

Climate Action

David Monday has successfully transformed plastic waste into eco-friendly building materials by constructing permanent homes for homeless people living in rural areas, refugee settlements and people affected by disasters.

BY DAVID WALUGEMBE

From overflowing plastic waste in the drainage channels to hills of uncollected garbage, waste has quietly become one of the country's most dangerous crises, leading to public health issues, polluting ecosystems, and, increasingly, costing lives.

For example, on August 10, 2024, a tragedy befell the residents of Kiteezi, Kawempe Division, Kampala after a landfill collapsed under its own weight, killing at least 34 people, coupled with the burying of livestock and houses, according to police.

The National Population and Housing Census (NPHC) 2024 report indicates that 92 percent of Uganda's population dispose of waste improperly, with only eight percent having access to basic municipal solid waste collection services.

To drive for change, at the heart of Mayembe Upper Hill, Mpigi District, approximately 40 kilometres from Kampala City Centre, a striking landscape, rising rows of permanent houses built not from bricks but from discarded plastic bottles.

These eco-friendly homes are the brainchild of David Monday, the proprietor of Pendeza Shelters, who turned his personal tragedy into purpose, collecting bottles from surrounding communities of Mpigi, Wakiso, and Kampala.

In 2007, Monday lost his brother Amos Atholere, 10, in floods caused by plastic waste blocking natural water channels in Kasese District. The tragedy never left him the same.

"If it weren't for the plastic waste... my brother wouldn't have died," he recalls.

Determined to ensure no family suffers a similar fate, Monday vowed to fight plastic pollution not just by cleaning it but by giving it value.

"Today, he constructs durable, affordable homes using compacted plastic bottles filled with soil, creating structures that can last over 400 years."

When *Daily Monitor* visited the 'plastic paradise' in Mpigi, the experience was unforgettable; the houses stood like an ecstasy of innovation, cool, quiet, and uniquely beautiful. The fresh air inside was striking, a sharp contrast to the congestion of Kampala.

Plastic-bottled houses idea incubation

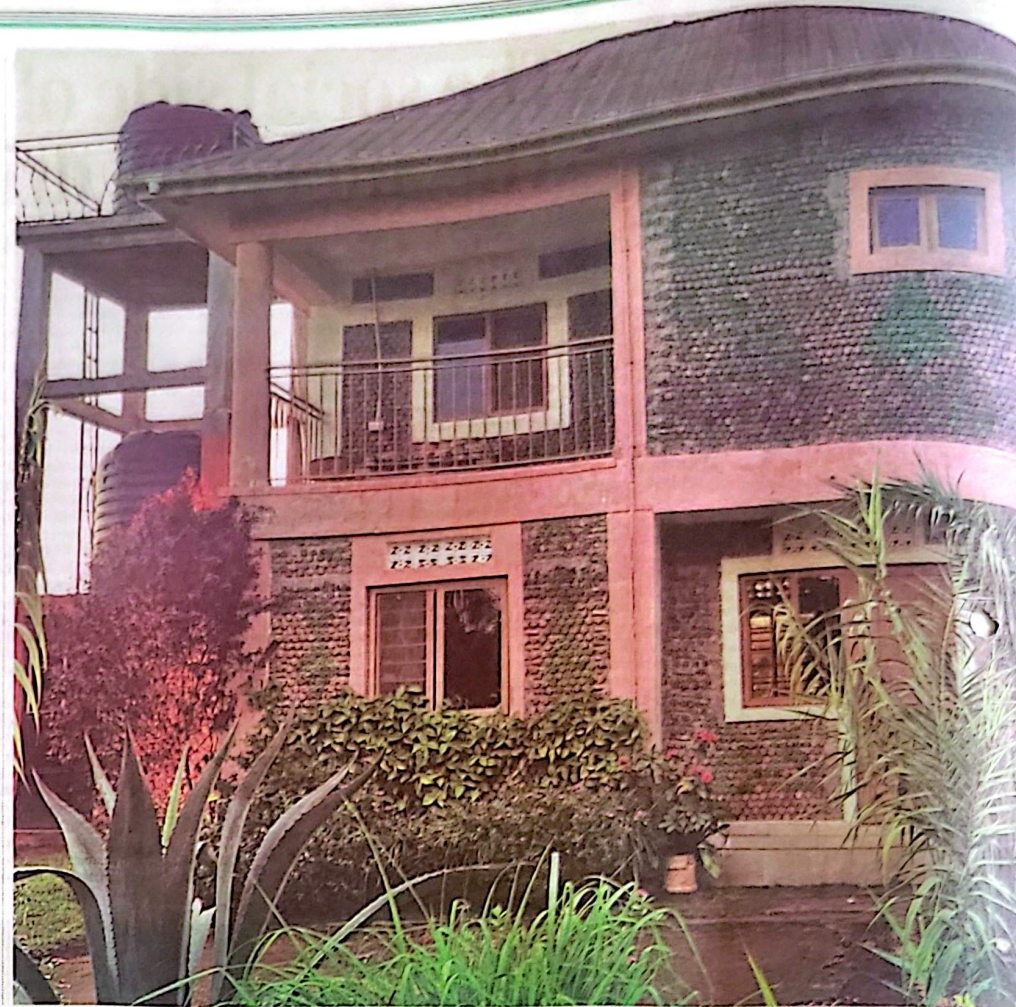
Seven years after his brother's death, as Monday looked for opportunities, he shared his brother's death story with the Social Innovation Academy (SINA) for an environmental protection Grant.

His proposal was accepted. But then, the IT fresh graduate states, he was asked to specify how he could transform plastic waste into something useful.

"I said I did not know; they told me to do research. I found out that in Cameroon and Nepal, they had built houses out of plastic," Monday recounts.

Using his IT skills, Monday formed a group of three people and started extensive research on how to transform plastic waste into building eco-friendly

A double-storey house built using plastic bottles. Constructed from 2019 to 2021, the house in Mpigi District cost about Shs95 million. PHOTOS/DAVID WALUGEMBE



How Monday is turning plastic waste into long-lasting houses

ly houses.

After the research, they tested filling bottles with soil to make them hard, reasoning that soil lasts long, is fire-proof, and cannot be easily destroyed.

They constructed the first house in 2014, using compacted-soil bottles held together by cement and sand (mortar).

"Our first house was not perfectly constructed since it was our first project everything was just by discovery. When we reached the wall plate level, it was not balanced, so we were prompted to use pillars to ensure that the roof sat on well," he explains.

The construct breakdown

The foundation is built using stones to lay a firm support, the floor is covered by either eggshells or tiles. There's also the alternative of cementing it. Car tyres, grass, ceramics or iron sheets com-

plete the roofing stage. The walls are constructed using purely bottles joined together using mortar.

"We use spirit levels (a tool used to accurately align surfaces and objects horizontally or vertically) instead of plumb bobs (a weighted, tapered tool suspended by a string to establish a precise vertical reference line) because bottles take time to settle, since plastic doesn't absorb water," he explains.

Reinforced with iron bars and concrete, a plastic bottle house has an average lifespan of about 420 years, he says.

A sizeable house requires, on average, 30,000 bottles.

"We employ, on average, about 120 people, ranging from bottle collection and sorting to bottle soil filling and construction," he says.

"I have so far constructed 64 houses since 2014 in different countries such as



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David Monday, the proprietor of Pendeza Shelters



David Monday on a site. His firm constructed the first plastic bottle house in 2014.

Another plastic house owner, Roselline Ryokot, notes that they are rarely attacked by termites and other insects, which makes the house clean.

Ryokot, who has owned her house since 2022, further notes that the houses are fire-resistant since bottles are filled with soil.

"One factor often overlooked is that these houses attract tourists as curious people come around to find out about the uniqueness of these houses."

Environmental policy gaps

Constatine Aporo, an environmentalist, urges the government to strengthen environmental policies and enforcement to ensure that businesses adopt responsible production and packaging practices, and that citizens must take responsibility for reducing and managing plastic waste.

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Aporo says Uganda's fertile soils, forests, and magnificent lakes can no longer survive due to mountains of plastic waste, urging people to reduce plastic consumption by using reusable

ATTITUDE TOWARDS BOTTLE HOUSES

Despite their strength, affordability, and environmental benefits, perception remains a barrier. "Many people think that such houses will collapse anytime, catch fire, and are of low quality, which makes it difficult for us to convince people that these houses are better," Brain Muvunye, a site supervisor laments. He adds that they also face high costs of operation, transportation of material to sites, and low technology, hence low production.

bags, bottles, and containers for clean communities.

"Rivers, wetlands, and lakes—including those connected to Lake Victoria—are increasingly polluted by plastic bottles, bags, and packaging. In aquatic environments, animals often mistake plastic for food, which can lead to injury, starvation, or death. We need interventions," he proposes.

He decries that many areas have limited waste management systems, which prompts people to resort to plastic waste burning, releasing toxic chemicals into the air, contributing to air pollution and respiratory health risks.

Raymond James Ntabazi, the Project Coordinator for Zero Waste Cities at the Green Africa Youth Organization (GAYO)-Uganda, notes that there is inadequate climate financing and weak im-

plementation of policies, limiting the progress of environmental protection.

Ntabazi further asked the government to prioritise youth inclusion in climate and strengthen the enforcement of environmental laws like wetland protection, deforestation, and waste management.

"Policies must move beyond paper to action. Uganda has strong climate policies, but implementation remains a challenge," he states, adding that there is also a need to invest in climate education and green skills development, especially for young people, to create employment through green jobs.

Waste management crisis

Garbage is one of the key challenges affecting Uganda.

According to the Uganda Bureau of Statistics (UBOS) report on the rapid municipal solid waste management assessment report 2024, Kampala City generates 2,500 tonnes of garbage daily, but only 1,250 tonnes (50 percent) are safely collected and disposed of, leaving the city with half of the garbage generated uncollected.

Other cities, such as Lira City, generate 1,200 tonnes daily, but only 65 percent is collected; Mbale City, 90 tonnes, but 30 percent collected and Arua City, with the lowest collection rate of only 3 percent of the 50 tonnes of waste generated among other cities.

According to the World Bank's new "What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050" report, without urgent action, global waste will increase by 70 percent by 2050, from 2.01 billion tonnes in 2016 to 3.4 billion tonnes.

The report further indicates that plastics are especially problematic; if not collected and managed, they will contaminate and affect waterways and ecosystems for thousands of years. In 2016, the world generated 242 million tonnes of plastic waste, 12 percent of all solid waste.

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Zimbabwe, Kenya, Nigeria, South Africa, and Congo," he explains.

Among the completed projects is a magnificent two-storey house in Mpigi. Constructed from 2019 to 2021, the four-bedroom house cost about Shs95 million.

When asked about how much a two-bedroom house would cost, Monday estimated about Shs18 to Shs25 million, depending on site location.

Todate, Monday estimates that the initiative has created about 500 jobs, trained 305 youths and women, collected 2,240,000 bottles, and increased youth and women's income by 30 percent.

Users' experience

Lilian Namatovu, one of the owners of plastic bottle houses at Ngejja Women's Foundation, Mpigi, notes that the plastic-bottled houses hardly crack and damage, enabling them to save money on maintenance.

Namatovu emphasises that they are also environmentally friendly, as they alternate temperatures in accordance with the season, which is not common with ordinary houses.

"For us, we do not suffer from the cold, norially during the rainy season. We

