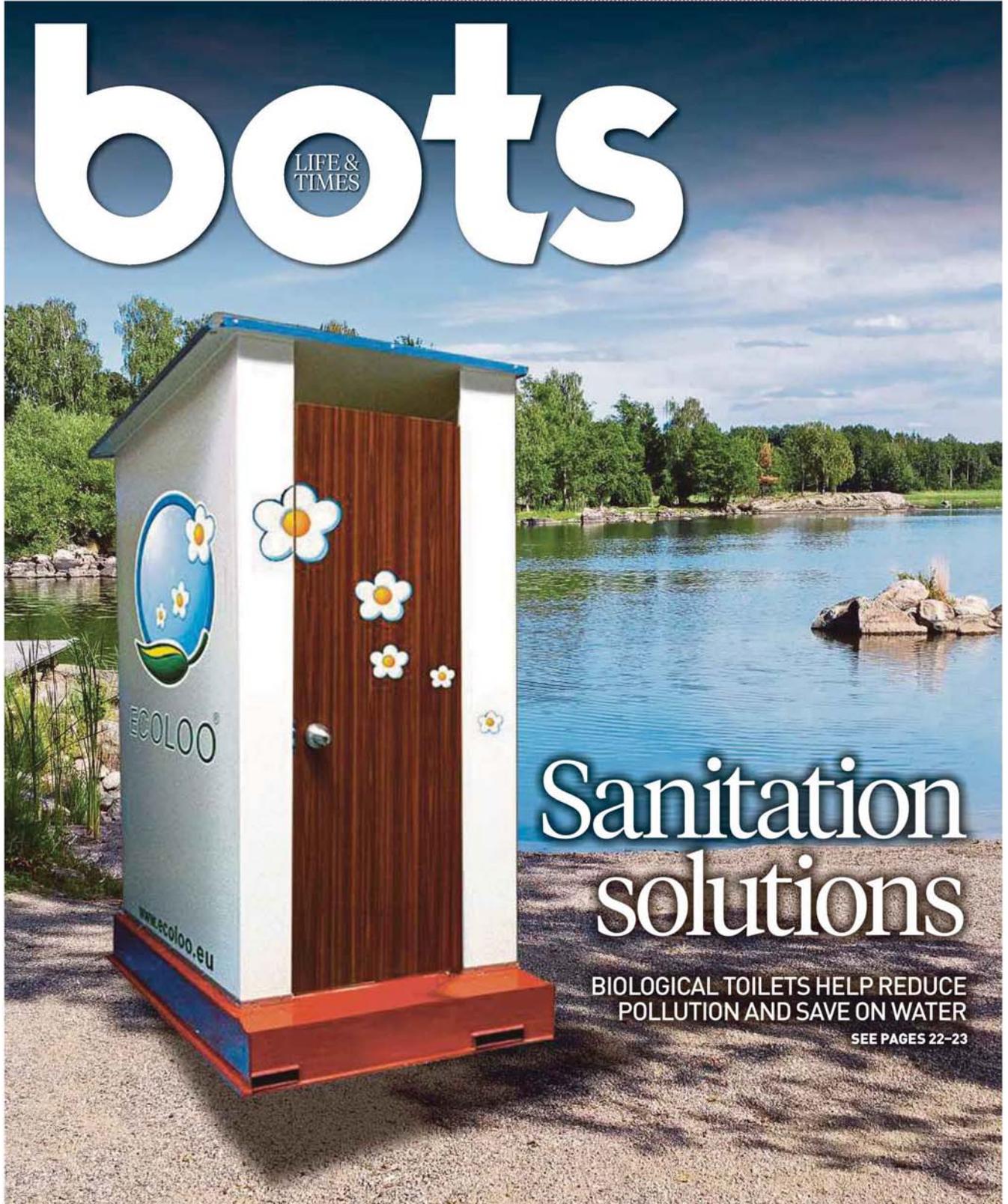


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Zuraina (right) receiving the Best Public Sector Project Award for Environmental Management in the Islamic World 2017 by Kingdom of Saudi Arabia.



FROM TOP: Zuraina (right) presenting EcoLoo with Imad Agi at a conference organised by Mercy Mission Malaysia in 2016.

Towards self-sustainable toilets

Toilets which use a specially formulated bacterial culture to treat human waste will improve sanitation for the less fortunate, writes **Balqis Lim**

WE visit the restroom several times a day. However, have you ever wondered about the technology behind it, about how much water is used to make it all work?

A person uses four to eight litres of water per flush. To put this in perspective, Malaysians, on average, consume 260 litres of water daily per person.

Social entrepreneur Zuraina Zaharin says that we use a lot when compared to some countries, where they don't even have sufficient water to drink, let alone for flushing.

From her research, she found that 2.5 billion people have no access to proper toilets. This has led to a rise in the death toll caused by bacterial diseases, due to poor sanitation.

"In most resorts around the world, sewage contaminates beaches with viruses, parasites and bacteria. They are by far the largest polluters of oceans and seas. The pollutants become food for fish that end up on your plate."

To counter this problem, Zuraina has come up with a solution, a self-sustainable toilet called EcoLoo. It addresses the

issues of inefficiency and decentralised waste treatment.

Her company, EcoLoo Greentech Malaysia, which was founded in 2013, specialises in sustainable sanitation solutions and other green innovations.

GREEN BACKGROUND

Zuraina started her career as an analyst in the banking and broadcasting industry. In 2003, due to her company restructuring, she had to leave.

During this downturn in her life, she headed for the mountains to connect with nature.

Zuraina began climbing mountains, including Mount Kinabalu in Sabah, and several others around the world.

"Through this connection with nature, I became very concerned about the environment. I was also involved with the Malaysian Association of Professional Speakers (MAPS) where I gave talks to inspire others.

"During my climbs, I experienced situations where there were no toilets or the pit latrines were in terrible condition. I also saw rivers which were turning brown, and at times, almost black from pollution," says Zuraina.

At a forum in Sweden in 2012, she met the EcoLoo inventor (now her business partner), Imad Agi, who introduced her to his sustainable toilet.

The state-of-the-art innovation was developed through research and development since 2008 in Sweden for both hot and extreme cold weather (as low as -30° Celsius).

The first biological toilet was manually built in Stromstad right next to a beautiful lake visited by many tourists during summer.

The municipality purchased EcoLoo to protect the lake from being contaminated as its water is clean, even drinkable. Until

today, the toilets are being used, with the waste collected from the toilet used to fertilise the surrounding gardens.

With Zuraina's partnership, EcoLoo started producing sustainable toilets in South Korea from 2013. Its production facility was moved to Malaysia in 2015.

THE INNOVATION

EcoLoo is a standalone, decentralised toilet system comprising a two-tier box. It uses a special formulated bacterial culture to treat human waste and transform it into natural fertiliser.

Via a mechanical waste cover, it is designed in such a way to hide the view of

HOW ECOLOO TOILET WORKS



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EcoLoo toilets installed at high altitude areas in Petra, Jordan.



EcoLoo is a stand-alone, decentralised toilet system that is made of a two-tier box and uses a specially formulated bacterial culture to treat human waste and transform it into natural fertiliser.

polluting poor residential areas.

EcoLoo toilets do not only reduce the mass of waste deposited but converts them into liquid fertiliser for use in farms. The innovation makes it possible to reduce environmental pollution and limit water wastage contrary to normal water cistern toilets used in homes and buildings.

"Portable plastic toilets usually have a usage limit of up to 70 people or until the tank is full, and it will be shut down. But EcoLoo can be used by up to 200 people per day (assuming 12 persons per hour are using it).

"It might be pricier but in the long run, the savings are substantial. You also get fertilisers which can be sold for money," says Zuraina.

She emphasises that EcoLoo's goal is not only to be a profitable business but an effective, long-term and sustainable one that can create jobs and business opportunities from the production, distribution and collection of the organic fertiliser generated in the system.

"What was once considered bad is now being transformed into something which is economically viable. We strongly believe that our sustainable solutions will also solve the world's pressing issues related to water, sanitation, hygiene and the environment," she says.

EcoLoo is an award-winning biological toilet treatment system that was recognised as one of the Top 10 Global Innovators for Global Challenges at Solutions Summit 2016 by United Nations in New York with a global presence in 21 countries across five continents.

Among the awards received are Impact Driven Enterprise Accreditation (IDEA) 2017 by Malaysian Global Innovation and Creativity Centre, Mercy Mission Stewardship 2016 Award by Mercy Mission Malaysia, and Best Public Sector Project Award for Environmental Management in the Islamic World 2017 by Saudi Arabia.

Zuraina says some successful projects that EcoLoo has been involved in include the one with UNDP Jordan, completed in February 2016 where the company installed toilets at high-altitude areas in Dibbin and Petra, a Unesco World Heritage site, and at deserted areas in Wadi Rum, Jordan.

EcoLoo has not been marketed extensively in Malaysia but some of its toilets have been installed in Universiti Malaysia Terengganu's floating lab at Kenyir Lake, off-grid housing areas in Kuala Lumpur and during the SEA Games Kuala Lumpur 2017, among others.

FUTURE PLANS

In making this planet a better place to live in for the next generation, EcoLoo welcomes partnerships with social business partners, corporate social responsibility companies, non-profit organisations and big foundations to be a part of its vision to contribute to a better environment.

The company also wants to implement sustainable solutions in smart cities, industries and tourism areas.

"EcoLoo can be installed at rest areas, schools, deserted areas, tourist areas, beaches, events or construction sites with almost zero and hassle-free maintenance.

"We want everyone to be able to afford to use EcoLoo and so we are constantly finding ways to reduce costs," says Zuraina.

EcoLoo aims to be a world-leading sustainable solution provider and achieve related UN sustainable development goals by 2030.

the waste inside the upper chamber. The waste cover will open when the user sits or squats on the toilet and closes as soon as the user steps out.

According to Zuraina, the upper layer of the toilet is where the human waste is collected and treated. This is also where the organic filter is placed.

"EcoLoo does not require water, though water can still be used for hygiene purposes. Instead, it uses special microbes that will 'eat up' the solid waste and break down the excreta into particles.

"This special bacteria turns this waste and other degradable waste such as toilet paper and tissue into ash within just three to four days. It also acts as an agent to neutralise bad odour and treat the liquid.

"The liquid then will go through the organic filter into the lower box. After going through a nitrification process for about half an hour, the treated liquid becomes natural fertiliser," she says.

Zuraina adds that the treated liquid was tested in five different laboratories in different countries with the same results. There was no sign of bad bacteria and it met the World Bank standard.

The lower chamber is built with a special indicator and outlet for end-users to collect or drain out the ready-to-use byproduct each time it is full. The byproduct can be channelled straight to the fertiliser pipe for agriculture.

Even if the liquid drains out, it is safe for the environment.

"The special formula, a combination of seven types of enzymes which we call ECOBAC+, is safe for humans. The enzymes can survive in any climate condition. In



EcoLoo toilets were used at the 29th SEA Games in Kuala Lumpur.

extreme cold climates, even up to -50° Celsius, insulation and heating coil are added to enable the right temperature for the bacterial culture to live.

"Other than human waste, ECOBAC+ also breaks down food waste, industrial waste, dirty water, grease and petroleum waste into particles."

The toilet is made of coated fibreglass that can withstand heavy weights, floods, strong winds, vandalism, disaster and extreme cold or hot climate conditions.

It comes in various designs and shapes, such as for standing (lurinal), sitting,

squatting, for both indoor and outdoors, temporary or permanent, single or multiple use, rural or urban areas.

SOCIAL IMPACT DRIVEN

According to the World Health Organisation, some 827,000 people in low and middle-income countries die as a result of inadequate water, sanitation and hygiene each year.

Inequalities in access are also compounded when sewage removed from wealthier households is discharged into storm drains, waterways or landfills,