

Sandwatchers find **a market for a weed**

Water hyacinth has been a thorn in Kenya's side for decades. Capable of doubling its biomass in just 15 days, the weed has resisted all attempts to eliminate it from Lake Victoria, including those of the World Bank. Now, a group of Sandwatch Club members have come up with an ingenious solution. They are encouraging local entrepreneurs to use the robust weed to make a wide variety of products that include rope, bags, pulp, cards, lampshades, furniture, baskets, footwear, animal fodder and biogas.



The Kenyan branch of Sandwatch is based at Kisumu High School in the country's third-biggest city. Kisumu City lies on the shores of Lake Victoria, the second-largest freshwater lake in the world after Lake Superior on the US–Canadian border, shared by Kenya, Uganda and Tanzania.

For years, Kenyan Sandwatchers have cleaned and conserved the beaches and shores of the lake. Our job has become particularly difficult in recent years, however, as water hyacinth has reinvaded the lake.

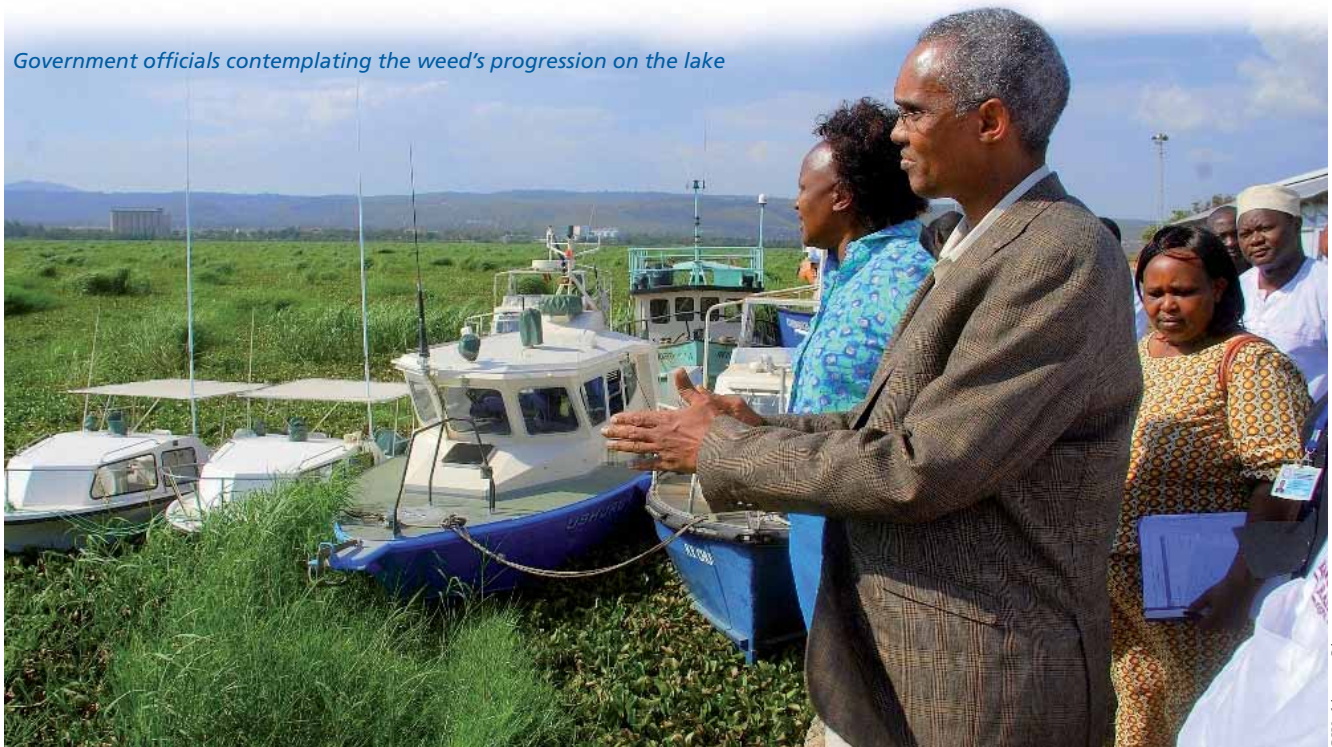
The weed is wreaking havoc with Kisumu's water supply systems, marine transport and fishing industry, and could ultimately threaten food security by blocking access to fishing grounds. As the vegetation mats block sunlight from penetrating into the lake, the weed also threatens plant and animal life. Moreover, by preventing water flow, it creates an ideal

breeding ground for mosquitoes and other insects. While there are other threats to the lake, such as overfishing and pollution, water hyacinth has been the hardest to eradicate.

A weed that keeps coming back

Known by its scientific name of *Eichhornia crassipes*, water hyacinth is believed to have been brought from the Amazon Basin to East Africa as a pot plant that later found its way into the lake. Its rapid proliferation has been blamed on the dumping of untreated industrial effluents and fertilizers in the lake. The green plant produces beautiful purple flowers and has long fibrous roots. The spongy tissues in its stem enable it to float in water. It grows in clusters that form floating mats in the lake and thrives best in polluted waters. The weed spreads at an alarming rate, doubling its biomass every 15 days according to scientists.

Government officials contemplating the weed's progression on the lake



Sandwatch adds climate change to the school menu

Sandwatch was launched in the Caribbean in 2001, during a UNESCO workshop on environmental education. Since its inception, Sandwatch has expanded into the Pacific and Indian Oceans and is now active in about 40 nations worldwide. Young people living on lakes or rivers have also become Sandwatchers, as in the case of the Kenyan club in Kisumu.

One of the most recent countries to join this UNESCO project is Kiribati in the Pacific. In March last year, the Curriculum Development Resource Centre of the Ministry of Education embarked on a revision of the primary school curriculum. This revision will integrate Sandwatch into four school subjects by the end of 2012: English language, Kiribati studies, mathematics and environmental studies. A revision of the secondary school curriculum is likely to follow.

The second edition of the *Sandwatch Manual* was launched in October 2010, after being tested in 2009 by teachers from the Bahamas, Dominican Republic, Puerto Rico and the Turks and Caicos Islands, at a Sandwatch workshop in the Bahamas.

Developed jointly by UNESCO, the Sandwatch Foundation and the Government of Denmark, the revised manual integrates topics related to climate change into the existing Sandwatch methodology. New topics include: how beaches respond to climate change; ways in which Sandwatch can contribute to climate change adaptation; simple ways to measure weather; beach erosion and sea-level rise; beaches and ocean acidification; climate change and beach users; coral bleaching; and enhancing beach resilience to climate change.

Other new sections of the manual cover monitoring beaches for nesting turtles and how to launch a Sandwatch project or create a Sandwatch network via websites, newsletters, social networks like Facebook and other free web-based resources.

This latest edition of the *Sandwatch Manual* is available from UNESCO in English and French, with Spanish and Portuguese editions due out later this year.

Download the manual: www.sandwatch.org;
or request copies: www.unesco.org/csi/field-offices

Some conservationists argue that the weed could be controlled by mechanical means but this approach has tended to fail because the weed grows so fast. Various herbicides are also effective but imperil wetland biodiversity. The continued presence of the weed in the lake causes water shortages, as the plants block irrigation canals and pipes carrying water into the city. Light steamers are often unable to dock at the port of Kisumu when it becomes clogged with the weed.

A plan to save the lake was launched in 1994, with funding from the World Bank and the Global Environment Facility, but it has unfortunately not made a lasting impact. Through the plan, *Neochitina* weevils were introduced into the lake to eat the plants but, by 2007, water hyacinth was back with a vengeance. According to NASA satellite imagery, the lake appeared to be clear by the end of 2005, until unusually heavy rains in November and December 2006 swept agricultural fertilizers and nutrient-rich sediment into the water, feeding a fresh outbreak.

The Sandwatch Club discovers the virtues of a weed

For the Sandwatch Club, enough was enough. ‘What can we do to stop this weed from spoiling our lives?’ asked Lillian at a club meeting in December 2008. ‘Nothing’, retorted Jacob with a sigh. ‘If the World Bank with all its money has failed, how can we, mere students with no income, achieve anything?’



The weed invades water collection points on Kisumu's shores.

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(Left) Sandwatch Club members harvesting water hyacinth in Kisumu to make rope (Above) Chair made from water hyacinth.

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But one member of the club refused to give up. Known affectionately as Wizard for his aptitude in browsing the Internet for ideas, he came across a group in South America who use the water hyacinth to make paper and boards. Since water hyacinth gives an easily digestible pulp, it serves as a readily available raw material for the manufacture of paper.

Using Internet, our group made a list of all the uses for water hyacinth they could find. We discovered that water hyacinth can be used as a food for humans because its leaves are rich in protein and vitamin A. It can be used as a green fertilizer and as mulch and compost to regenerate degraded soils. It can remove different pollutants from water and nourish fish populations in the wild or in artificial enclosures. It can easily replace straw as a substrate for mushroom-growing or serve as animal fodder. It can be used as a source of energy by burning the weed to produce biogas, thereby combating deforestation. The plant can also be used to make fuel briquettes for cooking and lighting.

Since our club lacked the money to invest in harvesting the weed for commercial purposes, we decided that the best thing would be to encourage youth groups, women's groups and groups for the handicapped to form community-based organizations to harvest and process water hyacinth and manufacture a variety of exotic products. We suggested to them that they could capitalize on the hyacinth's tough but flexible composition by weaving baskets, chairs and other pieces of furniture – even biodegradable sanitary napkins – to sell for extra income.

Several of the groups took our club's advice. Now, all over Kisumu, markets and shops sell a variety of products made from water hyacinth. 'Even my current diary is made of water hyacinth paper!', observes club member Mark. Other products on sale in the city include pulp, cards, lampshades, sturdy furniture, baskets, footwear, cordage, animal fodder and gas.



Furniture can be made from the water hyacinth's dried fibres, like this coach seat with a back rest.

© Washington Ojwang

We have been amazed by the creativity of people. 'Recently, we visited a hotel near the lake where they use water hyacinth as a substitute for tea and coffee', says club member Timothy. 'It tasted...wow!'

Twice a month, Sandwatch Club members harvest the weed manually from the lake to make rope. This rope is then used to tie up domesticated animals like cows, goats and sheep. 'We are helping farmers and fishermen around the lake shores not only to improve their income and

livelihood but also to make at least a small difference to their local surroundings,' says Timothy. 'People are turning a devastating situation into a life-improving one.'

The Sandwatch Club is now trying to convince the population that, while water hyacinth may be viewed by many living on the shores of Lake Victoria as a menace that must be removed, it also has its merits. That is our club's new message', he says, 'water hyacinth is a double-edged sword.'

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