Water Hyacinth, an Invasive Plant in the Lake Tanganyika Basin

What is an invasive species?

An invasive species is an animal or plant which is introduced into a new area where it does not occur naturally. If the introduction occurs without the accompaniment of its pests and diseases that keep the species in check (under control) in its natural range and if it is able to survive, establish and spread thus causing damage to biodiversity, peoples' livelihoods or development, it is called “invasive”. Water hyacinth, sometimes called the World’s Worst Water Weed, is becoming invasive in the Lake Tanganyika basin and on the shores and wetlands of some parts of the lake.

Water hyacinth (Eichhornia crassipes) is an exotic free-floating aquatic plant from the Amazon River basin in tropical South America. The dark green, shiny leaves have expanded hollow stems (petioles) that enhance its ability to float and can extend to 2 m above the water level. Below the water surface, there are root-like structures (rhizoids) which balance the plant and keep its aerial parts upright while taking up water and some nutrients. It reproduces through flowers and seeds (which can remain viable for up to 15 or more years) and has vegetative propagation by its stolons which are lateral extensions from the main plant which produce new plants which eventually leave the "mother plant".
Impacts of water hyacinth

- *Eichhornia crassipes* can form dense floating mats that cover large areas of water surface - thus excluding light, and air. This then affects animals (including fish) and plants that live and grow below the water surface; the area of a water hyacinth mat can double over several days when conditions of water and temperature are optimal;
- The floating water hyacinth mats can have serious mechanical impacts on water supply systems, drainage canals, inflows to hydropower turbines, movement of ships and river flows;
- Water hyacinth increases evapotranspiration well above that of open water (often over 3 times “open pan” evaporation) thus causing significant water loss to dams, reservoirs and wild waters;
- The crowding of plants at edges of water bodies can prevent people’s access to the water for domestic use, fishing and transport, and can, at the same time, make the water unsuitable for human use;
- The mats provide habitats for intermediate hosts of human diseases such as bilharzia-carrying water snails and larvae and pupae of malaria-spreading mosquitoes;
- The floating plants and the mats they produce can also provide habitats for dangerous animals (snakes, crocodiles) and can support other aquatic plants that then form “floating islands” that can block water flows and damage machinery - such as hydropower turbines.

It’s presence in the Lake Tanganyika ecosystem

Water hyacinth is present and invasive in wetlands and swampy shorelines around Bujumbura and other parts of the Burundi shoreline. This is a recent invasion which entered the lake in the late 1990s and has spread widely – to the detriment of other aquatic plants, fish, other aquatic animals and people. We do not have records of lake-side invasions in the other riparian countries of the lake (DRC, Tanzania and Zambia) but are aware that this water weed is present in other parts and catchments of all three countries – and in upland wetlands and lakes in Burundi as well as in Rwanda. *Eichhornia crassipes* is quite able to spread across the lake and establish in suitable sites – but does not seem to have done so – YET.

How does it spread?

Water hyacinth came to the lake from infestations upstream in the Rusizi River and from “water gardens” where the plant was growing in cities and towns near the lake – where it was kept for its attractive foliage and beautiful flowers. Once it is established in a wetland or water body it can spread through wind propulsion of floating plants (or plant fragments), through water currents and on the feathers and feet of the numerous species of local and migratory waterbirds. In other countries in Africa it has been spread by people – as a green cover for dams and other water supplies; and as packaging for fresh fish on their way to far-off markets.

How can it be controlled?

- Mechanical control can be effective (in the short-term), using manpower and machines. However, this has to be repeated frequently because once the plants flower, seeds accumulate in the substrate and can then germinate from the seed bank – sometimes several times a year for many, many years;
- Herbicides have been used and can be effective, but there is always concern for effects on non-target aquatic biodiversity and peoples’ use of the waters; and poisoning does not affect the seed bank which will replace the poisoned plants within months;
- Biological control is the most effective, affordable and self-sustaining means of management and some very effective agents (insects) have been used effectively in many large and small water bodies across Africa;
- Integrated control where two or more of the above methods are combined to manage the plant to reduce its impacts and stop its spread;
- Water hyacinth requires some dissolved nutrients in its waters to grow and spread. Thus effective control of water pollution from agricultural run-off, rural and urban drainage and insufficiently treated sewage should be maintained to ensure that if there is a first infestation, it is unable to grow into a significant water hyacinth invasion.

What is my role in controlling this invasive species and so retaining the benefits of Lake Tanganyika?

- Ensure that any effluents that are released into the lake or its tributaries are treated first to avoid providing nutrients to the water hyacinth plants;
- Discourage or ban the sale of water hyacinth plants for decoration and the sale of its flowers which can easily spread seeds and encourage private growing of the plants;
- After clearing the invading plants from urban areas, do not dispose of the debris on the river banks or lake shore because decomposition that follows will release nutrients that will then flow back into the water; also plant fragments from such clearing can regrow if they reach the water. If possible transport all waste flow back into the water; also plant fragments from such clearing can regrow if they reach the water. If possible transport all waste from the clearance site and burn the debris elsewhere;
- If any new infestations are noticed, please inform the relevant authorities or LTA;
- It is inadvisable to make any economic use of cleared plants of water hyacinth as this is likely to give this plant economic value and so stop its control and management. If utilisation is desirable or congruent with current national policy then carry this out in drainage basins far from Lake Tanganyika.