the best business because it was not perishable and sales were virtually guaranteed. Women at Katunguru and Bugoma also cited alcohol sales as an important income source. Indeed, *pombe* and alcohol distillation has always been a popular income-generating activity with women, just as, or perhaps because, it has always been a popular recreational activity for men (Green, 1999). Hence, in Ulaga in Tanzania, Green (1999) reports that, during the hunger season, “Poorer households buy what maize they can but otherwise eat bananas and root crops, while the men spend money on beer. Men say that beer is like food. It fills you up and stops hunger from hurting. From the perspective of the individual drinker this is, indeed, the case. Thick beer has a high calorific value and is quite nutritious...” (Green, 1999, p. 414). Howard (1994, p. 248) reports on earnings generated by Chagga women in Tanzania from beer sales: “...women’s ability to raise income from commercial beer brewing offsets their insecure access to their husband’s income from cash cropping and livestock sale, and their husband’s over consumption of beer and meat at the expense of his dependents”. On Lake Victoria in Tanzania, Appleton (2000, p. 23) reports that “In Kerebe harbour, the ‘boom town’ of perch-fishing, the beach was crowded with energetic fishermen. Their usual behaviour was to leap out of their boats, grab their pay, and make straight for the *pombe* (banana home-brew) bars until the next day’. By supplying the beer that they do not want their husbands to spend their money on, women’s command over beer brewing is, of course, profoundly ironic.

In this sense, there existed opportunities for women to capture at least some of fishermen’s incomes and the resources that they controlled. But this aspect of women’s lives is double edged, because their income-making opportunities become dependent on residual opportunities generated by an economy dominated and controlled by men.

It is important to emphasise how interconnected agriculture, the fishing industry and livelihood strategies are around the lake. Not only do many people employ multiple income-generating activities across the two strata, but the entire fish market can also be affected by agricultural trends, and *vice versa*. For instance, in the Tanzanian lake-side region of Bukoba, when coffee harvests come in, the

price of most consumer goods increases. Similarly, when catches are good, fishermen can spend their incomes on agricultural and other consumer produce. Hence, during one EU fish export ban, when fishermen were making very little money, the agricultural sector was deeply affected in several communities. At Kitobo, farmers explained that while there was plenty of produce available, no one had any money to buy it.

For many of the lakeshore’s inhabitants, the best strategy for coping during lean times was to reduce expenditure. Farming is not a perfect substitute for fishing. Whereas fishing income is readily available, farming takes time, and profits – both cash and in kind – are not available for use right away. For most, savings were obtained by reducing expenditures on food, which could mean tea without milk or sugar or dietary changes. Women at Nyamkazi cut food expenditures almost in half, while those at Bugoma reduced the number of meals they ate by half. The kinds of food served also changed. At Mihama, for example, women substituted more expensive types of fish and meat with *dagaa*, and relied heavily on vegetables.

The above discussion makes it clear that the commodity at the heart of livelihood wellbeing and sustainability on Lake Victoria’s shores is cash. Women and men never claimed to argue over fish or agricultural produce. For households dependent on the fishery, cash can be used to supplement meals with agricultural produce. It is, therefore, important to understand that the fact that men control much of the fishery, and supply almost all of the fish demanded by the fish export industry, has profound implications for the households and their members.

The impact of fish exports

If the wellbeing of Lake Victoria’s households depends on cash and the amount of cash in circulation, it then follows that if cash flows into this regional economy should slow, then households will suffer. On the lakeshores, it is the markets for fish that typically influence cash flows, rather than fish availability, and therefore it is the fish with the best market that attracts most attention.

The Nile perch is certainly the lake’s most valuable fish. As such, most fishermen target the perch (about 76% of catch on the lake target perch – LVFO, 2005), and Nile perch fishermen make the largest incomes. Fishermen dispose of their catch to a variety of outlets, including agents of fish companies and other middle-people and traders.

When asked about the impact of fish filleting factories on their economy, fishermen unanimously felt that factories had been good for their business. All groups said the factories expanded the fish market, providing better prices and guaranteed rapid sales, paid for in cash. Fishermen argued that many local markets – particularly rural ones – were unable to absorb the amounts of fish that the factories could. In addition, fishermen felt that factories offered better prices than they could get locally, which helped their economy.

Female processors at Nyamkazi, Mihama, and Kyabuyima all felt that factories were good for their businesses. At Nyamkazi, the processors felt that factories regulated the amount of fish on local markets, preventing a flood of fish that would depress prices and profit. Processors at Kyabuyima said that factories targeted certain types and sizes of fish, and that local processors targeted smaller sizes, remainders and *dagaa*, so they were not in direct competition with factories. They also added that when factories were buying, the price of fish went up, which they said was good for fishermen, and good for the community, as it increased cash income all round. Processors at Kemono, Kitobo and Nkombe felt that the export fish industry was bad for their business, though not necessarily bad for their families and their communities. Processors at Kemono felt it was hard for them to compete with factories for fish supplies. Before the factories came, they could buy large quantities of the freshest fish, but now they could not, and were often relegated to buying fish rejected by the factories for quality reasons.

Despite agreeing that men controlled the fishery, the infusion of cash into communities that fishing represented was important. Women pointed out that, for many of them, their businesses relied on fishermen, to whom they could sell goods and services, and in this way, indirectly ensure that men's incomes found their way into the household. As one respondent commented, "when there is no money coming from the lake, there is no business for women".

A multitude of business opportunities have grown as a result of the income generated by the Nile perch fishery. The 'boom towns' that have grown all along Lake Victoria's shores, often with populations of several thousand, support industries and activities that are often specifically fisheries-related, such as net mending services, boat and outboard engine repair, bait suppliers, restaurants, bars, boarding and brothels. All these myriad services and those that they employ depend on cash flows from the fishery.

Despite the income-making opportunities opened up by the Nile perch fishery, it remains inescapable that unacceptably high rates of malnutrition exist amongst the lakeshore's children. Throughout this survey, it was not so much the presence or absence of fish that determined whether or not it appeared on the dinner plate, but rather whether or not fishermen were prepared to share the proceeds from the day's catch with their families. Fishermen *choose* to sell their fish to fish factories. It is not commercial fishing and exporting that provokes such spending priorities. One way of demonstrating this is to consider what happens *in the absence* of the Nile perch export market.

The impact of export bans on Lake Victoria's fishing communities

Virtually everyone consulted during the course of this survey and others on the lake suggest that the Nile perch export trade has had a positive impact on lakeside commu-

nities, *especially* men. If, however, we ignore these postulations, and agree that the fish export trade is responsible for malnutrition amongst lakeshore communities, it follows that matters must improve at such times as when foreign markets close.

In Tanzania, an EU ban on fish from Lake Victoria occurred between 1998 and 1999. Fishing communities and factories could continue to fish and sell to local and international markets besides the EU. According to fishermen, the market for fish plummeted once the ban was instituted, which in turn decimated fishermen's incomes. Farming rarely offered respite because of the time to harvest. For families at every beach surveyed, the ban forced them to withdraw children from school, made it difficult to seek medical treatment, and reduced the amount of food families ate. As the fishermen at Kemono and Katunguru explained, there was plenty of fish to eat, but there was little money to buy other staple foods. With cash, women have more options with which to buy food. At least by trading with fishermen, they could secure some part of the lake's income. With the bans, however, fishermen had no such cash to spend.

Under the ban, there were many more fish on the local market, leading to a sharp decrease in the prices women could demand for their processed fish. In addition, many female fish processors were married to fishermen, many of whom were laid off with serious consequences for household livelihood security. As a result, for many families there was not enough money to buy food, pay for education and health. Health was thereby affected in two ways: first, families did not have enough money to buy sufficient food, and even though they had fish, the dearth of other options limited their food intake. Second, if anyone were to get sick during an export ban, many families could not afford to pay for medical treatment. Overall, the ban was deleterious and seriously affected the food security and livelihoods of Lake Victoria's households.

Between 1998 and 1999, a string of fish poisoning incidents – which occasionally poisoned and even killed human consumers – led officials to close the Ugandan section of the lake completely, leaving fishermen out of work, and fishing communities in turmoil. If anyone tried to work, the authorities confiscated their nets and/or outboard engines. The fishermen's income base was almost completely removed, as was that for farmers, who lost much of their consumer base. The poverty caused people to leave landings, which, in turn, had repercussions for shop owners, who lost their customers. Transport became problematic, as did sending children to school. While fishing communities claimed that they were able to eat fish during the ban, they were unhappy with their diet because they did not have enough money to buy other staples. At Kitobo, not all the fishermen returned to work once the ban was lifted; many had equipment confiscated, lost or damaged, and they did not have enough money to get back into the fishing business. At the Ugandan beach of Nkombe, this cessation of work led to food shortages, and forced fisher-

men to work on their farms to make money. They had no income, and their expenses changed dramatically. Necessities such as food, health and education were often out of reach.

For the mothers at Bugoma, the EU ban was disastrous. Their businesses failed because there was no fish, and therefore no consumers. There was no one to buy their beer. Many children could not go to school, and while health care was available, patients had to purchase it on credit. Personal spending was eliminated, spending on clothes was halved, and the number of meals eaten per day declined from two to one. There was no other work, and migrants left the community. Similar stories as these were derived from all the other PRA landings visited during the course of this survey.

Conclusions and policy implications

The Lake Victoria Fisheries Organization (LVFO) is based in Jinja, Uganda, and is an inter-governmental agency representing the lake's three riparian states with a view to managing the lake's fisheries. As with all common property resources, this is by no means an easy task, made all the more difficult given the high stakes represented by the Nile perch export markets. The mandate of the LVFO is as follows: "A common System/Resource Management [sic.] Among Contracting Parties in Matters Regarding Lake Victoria with the Goal of Restoring and Maintaining the Health of the Ecosystem and Assuring Sustainable Development to the Benefit of the Present and Future Generations" (LVFO, 2007b).

Curiously, the LVFO's website speaks very little about maximising benefits to fishing communities, while maintaining the sustainability of the fishery. Irrespective, as the organisation and its member states struggle to limit the number of people entering the fishery, the need to make the best use of the benefits to be derived from the fishery for the lake's riparian populations would appear to be a relevant policy focus.

Unacceptably high numbers of children surrounding Lake Victoria are malnourished. This would suggest that the lake's benefits are not being made the best use of. Because fish would not appear to be in short supply – particularly when export markets are closed – then the focus of attention must be on cash flows from the fishery and whether or not these translate into nutrients for children.

Malnutrition is unacceptable, particularly at the levels that we witnessed around the lake. Our contention is that this has more to do with the low status of women on the lake shores. We accept that the relationships between the fishermen and the fish filleting factories is highly unequal (as the anti-export proponents point out); based on our arguments above, we, however, believe that there is not a direct linear relationship between malnutrition on the lake-shores and the fish export. We believe that men control the fishery to the degree that women cannot, in most cases, benefit from it directly, and this has to do with long-time

traditions and cultural norms. "Community norms regarding the appropriate status for women may even be the greatest barriers to women's control over resources, especially independent rights to the resource" (Meinzen-Dick et al., 1997, p. 18). We believe that this forces women into peripheral positions vis-à-vis the fishery, but which are nevertheless dependent on the fishery and, indeed, the income spending whims of men. This latter point is important, because it means that when the Nile perch export markets are closed, women and children will also suffer. Because women are also much more vulnerable than men, they will suffer commensurately more. These disadvantages, we have shown, can translate into malnutrition amongst the children of the lake's fishing communities, via women's responsibilities as the primary care-givers for Lake Victoria's children.

While women adopt innovative ways of coping with these disadvantages, such as diversifying, and investing in social capital, these strategies are no match for access to the fisheries resource base.

The literature on the relationships between men and women in Africa is extensive, and largely supports the reasoning we employ in this paper (cf. Quisumbing, 2003a), as does literature focussing on these issues closer to the lake's shores (cf. Whyte and Kariuki, 1991; Francis, 1995). In this respect, it is surprising that anti-export proponents have not picked up on this extensive literature.

Improving the status of women vis-à-vis men is likely to improve the nutrition of children (Smith et al., 2003). Policy options can include targeting health care specifically at the lake's communities; policies that aim to improve women's access to the lake's fisheries; preferential credit systems for women to build up fishing capacity; and policies that can promote catch-up for women. If the role of the LVFO is to ensure that the benefits from this, Africa's largest inland fishery, translate into discernible positive impact on the ground, such policies do need to be considered.

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