

# CONVERTING WATER HYACINTH INTO BIODEGRADABLE PLASTIC HELPING ERADICATE AN INVASIVE SPECIES IN KENYA

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Joseph Nguthiru [founded the Kenyan startup HyaPak](#), which produces biodegradable packaging from the pulp of water hyacinths, an invasive weed that covers much of Kenya's Lake Naivasha. HyaPak converts water hyacinth into biodegradable alternatives to single-use plastic products, reducing waste whilst helping eradicate an invasive species.



The products created by the HyaPak enterprise include seedling bags that decompose directly into the soil, parcel packaging for courier services and carton linings that keep food fresh without cold storage.

Water hyacinth wreaks havoc in over 70 countries, blocking waterways and causing significant economic loss. HyaPak's innovative solution uses this weed to create products like the successful biodegradable seedling wrappers, which decompose in six months. This enterprise simultaneously addresses the environmental challenges related to deforestation, helping solve the great problem posed by invasive species and finding alternatives to single-use plastic products by recycling the great amount of waste produced in the country.

To date, HyaPak has restored 20 hectares by recycling the water hyacinth in Lake Naivasha, planting 30,000 seedlings across Kenya and creating 45 green jobs for community members whose livelihoods have been impacted by the plant. By turning an environmental menace into a resource, HyaPak is restoring ecosystems, reducing plastic waste and offering circular economy solutions with global potential.

[Water hyacinths are native to South America](#), but were introduced as an exotic ornamental to many other countries. They've since taken over freshwater environments and are labeled an alien invasive species on every other continent aside from Antarctica. As well as their impact on biodiversity and livelihoods, the floating plant can clog hydroelectric and irrigation systems, meaning that one does not need to live in their proximity to be affected. It's the highest-profile example of an invasive aquatic plant crisis that has cost the global economy tens of billions of dollars historically, and now [more than \\$700 million annually](#).

One project that helped HyaPak grow is its partnership with the Kenyan government to use seedling bags produced by the company as part of a flagship reforestation scheme. [According to Global](#)



[Forest Watch](#), Kenya lost 14% of its tree cover between 2001 and 2023 and in 2022 Kenya's Forestry and Land Restoration Acceleration Program committed to planting 15 billion seedlings by 2032 on degraded forest and rangeland. Doing so would bring the nation's tree coverage to over 30 percent. All those seedlings need bags in which to grow and be transported and HyaPak's seedling bags were part of the plan. A plastic-based seedling bag has a carbon footprint of 1.6-1.7 kilograms, and it is disposed of when the seedling is planted. HyaPak provided the government restoration program with biodegradable seedling pots and bags which decompose in six months to replace the conventional plastic ones. HyaPak's bags are planted with the seedling and biodegrade, releasing nutrients including nitrogen. What's more, during the seedling's first months, the bioplastic slows water seeping into the surrounding soil, reducing the amount of watering required. This solution reduces pollution, increases efficiency in the seedling process, and eliminates the transplant shock that previously occurred.

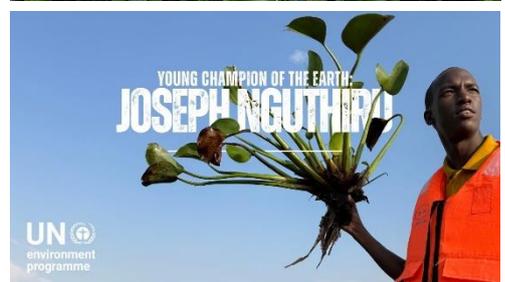
[The HyaPak website underlines](#) that the biodegradable seedling bags promote healthy seedling growth, decompose naturally in just six months, and contribute to a circular economy. Each HyaPak seedling wrapper eliminates the need for traditional plastic, collectively reducing tons of plastic waste from entering the environment. In particular the seedling bag provides the following benefits:

- 10 Increased growth rate due to the nutrients in their hyacinth seedling bags.
- 1.6 kg of carbon offset per seedling wrapper.
- 20 Increased water retention due to reduced water used during irrigation.

The website also describes the steps of the process to transform a weed into biodegradable plastic:

- **Harvesting:** They take great care in sourcing water hyacinth with the help of the affected fishermen and community members.
- **Drying:** This involves ensuring that the water hyacinth is dried and crushed thoroughly to the highest quality to meet their standards before proceeding with the conversion process.
- **Development:** Through a meticulous extraction process, they obtain the fibers from water hyacinth, which are converted into biodegradable alternatives.
- **Conversion:** Using innovative techniques, and patented processes, they convert the extracted fibers into biodegradable alternatives for single-use plastic products.
- **Quality Control:** After molding, their production process ensures the creation of eco-friendly products that biodegrade within 3 to 6 months, but with a possibility to extend to 12 months or slightly more depending on the intended use case.

HyaPak has been recognized in 2023 for best innovation in Nature, Food, and Water systems by the Prototypes for Humanity Award at COP28. HyaPak has also been recognized as the best innovation in Kenya by the East Africa Community, and is listed by Yale Africa Startup Review as part of the Top 30 startups in Africa. Joseph Nguthiru was also selected for the 2023 Obama Foundation Africa Leaders Program. [Joseph Nguthiru was one of the winners of the UNEP 2025 Champions of the Earth Award](#) organized by the United Nations Environment Programme to annually recognize young people from around the world with outstanding ideas to protect and restore the environment.



[Aware of its versatility, HyaPak is committed to creating environmental, technical, and social impact worldwide](#) beyond Africa. Currently, they are also discussing collaborations in Mexico, Nigeria, India, and El Salvador to replicate their model. Moreover, the company continues seeking partnerships with governments, scale-up partners, R&D organizations, distributors and food packaging companies. HyaPak is an example of how a problem can become an opportunity addressing global issues as reducing the impact of the water hyacinth invasive plant and plastic pollution.

### To know more

[HyaPak website](#)

[HyaPak website -About us](#)

[HyaPak in Facebook](#)

[JUNEP Article - Joseph Nguthiru winner 2025 Champions of the Earth Award](#)

[Prototypes for humanity.com](#)

[Article in cnn.com](#)

[Article in plasticsengeenering.org](#)

[Article in triplepundit.com](#)

[Article in ethicalbusiness.africa](#)

[Article in rpra.ca](#)

[Article in Obama.org website](#)

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