

Lake Victoria: A Sick Giant

by Nancy Chege

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Lake Victoria was 'discovered' in 1858 by the British explorer John Speke, after months of braving dense forests and tropical diseases in his search for the source of the Nile. But now the Lake is in poor health, and the livelihood of the communities round it is threat-ened.

Nancy Chege, of the Worldwatch Institute, explains what has caused the trouble and what can be done to save the Lake.



If he could see Lake Victoria today, John Speke would probably stare in shock and disbelief. The once clear, life-filled lake is murky, smelly, and choking with algae.

The ecological health of Lake Victoria has been affected profoundly as a result of a rapidly growing population, clearance of natural vegetation along the shores, a booming fish-export industry, the disappearance of several fish species native to the lake, prolific growth of algae, and dumping of untreated effluent by several industries. Much of the damage is vast and irreversible. Traditional lifestyles of lakeshore communities have been disrupted and are crumbling. There is a consensus among scientists that if an accelerated push to save the lake is not made soon, this much-needed body of water will cease to sustain life.

Lake Victoria, shared by Kenya, Tanzania and Uganda, was named after the Queen of England and is the world's largest tropical lake and the second largest freshwater lake. Covering a total of 69,000 square kilometres, the lake is as large as Ireland, and lies in the Rift Valley of East Africa, a 3,500-mile system of deep cracks in the earth's crust running from the Red Sea south to Mozambique. Although this region of Africa is better known for its large cats and the herds of wildebeests, zebras and giraffes that roam the savannah plains, its most diverse and endangered ecosystems are to be found under water.



Early in the 20th century, a few decades after Speke's 'discovery', the colonialists started to exploit Lake Victoria's watershed. They cleared the surrounding natural vegetation, denuding forests and draining swamps, to plant cash crops, such as tea, coffee and sugar. Over the years, cash crop plantations have grown in size and number. Agricultural chemicals, applied on these plantations are washed into rivers during the rainy season, and end up in the lake, providing nutrients for unwanted, unsightly algal blooms.

The plantations attracted migrant workers who settled in the area. As the population grew and fishing methods advanced, overfishing became a problem and catch sizes began to drop. By the 1950s, popular species, such as ngege (*Oreochromis esculentus*), had diminished so severely that they had become commercially extinct. To remedy the situation, British officials introduced new fish in the lake's waters: the Nile tilapia (*Oreochromis niloticus*) and Nile perch (*Lates niloticus*). The new fish constituted only a minute percentage of the lake's fish biomass, while cichlids (small indigenous species) made up 80 per cent. Up until the late 1970s, the biomass composition of the lake remained relatively constant, but in 1980, a survey of the lake revealed an abrupt and unexpected change: a total reverse in biomass composition. Cichlid numbers had fallen drastically, comprising only 1 per cent of fish weight, while those of the Nile perch had suddenly jumped to constitute 80 per cent.

Cichlids are small bony fish whose mouth parts have evolved to suit their different eating patterns. Some feed on fish eggs, others on insects, while a majority prefer detritus. With the absence of

significant fish numbers to feed on detritus, the organic material decays, consuming oxygen as it sinks to the floor. Some areas of the lake, particularly the lowest levels, are depleted of oxygen and are thus inhabitable. They appear to be dead zones.

For decades, ecologists have travelled to Lake Victoria to study cichlids for their explosive evolutionary capabilities. In only some 14,000 years, as many as 400 species of cichlids evolved from 5 species of ancestors, making Lake Victoria one of the most species-diverse lakes in the world. **However, the number of cichlid species has now plunged to 200, thanks to the Nile perch. Loss of half the cichlid species has been termed as "the greatest vertebrate mass extinction in recorded history" by Les Kauffman, a chief scientist at Boston University. Commonly referred to as a voracious predator, the perch can grow to a hefty six-foot, 200-pound giant by feeding primarily on the smaller fish.**

Local fishermen are working harder and catching less; they are in a predicament. The populations of smaller fish, which traditionally have been their source of livelihood, have been decimated either by larger predators or by overfishing. The big, oily Nile perch, generally referred to as mbuta is too far out in the open waters for the little fishing boats, and too big to be caught in the unsophisticated nets.

However, although it is perceived as an ecological disaster by scientists, the introduction of the Nile perch is viewed as an economic booster by successful businessmen and powerful government officials. Hauled by the ton from the open lake by large, commercial boats, the fish are sold to nearby foreign-owned processing plants where they are rapidly cleaned, filleted, boxed and frozen, and sent off to prohibitively expensive restaurants in Nairobi and to the delicacy freezers of stores in the Middle East and Europe. The Nile perch has indeed become a money-spinner. Its hide is used to make belts and purses, while its bladder is sold to English alcohol-makers who use it as a filter and to Orientals who prepare soup stock with it.

In response to an increased, international demand for the Nile perch and other lake fish, commercial fishing fleets have not only displaced local fishermen but have also stripped many women in lakeside communities from one of their jobs. Processing of fish was traditionally performed by women, but has now been taken over by large filleting plants. The women have resorted to processing fish waste, commonly referred to as mgongo-wazi, 'bare-back' in Swahili. The waste, comprised of head, backbone, and tail, is sun-dried and then deep-fried and sold to local people drawn to its low price and nutritional value.

Situated not far from the processing plants is a whole range of industries, varying from textile and leather-tanning to paper mills and breweries. Most of these are in Tanzania and Kenya, and are notorious for discharging untreated effluent. **A recent study shows that on a daily basis, Tanzania is responsible for 2 million litres of untreated sewage and industrial waste that flow into the lake.** Although Kenya has rather strict pollution laws, these are rarely enforced because the industries have ties with foreign investors and the Government often has a significant stake in the polluting units. Moreover, it is considerably cheaper for the industries to pay an occasional 10,000 shillings fine (US\$220) than to install equipment to treat effluent at a cost of US\$2 million.

A more recent threat to the lake is the water hyacinth. With the deceptive appearance of a lush, green carpet, the hyacinth is a merciless, free-floating weed, reproducing rapidly and covering any uncovered territory. First noticed in 1989, the weed has already spread like wildfire, and has covered areas in all three countries. It forms a dense mat, blocking sunlight for organisms below, depleting the low concentrations of oxygen and trapping fishing boats and nets of all sizes. The hyacinth is an ideal habitat for snails that cause bilharzia and for snakes. **Scientists are desperately trying to control the weed: their most promising approach involves harvesting the hyacinth and using it either for compost or for biogas production.**

The health implications associated with the dilapidated state of the lake are extensive. Dumping untreated sewerage in the lake and nearby rivers exposes people to waterborne diseases, such as typhoid, cholera and diarrhoea. As fish prices soar beyond the common man's reach, protein malnutrition maybe a real threat. How ironic this would be, considering that over 200,000 tons of fish are exported from this region annually.

After the carnage in nearby Rwanda in May 1994, certain parts of the lake were considered disaster areas by the Ugandan Government, after thousands of bodies had floated into the lake via the Kagera river. Along the Ugandan-Tanzanian border, people fished out bodies that were not entangled by the hyacinth, to prevent an epidemic. During this crisis, the governments of all 3 countries were reported to be working closely to monitor the environmental situation.

Although the problems facing Lake Victoria may appear discouragingly complex and colossal, international and domestic efforts are under way to save the lake and curb its deterioration. In 1992, representatives of Kenya, Tanzania and Uganda formed the Lake Victoria Organization to co-ordinate rescue efforts. One of these efforts is aimed at the cichlids. To save these tiny fish from further extinction, researchers affiliated with local and foreign institutions are breeding 40 different species in aquaria in the United States and Europe under an IUCN (World Conservation Union) programme.

At the grassroots level, a Kenyan group of professors, researchers, and community leaders called

"Friends of Lake Victoria," or OSIENALA as abbreviated in the local Luo language, is working to protect the interests of local fishermen and to encourage aquaculture. In order to ease the demand that is affecting the size and diversity of Lake Victoria's fish stocks, OSIENALA is co-operating with local groups to educate the many millions of people who are dependent on the lake about the advantages of fish farming. Elsewhere in the region, aquaculture is already offering an important alternative source of protein and income.

Another promising development is the Lake Victoria Research Team, formed in the late 1980s as a result of studies by the US National Undersea Research Program in collaboration with local scientists. The studies revealed that below 30 metres, plants, animals and other organisms were dying because oxygen levels were too low. The Team, funded by a range of international bodies, including the National Science Foundation, the Canadian International Development Research Council and the Pew Foundation, was formed to intensify research efforts. They have discovered an abundance of a small shrimp, *Cardina nilotica*, in sections of the lake where the oxygen levels are too low for the Nile perch. In this habitat, the shrimp may have found refuge from the perch; and an increase in the number of snails. They have also found that populations of snail-eating fish have fallen drastically, a situation that could favour the spread of bilharzia.

Although the lake has been wantonly damaged over the years, it should not be allowed to die. Lake Victoria is invaluable to the many millions who depend on it for food, for employment and for recreation, and concerted efforts by the governments and local communities in all three countries is needed if matters are to be put right.