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50 ideas TO CHANGE THE WORLD

She walks to school, a backpack on her back. It's no ordinary bag, though. A stunningly simple idea will allow her to use it as a source of light by which she can study at night. The invention – now in use in remote villages in Ivory Coast – is one of 50 innovations that aim to empower those in need.



ILLUSTRATION: MANUEL A. FRANCISCO

EMPOWERING...

 <p>Wheelchair users 12</p>	 <p>The unwell 4</p>	 <p>The homeless 14</p>	 <p>Those with special needs 6</p>
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Fifteen-year-old Maslia Lubis had been blinded by cataracts since the age of three. She got her sight back after A New Vision gave her a free small-incision cataract surgery, a quick procedure that cut out and replaced her cloudy natural lenses with clear intraocular ones. PHOTO: A NEW VISION

EMPOWERING THE VISUALLY IMPAIRED

Gone are dark clouds that had them blind

I By **Arlina Arshad**
The Straits Times

INDONESIA • Farmer Kasnan Wondin thought his life was over when he began losing his eyesight to cataracts last year. The 48-year-old from a village in Gresik regency in East Java had to give up work, stop riding his motorbike and say goodbye to his favourite pastimes like catching crabs. Corrective surgery at five million rupiah (\$8530) per eye was well beyond his means. Like millions of other low-income cataract sufferers in Indonesia, a country of nearly 260 million people, he could only prepare to go blind.

He said: "I felt so sad. Where can a poor farmer like me find so much money?"

Mr Kasnan's worry ended last May, when the Singapore-based non-profit organisation A New Vision gave him a free small-incision cataract surgery, a quick surgical procedure that cut out and replaced his cloudy natural lenses with clear intraocular ones. It costs the organisation \$100 per eye. A New Vision aims to treat cataracts in countries such as Indonesia, where half of all blindness is caused by cataracts, through the quick, safe and low-cost procedure.

The organisation was set up in 2010 by Nepali humanitarian eye surgeon Sanduk Ruit, 62, Singaporean entrepreneur and philanthropist Tan Ching Koon, 60, Indonesian social worker Indra

Wahidin, 65, and Ms Effi Jono, 48, an accountant from Indonesia.

To date, A New Vision's volunteer eye surgeons have performed nearly 20,000 operations for the rural poor through its surgical outreach events in Java and Sumatra.

With funds from multinational companies, foundations and private donors, it has sent 25 doctors for training in specialised eye surgery in Nepal. It is also sending nurses to be trained in eye screening and post-operative follow-up care, and is raising funds to build a high-quality but affordable community eye centre in Indonesia.

Ms Effi said: "Eye care should be a right, not a privilege."

ST MORE ONLINE
<http://str.sg/4bbs>



A New Vision's volunteer eye surgeons have performed nearly 20,000 operations for the rural poor through its surgical outreach events in Indonesia. ST PHOTO: ARLINA ARSHAD



Velvetine, of the Vezo community in Madagascar, says gleaning octopus is "the only way I can earn money". The octopus is used as the catalyst to protect the eco-system while providing a living for the people. PHOTO: GARTH CRIPPS/BLUE VENTURES

Telling tales from an octopus' garden

2
By **Tom Bawden**
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BRITAIN • The waters off the coast of Madagascar used to teem with life. But overfishing by foreign fleets, increasingly extreme weather brought about by climate change and a build-up of

soil released by nearby deforestation have severely degraded this coastal bounty. A cheap, simple and effective solution has been offered by London-based conservation group Blue Ventures – a “softly, softly” approach that involves large doses of octopuses and good storytelling. Typically, marine protected areas are imposed upon fishing communities without any explanation for the rationale or offers of any form of compensation.

This often results in a stand-off between conservationists and the local communities they are trying to help. Blue Ventures' founder Alasdair Harris and his team work closely with local communities, typically using octopuses to demonstrate cheaply and quickly the power of conservation. “We're not primarily interested in conserving octopuses. We use the octopus as the catalyst to protect the broader eco-system. Seeing

their rapid recovery allows us to start a conversation with the locals,” said Dr Harris. Closing off a quarter of an octopus fishing area for just three months has been found to double their catch in that area after it reopens. Velvetine, a member of the Vezo ethnic community living on the south Madagascan coast and beneficiary of the programme, said: “Octopus gleaning is the only way that I can earn money. With the reserves we make a small sacrifice,

but the catch is good in the days after openings.” Blue Ventures, which gets 70 per cent of its funding from donors such as the government and the rest from diving holidays, has also used giant clams and blue swimmer crabs as “gateway species” to sell conservation to sceptical communities. The group also works in Timor, Leste, Mozambique and Indonesia on a broad range of conservation projects using the “catalyst” model.



Beekeeping has become a vocation and source of income for women trained through the Association for the Promotion of Mountain Apiculture in Algeria. The methods taught emphasise environmental values and sustainable development.

EMPOWERING WOMEN How sweet it is to be sustainable

3
By **Tassadit Chibani**
El Watan
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ALGERIA • Though Ms Messad Djoudi's father is a beekeeper, she never took an interest in what he did. But today, the young woman has her own farm with 10 hives, thanks to training by the Association for the Promotion of Mountain Apiculture (APMA), which equips women with the skills to embark on beekeeping as a livelihood. “I signed up to the APMA course out of curiosity, and I ended up gaining the necessary know-how, and then also the will, to throw

myself into this activity,” said Ms Djoudi, who confirms she can now earn a living through the honey produced by her hives. Said Mr Mohand Ouamer Ould Braham, president of APMA: “Beekeeping has become a true vocation and source of income for all the women trained through our association, though none of them would ever have thought themselves capable of setting up their own farm one day.” Based in Ain el Hammam, 45km to the south-east of Tizi Ouzou (150km to the east of Alger), APMA set up its first Apiary School project in Djurdjura in 2010 with financial support from the United Nations Development Programme and the Association for Solidarity, Migration and Exchanges for Development (Asmed).

Mr Ould Braham said the methods taught are those that emphasise environmental values and sustainable development, ensuring an organic product. It is a region known for its honey. Close to 4,700 beekeepers have been counted in the province of Tizi Ouzou, and the vast majority of these holdings have been set up in the mountains. Honey production came close to 500 quintals (or 25,401kg) last year. No fewer than 18 women have set up their own farms, thanks to hives provided by Asmed. APMA is now spreading its work out towards all sectors of mountain agriculture, with other training courses being offered by professionals in areas such as cattle farming, poultry farming and rabbit keeping.

From milk to fabric

Milk gone sour? Don't waste it. Soured milk has been turned into various things, yogurt and cheese among them. Now add to the list: fabric. A German company, Qmilk, has found that soured milk can be spun into silky-soft cloth, particularly useful for those with allergies.

HOW IT WORKS



1 When milk goes sour, it separates – into whey at the bottom and a solid at the top. Remove the whey and what remains is cottage cheese.



2 This is dried into a protein powder, similar to that used by athletes.



3 The powder is mixed with water and other ingredients, resulting in a dough.



4 This substance is then put through what has been described as a big noodle machine. A nozzle with tiny holes forces out fine textile fibres instead of noodles.



5 It takes less than 5 minutes and 2 litres of water to create 1kg of Qmilk fibre. The company currently uses 1,000 tonnes of waste milk per year sourced from half a dozen local farms, and pays about four cents a litre for the waste milk.

Qmilk founder Anke Domaske was inspired to invent Qmilk after her stepfather was diagnosed with cancer. Here, she is pictured in her laboratory with waste milk, protein powder and cloth made of milk.



OTHER USES

• Qmilk technology has been adapted to produce non-woven materials as well, including toilet paper suitable for the most sensitive skins. In Italy, they have hit the shelves, thanks to a collaboration between Qmilk and Italian company Lucart, one of Europe's largest manufacturers of paper and tissue products. The name of the toilet paper: Carezza di Latte – which translates as "milk caress".



• The Qmilk biopolymer has also been used to make cosmetics. Containing natural peptides from the milk protein, they protect the skin and regulate its natural processes.



PROPERTIES

- Silky smooth
- Gentle on the skin, suitable for people with sensitive skin (created only from natural and renewable resources)
- Machine-washable (at up to 60 deg C)
- Has antibacterial properties (on E. coli and Staphylococcus aureus)
- 100 per cent biodegradable (home compostable in 6 weeks)

SOURCE & PHOTOS: QMILK & ISTOCK STRAITS TIMES GRAPHICS

A fresh spin: Silky cloth from sour milk

4

By **Nick Spicer**
Sparknews

GERMANY • In 2009, when Ms Anke Domaske was 26, her stepfather developed leukaemia. "He couldn't find anything to

wear because he had such a low immune system, and his skin reacted to everything," said the young German microbiologist.

Most cloth contains chemicals used in the growing and manufacturing process: Cotton production, for instance, is said to use 35 per cent of the world's insecticides and pesticides.

So Ms Domaske and a small group of friends who would later join her

company, Qmilk, went to a grocery store and bought US\$200 worth of milk and basic cooking tools.

And they started to experiment, using a 1930s technique for making milk casein fibre first. They tested more than 3,000 recipes over nine months to create a silk-like cloth that would not dissolve in water.

There were those who counselled using artificial chemicals for a quicker solution. "And I was so

stubborn, I said no, it has to work with just natural resources."

Because of health and safety standards, German farmers throw out around two million tonnes of milk every year – enough to fill 770 Olympic-size swimming pools.

Qmilk works closely with about 20 farmers in Germany, though Ms Domaske plans to expand. One such farmer is Mr Bernd Pils, who said he cannot sell sour milk

from cows that are feeding their calves, are ill or taking medicine.

"I find this exciting," he said, "because we always have a part of our milk that cannot be used for human consumption. So it's great for sustainable development."

Ms Domaske said: "There is a huge amount of wasted milk all around the world." If she had her way, millions might one day be wearing it.



EMPOWERING STREET URCHINS

Helping young talent cut it in the arts

5

By **Marc-Antoine Pelaez**
L'Orient Le Jour

LEBANON • In 2009, on a humanitarian trip to the isolated Lebanese village of Chmestar, Ms Zeina Saab met 14-year-old Nadeen Ghosn, who boldly showed her a collection of her drawings.

Ms Saab, a Lebanese-American, was blown away by the elaborate dress sketches. Nadeen had not even learnt the basics of fashion design.

"When I met her, I knew that she could one day become the next great fashion designer. But without means or resources, her talent would probably never be cultivated," said Ms Saab, now 33.

Over the next three years, she and a team laid the groundwork for the Nawaya Project, an innovative organisation that, through its Talent Programme, helps marginalised youth develop their talent which they can integrate



Ms Nadeen Ghosn, a beneficiary of the Nawaya project, dreams of creating her own clothing line. PHOTO: THE NAWAYA PROJECT

into the workforce.

There have been more than 300 beneficiaries since the beginning of the project, with talents and passions in fields such as design, music, performing arts, coding and robotics. Nawaya hopes to expand throughout the Middle East.

One of Ms Saab's first successes was to enrol Nadeen in CAMM Fashion Academy, a top fashion school in Lebanon. Through crowdfunding, Nadeen raised US\$15,000 (S\$20,500) for the full

three-year programme. Today, she works full time at Atelier C in Beirut, and dreams of creating her own clothing line.

Nawaya relies on sponsors as well as regional and international partners. Its website also hosts an online donation platform.

Today, it has a new project, Impact Lab, funded by Unicef. It matches young unemployed Lebanese who have innovative solutions for their communities with entrepreneurs who can help turn their ideas into reality.

EMPOWERING AT-RISK YOUTH

Off the streets and gainfully employed

6

By **Angelina Davydova**
Kommersant

RUSSIA • Rabota-i is a recruitment agency with a difference. Based in St Petersburg, it helps international and Russian companies recruit job applicants from disadvantaged social backgrounds. These are youth who have recently left state-run orphanages, as well as young disabled people with no work experience – and thus have low employment prospects.

"If you grow up in an orphanage in Russia, you end up having practically no skills by the time you leave. Public care systems are very strictly structured and socially isolating, which means that you also tend to have very low motivation for finding a job. You end up living on social welfare and communicating with only a handful of other leavers," said Mr Mikhail Krivonos.



Mr Mikhail Krivonos says if you grow up in an orphanage in Russia, you end up having practically no skills by the time you leave. His social enterprise Rabota-i aims to help these youth find jobs. PHOTO: RABOTA-I

Six years ago, he left his job at an international consulting company to set up a social enterprise, Rabota-i ("rabota" meaning "work" in Russian).

Every year in Russia, some 10,000 to 15,000 young people leave state-run social care institutions, but few find work and become an active part of society. Many end up on social welfare and drift into crime, or alcohol or drug abuse.

Rabota-i invests in training and coaching candidates, and helps

companies adapt to their new employees, providing consultancy and coaching at the workplace for the first six to nine months.

"We are working to fulfill the demand of businesses – the financial support and control of Rabota-i also comes from a number of Russian and international companies," he said. Last year, Rabota-i provided employment training for around 700 young people in St Petersburg and it plans to expand to other regions of Russia.



A girl needs a stool to have her X-ray taken because a power cut means the machine could not be adjusted. With Pristem's machine (below), a generator ensures it can work for a few hours in a power cut. PHOTOS: SYLVAIN LIECHTI, ALAIN HERZOG/EPFL

X-ray machine for tough conditions

7

By **Cécile Denayrouse**
and **Bertrand Beauté**
La Tribune de Genève

SWITZERLAND • Without modern medical imaging, doctors cannot properly diagnose conditions such as fractures or pneumonia. And yet, "two-thirds of the global population still don't have access to this technology, which is

incredible, considering that the X-ray was first invented more than a century ago", said Mr Bertrand Klaiber, the founder of Pristem. To address this global health problem, the Lausanne-based entrepreneur developed a robust and inexpensive X-ray machine that can survive environments totally unlike that in the aseptic and air-conditioned hospitals of developed countries. The GlobalDiagnostiX X-ray machine can withstand temperatures of up to 45 deg C and 98 per cent humidity levels, as well

as high quantities of dust. Electric motors used in industrialised countries to make the arms move have been replaced by a mechanical system, while digital technology instead of radiological films cuts down on costs. A specially designed generator lets the radiology machine operate for a few hours in a power cut. "The medical equipment industry has always focussed on innovation, but in Africa, the priority lies in meeting basic needs. This is what we're offering, and this

requires a certain amount of invention to provide high-quality images in a reliable and sustainable manner," said Mr Klaiber. Pristen offers inclusive contracts, and the machine comes with a six-year warranty. Where there is an Internet connection, the devices can be monitored remotely and support given to local personnel to help them do preventive maintenance. Radiology services can also be carried out remotely via the Internet. The project hopes to create



nearly 400 jobs in Africa, and 25 in Switzerland. Both African and Swiss investors have come on board and the start-up is halfway towards meeting funding to put its product on the market.

EMPOWERING WORKERS

App lets workers engage their bosses

8

By **Shaer Reaz**
The Daily Star

BANGLADESH • The ready-made garment sector in Bangladesh employs more than four million workers, often under hazardous conditions. The collapse of Rana Plaza in 2013, for instance, killed more than 1,100 workers.

Tech start-up Kutumbita aims to empower workers in the garment industry through an application designed to foster clear and equitable communication between employer and employee in firms which are too large for traditional communication channels.

Using Kutumbita's app, workers can log complaints with their supervisors – and attach pictures such as that of a blocked fire exit – access details about their salary and benefits, schedule training programmes, apply for leave and exercise their rights as employees of an organisation.

Management can use it to send out emergency alerts, as well as resolve complaints speedily and with transparency.



Kutumbita's app aims to empower garment workers and foster better communication between them and their employers. PHOTO: SHAHRIAR RAHMAN

RMG manufacturer SQ Group has signed up nearly 13,000 employees as the first client of Kutumbita, and provided 3,000 handsets to its workers. SQ is using Kutumbita's app to send notifications to workers, schedule training, accept leave applications, register complaints and conduct surveys. Every employee of SQ has received an optional bundle, consisting of a free entry smartphone and a SIM card. It

comes with an 18-month instalment plan so it is not a financial burden. Mr Warisul Abid, ?adirector at SQ Group, said the app has enabled greater engagement with employees, lowering operation costs and enhancing productivity. Kutumbita's country manager Shahriar Rahman said the company's "mission is to convert the non-desk workforce to first-time technology adopter and make sure they are heard".

EMPOWERING COASTLINE COMMUNITIES

Lifeline to keep children afloat

9

By **Jan Victor R. Mateo**
The Philippine Star

PHILIPPINES • With over 7,000 islands in the tropics of the Pacific, the Philippines boasts some of the best beaches in the world.

But the country also ranks high in drowning-related deaths – especially among children. A recent study released by the World Health Organisation shows an average of 2,500 people drowned in the Philippines every year between 1980 and 2011. While the government is implementing various initiatives to address the issue, there is no denying that there is a lot more to be done.

This was why, in 2015, a group of Australian students from Griffith University, headed by Mr Andrew McLean, decided to implement a drowning prevention programme across coastline communities in the Philippines. Float Philippines aims to engage global and local organisations – including the government – to come up with strategies that will lower the drowning rate. It plans to



Mr Andrew McLean discussing swimming strategies with the Zambales Swim Team in the Philippines. PHOTO: FLOAT PHILIPPINES

implement "learn to swim" and "surflifesaving" programmes, particularly in tourist resorts such as Baler in the north-west of the vast archipelago. "For the 'learn to swim' project, we are hoping to partner Baler Central Primary School to create a sustainable swimming programme. By doing this, we hope to extend the teachers' expertise and allow them to reach more swimmers," said Mr McLean. There is still much work to be

done to address the problem of drowning in the country. But for these students, nothing can hinder their determination that Filipino children should be safe in the water. "We think that everyone should have the ability to learn to swim and enjoy an aquatic environment," Mr McLean said. While the long-term objective is to promote a culture of safer aquatic spaces, the team knows it has to limit the programme for now, to make it sustainable.



More than 250 centres throughout Argentina practise equine therapy, which seeks to aid the rehabilitation of illnesses involving physical or psychological disabilities. PHOTOS: FUNDACIÓN EQUINOTERAPIA DEL AZUL/© THEY ARE TOMORROW

The horse as healer: A gentle nudge back to health



10

By Teresa Buscaglia
La Nación

ARGENTINA • When Ms Maria de los Angeles Kalbermatter lost her leg at age 27, she began to rehabilitate herself through horse riding, an unprecedented choice.

Not only did she find emotional healing, she also began to impart that experience to children with different illnesses.

"The only people who believed in this were those who loved horses," she said. Today, however, more than three decades after Ms de los Angeles founded the first equine

therapy school in Latin America, more than 250 centres throughout Argentina practise it.

This therapeutic method seeks, through the use of horses, to aid the rehabilitation of illnesses involving physical or psychological disabilities.

"Equine therapy is based on three basic principles: the transmission of body heat, rhythmic pulses and a pattern of movement equivalent to that of the human gait. The horse is a being capable of healing through both emotion and body language, and serves as a mirror to the human soul," said Ms Julieta Malleville, director of the La Paloma School of Equine Therapy, in the city of Tandil.

The horses used for therapy are either criollo (creole) or crossbred horses that are no taller than 1.6m and aged between eight and 15. They must be docile by nature, which gives therapists and patients the total confidence required in order to work with and trust them.

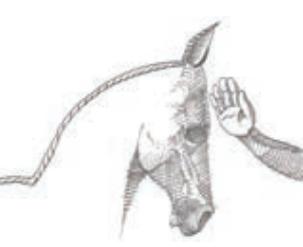
In the last 15 years, equine therapy has evolved and been used to help diseases such as stress, depression, phobias, addictions, obsessive-compulsive disorders and eating disorders.

The psychotherapy sessions are mostly performed next to, not on top of, the horse, so it is not necessary to have previous experience of riding.

Physician Veronica Settepassi, who has worked for 15 years at the Hipocampo Equine Therapy School in the Palermo neighbourhood of Buenos Aires, said equine therapy helps people to control their fears and connect with the environment.

"The movement of the horse reconciles the person with their body, it makes them feel good. I had cases of people with depression and eating disorders that showed very rapid improvements," she said.

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EMPOWERING FEMALE MUSICIANS

Girls in tune: A concerted pitch to fulfil childhood dreams

11

By Hassan Karimi
Hasht e Subh

AFGHANISTAN • After nearly three decades in which it stayed shut because of the Taliban's ban on music, the Afghanistan National Institute of Music (Anim) re-opened in 2010, keen to rekindle a musical teaching tradition.

Now, it teaches courses in both classical Western and Eastern music, in instruments such as the violin, viola, guitar, piano, trumpet and flute, as well as the robab, ghichak, tambour drum, qashqarcha, the three-stringed sarod, and the delroba.

Anim has around 250 students, including 75 girls. In 2014, these young women pooled their talents to form the Zohra Orchestra, the first in the country to be made up exclusively of girls. It held its first event at the Canadian Embassy in Kabul.

The original idea for the Zohra

Orchestra came from a student named Mina, who, unfortunately, had to go back to her home province because of family problems, and then was forbidden by her family to return to Kabul.

The musicians in the orchestra range from 12 to 21 years of age, and have had the opportunity to play internationally, like at the Davos Forum in Switzerland.

Every year, between 300 and 400 applicants take the institute's entrance exam and only 50 of them are offered places. About half are homeless or orphaned children, referred by non-governmental organisations.

At the institute, both well-off students and orphans attend music classes under the same roof. They express their emotions – whether that means pain, hope, joy or grief – through music, so that one day, they will be able to fulfil their childhood dreams.

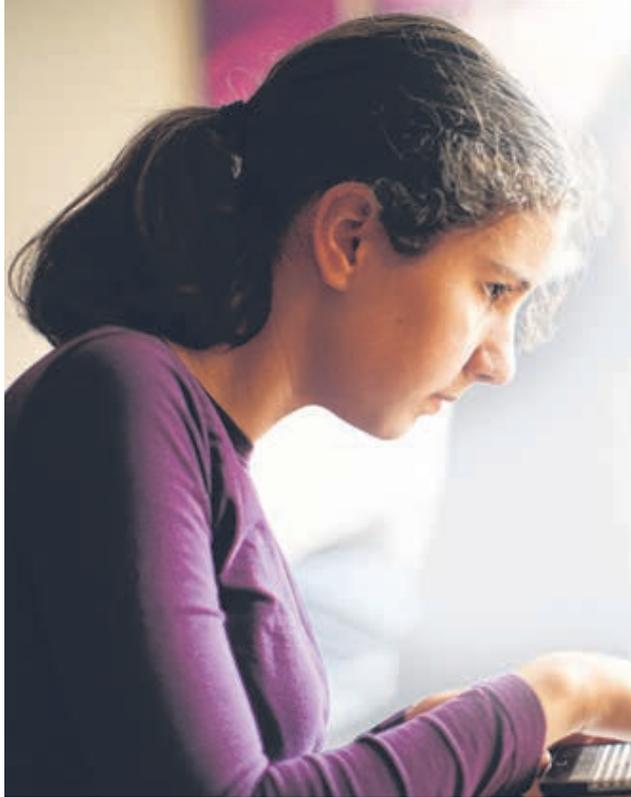
As director Ahmad Naser Sarmast says: "The Afghanistan National Institute of Music is like an island of hope in the dark. This institute is the symbol of the Afghanistan of tomorrow."



The Zohra Orchestra is the first in Afghanistan to be made up exclusively of girls. It held its first event at the Canadian Embassy in Kabul. The musicians range in age from 12 to 21, and have had the opportunity to play internationally, like at the Davos Forum in Switzerland. PHOTO: HASHT E SUBH

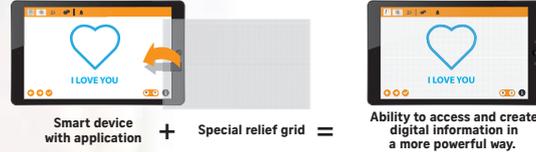
12 Finger dance

Mia swipes and taps her finger on a tablet screen. In the past, it would have been just a blank mirror-smooth slate for the student at the IRIS Centre for the Blind and Visually Impaired Youth in Slovenia. But now, thanks to an innovation by 4WEB, it is a book, a drawing pad and more for her.

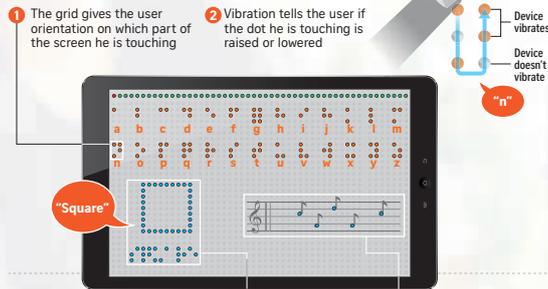


WHAT IT IS

Patented innovation Feelif is a multimedia device, consisting of a touchscreen device with a special app and a special relief grid. With Feelif, one can feel shapes, hear sounds, music and speech, and see colours.



HOW IT WORKS



APPLICATIONS

- Learning the Braille alphabet (feel the Braille letters, hear the letters).
- Learning shapes, languages and writing (feel the shape, hear the word, read it in Braille).
- Reading and writing music.
- Interactive storytelling for children. Hear - Feel - Interact.
- Writing homework for blind students. Sending homework to teacher.
- Drawing.
- Entertainment games.

SOURCE: FEELIF, MAJJA PRIJATELJ VIDEMSEK, DELO STRAITS TIMES GRAPHICS: CHNG CHOOH HIONG

EMPOWERING WOMEN

Free cervical cancer screening – and total support for patients

13

By Joanna Stawicka
Rzeczpospolita

POLAND • At the age of 30, Ms Ida Karpinska received the news that she had cervical cancer. Luckily, thanks to her regular cervical screening visits, the cancer was detected at an early stage and she was able to overcome the disease. This experience led to her decision to improve awareness about the importance of regular screening for women. She started the Kwiat Kobiecej (Flower of Womanhood) society which, for the past eight years, has been encouraging Polish women to undergo regular tests.

Part of the campaign involves mobile testing units. The test itself takes only two minutes, and women can drop by and be screened without having to make an appointment. Nor do they need to have health insurance to take a test in the mobile units. "The mobile units screened 308 women in Warsaw this year. One in 10 was found to have tumours", she said.

Kwiat issues coupons in women's magazines and on internet sites for free gynaecological screening. "Our suggestion is to go for cervical screening on their birthdays, as a present to themselves," said Ms Karpinska.

To get the word out early, she also goes to schools to raise awareness among girls, and Kwiat volunteers

support women who are in gynaecological cancer wards.

The problem of cervical cancer is a serious one in Poland: Even though the government will pay for a prophylactic test once every three years, as many as 80 per cent of women do not make use of this opportunity. As a result, the cancer is often discovered too late. Half of every 10 women in whom it is detected every day die, according to the Polish Oncology Association.

In fact, Poland has one of the highest morbidity rates (an incidence of about 3,000 people per year) and fatality rates in Europe. The number of women dying of cervical cancer in Poland is 70 per cent above the European Union average. Furthermore, the vast majority of cases are due to the human papillomavirus, which can now be protected against with a vaccine. Kwiat has other activities, like the St. Nicholas' Day campaign when women visit cancer patients in hospital. Said Ms Karpinska: "We bring them cosmetic items – lotions, creams, tissues... They are still women, and caring for themselves helps them feel better."

The organisation is not just for women with cervical cancer. Those with ovarian cancer can also find help at Kwiat. "We are busy throughout the year, not just during campaigns, and we're always there to support anyone who asks for it. We work not only with doctors but also with psychologists and sexologists. This is how we give women all-round help," said Ms Karpinska.

EMPOWERING VULNERABLE FAMILIES

Plumbing for better health and hygiene



Modulo Sanitario in Argentina aims to resolve the sanitation needs of families living in informal settlements. It equips the families' kitchens with a sink and tap with hot water, and puts in bathroom units consisting of a sink, tap, shower and toilet. PHOTO: LA NACION

14

By Micaela Urdinez
La Nación

ARGENTINA • Jesus Ponce celebrated his 18th birthday with a cake given to him by a family whose toilet he was building. Jesus lives in Florencia Varela, a town in the south of the province of Buenos Aires, with his five brothers and his father. Four

months ago, they finally got a bathroom and kitchen, thanks to an initiative by Horizonte de Maxima. To show his gratitude, he decided to volunteer to ensure that other families could have the same. "Just as they helped me, now I can help others. It was nice to meet the family that we are building for... they came in with a cake to celebrate my birthday," he said. Through the project, Modulo Sanitario, Horizonte de Maxima seeks to resolve the sanitation needs of families living in informal settlements, and contribute to

their health and hygiene. According to the 2010 Argentine national census, six million people do not have a bathroom. By April, 61 units had been installed and the idea is to build 100 more this year. How did the project come about? Mobilised by the great social inequality that exists in Argentina, eight university students from both technical and humanitarian backgrounds worked with vulnerable families to design a dignified, low-cost and easy-to-assemble sanitation unit. In these settlements, almost

every household has an outside bathroom, with walls of sheet metal and no roof. The group equips kitchens with a sink and tap with hot water. The bathroom unit consists of a sink, tap, shower and toilet. The cost of each unit is US\$24,000 (US\$33,200) and the family is asked to contribute US\$2,000 to make the cesspit required for the construction and installation. The remaining US\$22,000 comes from Horizonte de Maxima, which raises this money primarily through individual and business donations.



Ms Ngoc Nhon (right) and her Vietnamese compatriot Pham Thi Thuan at Asian Bowl, the restaurant they are running in South Korea after completing internships at social enterprise Oyori Asia. PHOTO: CHEOL MIN AHN

Cooking their way to independence

15

By **Suyeon Kim**
Dong-A Ilbo

SOUTH KOREA • Ms Jihey Lee was a successful marketer at an IT company when she decided to give it all up in 2008 and set up a social enterprise helping marginalised women. "I felt sceptical about the way I

made money, with contents full of sensationalism. As a woman, I did not want to participate in such anti-feminist work, so I started a new business," Ms Lee said.

She opened a restaurant in a small corner of Sangsu-dong, Mapo-gu, convinced the food business would be the easiest point of entry for socially vulnerable immigrant women without educational backgrounds or personal networks.

Today, her social enterprise Oyori Asia has trained women across three Asian countries,

helping them find their feet again.

Many are like Ms Ngoc Nhon, who arrived from Vietnam in 2006 to marry a Korean, and gave birth to a child shortly after. But her marriage fell apart because of her husband's gambling addiction. By 2010, she was a single mother with a son she needed to support.

Two years later, she met Ms Lee, and began training to be a cook. Last year, she opened a Vietnamese restaurant, Asian Bowl, which she runs with another young single mother from Vietnam. Her dream is

to settle in South Korea while making food from her homeland with other women like her.

In the 1990s, rural Korean men who could not find a match began taking wives from countries such as Vietnam. In the last five years, 128,864 international marriages were registered, and the number of divorces hit 50,853.

The ultimate goal of Oyori Asia is to support women like Ms Ngoc Nhon to become self-reliant. Said Ms Lee: "The reasons women in poor countries choose

international marriage are mostly economic. If they had been self-reliant in their homelands, they would not have had to come to Korea to marry an utter stranger."

Ms Lee has also extended Oyori's reach to Nepal, where Cafe Mitini in Kathmandu has offered work and barista training to women. Dawa Dabuti Sherpa, who worked and trained for four years, expects to open Cafe Mitini No. 2 next month. She said: "I dream of becoming a good barista through the programme."



EMPOWERING FOOD CRUSADERS

Food for thought: Waste not

16

By **Catherine Cleary**
The Irish Times

BRITAIN/IRELAND • A college project devised by two students to redistribute surplus food from retail outlets to charities that need it has become a big success in Ireland, so much so that the concept is catching on in Britain. Ms Aoibheann O'Brien still remembers the first box of food collected five years ago. She and co-founder Iseult Ward picked it up at a farmers' market and dropped it off to a youth services centre in Dublin.

The delivery was a dummy run for their college project, tech start-up FoodCloud. Five years on, 8,300 tonnes of food, more than 18 million meals, have been diverted from landfill. FoodCloud employs 30 people tackling food waste from almost 2,000 businesses in Ireland and Britain.

Until late last year, FoodCloud transactions involved more than 18 million meals, have been diverted from landfill. FoodCloud employs 30 people tackling food waste from almost 2,000 businesses in Ireland and Britain.



FoodCloud co-founders Iseult Ward (far left) and Aoibheann O'Brien at one of their warehouses. PHOTO: FOODCLOUD

disadvantaged people.

Now, at the duo's large warehouse near Dublin, the scale of their new operation, FoodCloud Hubs, is visible. "There's a lot wasted at retail level but there are huge volumes that go to waste before they even get to a supermarket and they're in bulk," said Ms O'Brien. This warehouse and others in Cork and Galway take pallets of food from businesses, including supermarket distribution centres and food producers, and

deliver them to charities.

In Britain, more than 1,600 branches of Tesco and three Waitrose stores are now posting donations of food.

There are still challenges as FoodCloud grows, not least keeping the operation financially sustainable and getting food out quickly so it does not go to waste in its warehouses. But feedback is encouraging. "People felt intuitively that this was a really good thing to do," said Ms O'Brien.

EMPOWERING FOOD CRUSADERS

From leftovers to delicious dishes

17

By **Reinaldo José Lopes**
Folha De S.Paulo

BRAZIL • "I used to be horribly fussy about food," admitted Ms Regina Tchelly, a 35-year-old cook and entrepreneur from Morro da Babilonia, Rio de Janeiro. "I wouldn't go near anything that was wholegrain."

For the past six years, though, she has been doing precisely that – and more. As head of the Favela Organica project, Ms Tchelly has taught over 30,000 people how to grow their own vegetables in tiny spaces, to transform banana peels, broccoli stems, pumpkin shells and other improbable raw material into delicacies and to turn what they cannot use in the kitchen into compost for their home gardens.

The founder of Favela Organica came to Rio as a teenager and worked as a housemaid for many years before deciding to apply for seed funding from the Agencia de Redes Para Juventude (Youth Network Agency), a government programme for small-scale social entrepreneurship. That was in 2011, when Ms Tchelly set up her



Ms Regina Tchelly with her pumpkin peel buns and other culinary delights made from leftovers. She tries to create food that is beautiful and also has a lot of heartfelt memory. PHOTO: ALAN MIGUEL GONÇALVES

first workshop – in her own home.

"My main concern is to create a kind of gastronomy that is not elitist. My recipes try to create food that is beautiful and also has a lot of heartfelt memory – something that your grandmother could cook for you," she said.

Ms Anita de Oliveira Santos, a 42-year-old assistant nurse from Morro da Babilonia, says taking part in Ms Tchelly's workshops was a huge eye-opener. Recipes that immediately caught her

attention were the banana peel brigadeiro (a traditional Brazilian sweet, usually made with condensed milk and powdered chocolate) and the watermelon rind risotto. "We call it natural Viagra," she laughed.

Ms Tchelly is about to bring her recipes and advice to a wider audience – her debut as the host of her own TV show at Futura, an educational channel that could be described as a kind of Brazilian PBS, is scheduled for August.

A room, toilets and soap for those in need

Whether it is for children scarred by conflict in Colombia or the homeless in San Francisco, various groups are stepping in to help them. Go to [The Straits Times Impact Journalism Day website](#) to watch videos made about their efforts.



18

They look like any other children - caught in the spell of toys, games and dappled sunlight. But beyond this room is a region embroiled in violence. In Santa Rosa, a post-conflict zone in Colombia's capital Bogota, former guerrilla fighters, locals and families displaced by the violence struggle to co-exist. In this environment, Centro COMPArte hopes to facilitate their integration.

ST VIDEOS
<http://str.sg/impact>



19

Go up this bus, and grab a ... shower stall. That is what a fleet of blue buses in San Francisco is offering to its homeless. Since 2014, Lava Mae has breathed new life into retired city buses, converting them into mobile toilets and shower stalls. By delivering basic hygiene to the city's homeless, the organisation hopes to restore their dignity.

PHOTOS: EL TIEMPO & LAVA MAE

EMPOWERING COMMUNITIES

Making dirty water drinkable

20

By **R. Vedrenne**
L'Actu/Mon Quotidien

FRANCE • The Safe Water Cube is a water-purification system.

Some 20 of these boxes have already been installed in Morocco, India and Haiti.

The 1.2 cubic m stainless steel container has five different filters, including sand and carbon. It makes all surface water - even muddy water - drinkable, says its creator, French engineer Jean-Paul Augereau. It also destroys "all the viruses and bacteria responsible for diarrhoea, dysentery, cholera and hepatitis, without destroying the minerals in the water", purifying up to 1,000 litres per hour without electrical energy.

The fountain costs €3,500 (\$5,400) and is sold primarily to humanitarian organisations and local authorities. According to the United Nations, 10 per cent of the world's population lacks access to safe drinking water, with many



The 1.2 cubic m stainless steel container has five filters and makes all surface water drinkable.
PHOTO: SAFE WATER CUBE/FACEBOOK

having to travel miles to find a safe water source. Every day, around 3,000 children die from diarrhoeal diseases linked to polluted water.



EMPOWERING COMMUNITIES

Water-filtering system a splash hit

21

By **Michelle Bao**
and **Jacquelyn Guillen**
City Press

SOUTH AFRICA • I-Drop Water aims to increase the accessibility of safe drinking water by making purification and distribution processes more efficient.

According to a 2015 World Health Organisation report, about 300 million people in Africa and 1.8 billion people worldwide use a drinking water source contaminated with faeces.

Frustrated by the drinking water industry's inefficiencies, Mr James Steere and Ms Kate Thiers Steere left their jobs in 2015 to start I-Drop as an alternative business solution. The purification systems are installed in any grocery store with access to a running tap, at no cost to the shop owner.

Customers can then purchase safe drinking water for one rand (10 Singapore cents) per litre. At the end of each month, I-Drop splits the profit from water sales evenly with the shop owner. Said Mr Steere: "It's a price point low



I-Drop's water-purification system uses a nanocarbon configuration to filter out viruses, bacteria and cysts - anything that is carbon-based and could make someone sick - while retaining the water's minerals. PHOTO: CHIVAS THE VENTURE

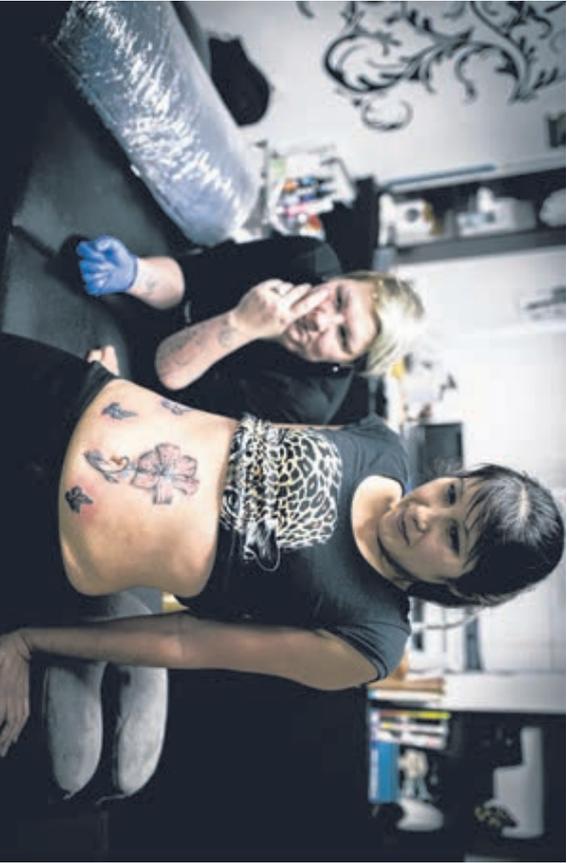
enough for just about everyone to afford and it's incredibly efficient." The system's water filter, which is made in the United States, uses a nanocarbon configuration to filter out viruses, bacteria and cysts - anything that is carbon-based and could make someone sick - while retaining the water's minerals.

Using GSM technology, I-Drop machines can be monitored from anywhere and require minimal oversight. Its system also reduces

plastic waste because consumers can use their own containers or purchase a reusable one instead of buying individual water bottles.

I-Drop has partnered more than 60 shop owners in South Africa, Zimbabwe, Botswana and Ghana and has sold more than half a million litres of safe drinking water.

ST VIDEO
<http://str.sg/4bbe>



In a room, 31,000 women are victims of domestic violence every year, with 12,000 killed as a result. A young artist, the Argentine Zuley Berli, is working on the scars of abused women and during the art - for Photo: MORA/880029

Body art – from scars of violence

22 **By Mariotti Sassi**
LONDON, ENGLAND
Turning them, for free, into art, whose body is covered with the scars of violence, is the mission of the artist Mariotti Sassi. She is a 35-year-old woman from the north of Italy, who has been painting her body for several years. She has several tattoos, including a large one on her abdomen that depicts a woman and a young girl. She has also painted her face with white paint to resemble a woman who has been abused.

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Sharon, a woman in Nigeria, is one of the women who have survived acid attacks. In the picture, Sharon is with other women who have survived acid attacks. Photo: SHARON/880029

Facing the future bravely – together

25 **By Sarah Kirby**
LONDON, ENGLAND
In Nigeria, women are brave. They are the backbone of the country, and they are the ones who are facing the future bravely. They are the ones who are facing the future bravely, together. They are the ones who are facing the future bravely, together.

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EMPOWERING EARTH Forest grown on waste faces threat

23 **By Sandra Smeadigo**
LONDON, ENGLAND
In the UK, a forest of trees is growing on a waste site. The trees are growing on a site that was once a landfill. The trees are growing on a site that was once a landfill. The trees are growing on a site that was once a landfill.

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EMPOWERING EARTH Virtuous plant rejuvenates community

24 **By Robina Sami Khatibi**
LONDON, ENGLAND
In the UK, a virtuous plant is rejuvenating a community. The plant is a type of tree that is known for its ability to improve the soil and to provide shade. The plant is a type of tree that is known for its ability to improve the soil and to provide shade.



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EMPOWERING EARTH Problem of plastic waste? It's sorted

26 **By Melissa Sime**
LONDON, ENGLAND
In the UK, a problem of plastic waste is being sorted. The problem is that there is a lot of plastic waste that is not being recycled. The problem is that there is a lot of plastic waste that is not being recycled.



26 **By Melissa Sime**
LONDON, ENGLAND
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EMPOWERING EARTH Farmers' best friend: 'Uber tractors'

27 **By Helen O'Connell**
LONDON, ENGLAND
In the UK, farmers are using 'Uber tractors' to help them with their work. The tractors are being used to help farmers with their work. The tractors are being used to help farmers with their work.



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Transformer car

Those who have lost the use of their legs do not have to be rendered immobile – many can and do drive. Yet, current options for wheelchair users are not wholly satisfactory, as most are ordinary vehicles modified to be wheelchair-accessible. Now, a family from the Czech Republic has designed a car that allows the front to be opened so that drivers can park facing the pavement, open the door and wheel right out safely.



Interior view

Features:

- Unassisted access and driving directly from the wheelchair**
 With a remote-controlled front-opening door and access ramp, a person in a wheelchair can simply roll into the car, secure the wheelchair, close the door and drive away.
- Use any type of wheelchair**
 Elbee is both manual and electric wheelchair-compatible, as long as it is approved to be used as a substitute for a seat in a motor vehicle.
- Your needs, your Elbee**
 Controls, a wheelchair-docking system, and an access ramp are among various parameters that can be adjusted to suit the needs of the individual user.
- Parallel parking?**
 Try perpendicular parking. Elbee allows its drivers to park facing the sidewalk, open the front door and exit straight onto the pavement.
- Take a friend along**
 A foldable passenger seat is situated in the rear, right behind the driver. Stow the seat to carry groceries or luggage.



Key specifications



- Maximum speed: 80kmh
- Petrol-powered
- Average petrol consumption: 4.5litres/100km
- Weight: 400kg



SOURCE: ELBEE STRAITS TIMES GRAPHICS

Cap xxxxx PHOTO. XXX

Wheelchair driving gets a fresh spin

28

By **Jana Klímová** and **Magdaléna Fajtová**
Respekt

CZECH REPUBLIC • When Mr Ladislav Brazdil bought an old collective farm with a partner after the Czech revolution, what he really wanted was to engineer and

market his own product. His dream became reality when a design engineer asked him about an idea he had in mind: an urban micro-car designed specifically for disabled drivers. "It was something unique that we, as an engineering business, could produce in part, and, at the same time, it supported our own development as a manufacturing business." He and his two sons now have

their own business manufacturing such cars: Elbee Mobility, in the small town of Lostice in the Olomouc district of North Moravia, the Czech Republic. The Elbee vehicle opens from the front, and the driver enters straight into it on a wheelchair. The front-end opening of the car is an innovation that enables independence for wheelchair users who drive. To get in, they back up a ramp into the vehicle, secure the wheelchair, and drive.



Ordinary vehicles that have been adapted for wheelchair use still present the problem of needing to stow the wheelchair. If users do not have the strength to do this themselves, they would need help. Another advantage of this compact car is that it can be parked on a street facing the pavement, so drivers can simply ride out and be safely among pedestrians. But although its current price of almost US\$25,000 (S\$34,600) can be cut by two-thirds through

various subsidies and reliefs, it is still cheaper for wheelchair users to modify a normal car. Despite this, dozens of Elbee cars are now on the roads of Europe. It marks a major breakthrough in travel for disabled people. Mr Ladislav Brazdil Jr said: "We've had reactions from people saying that thanks to the Elbee, they're now learning to drive and they are regaining strength and ability. In our small way, we're restoring their lives."

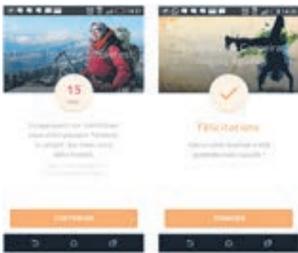
EMPOWERING YOUNG COMPANIES

Projected to raise funding

29

By **Stéphanie Jacob**
L'Économiste

MOROCCO • The meteoric rise in crowd-funding projects, which allow an entrepreneur to raise funds from the donations of private individuals, has taken many countries by storm. Two young Moroccans finishing their master's degrees in finance have set up their own such project, under the name TakaFull. It is, in essence, a mobile application that connects contributors to young entrepreneurs who find it difficult to acquire appropriate funding. Users select one or more projects from a menu and read the detailed descriptions and funding history. Once the choice has been made, the contributor sends an SMS converted into monetary value to fund the project. This text messaging service has a unit value of about €1.50 (S\$2.30). Half the amount goes to the selected entrepreneur, about 8 per cent goes to TakaFull, and the rest to the operators and service providers. TakaFull's co-founders Omar



TakaFull is a mobile application in Morocco that allows citizens to donate money to young entrepreneurs who find it difficult to acquire the appropriate funding for their projects. PHOTO. L'ÉCONOMISTE

Tolai and Mohammed Yassin Kamel decided to capitalise on a combination of digital opportunity, the high number of cellphone users in Morocco and the growing demand for self-employment. They had barely started their campaign when they were spotted and offered support for their endeavours. Last year, they were fourth in the Solve For Tomorrow competition, organised by Samsung Electronics Morocco and Enactus Morocco, an event aimed at encouraging ideas for improving people's lives and

the development of solutions by young entrepreneurs using infocomm technology. Today, they are working on their graduation project, leaving the TakaFull application on standby. "We have everything we need to get started, supplier contracts and mentors, but we are still looking for a developer who would like to get involved in this adventure," said Mr Tolai, who added that the team's objective is to finance 410 projects in three years through the application, according to their "most conservative estimate".

EMPOWERING CHARITIES

Want to help a good cause? It's Simple

30

By **Sahar Araby**
Al Masri al Yom

EGYPT • Egyptians in many areas, especially those in underprivileged villages, have been deprived of water resources for many years. They often resort to buying from water vendors who roam areas where there are shortages. To find a solution to this crisis, a group of young volunteers from the start-up Bassita (Simple) launched an initiative that would help raise money for charity through users' clicks on social networking websites. The initiative takes advantage of Egyptians' tendency to participate in charitable initiatives and the long time they usually spend browsing social networks. Bassita coordinates with charities in order to create a promotional video of the work they want to do in a particular region or for people in need of specific donations or reforms. The videos are presented by charitable celebrities in a bid to catch the attention of a wider audience.



Bassita in Egypt coordinates with charities in order to create promotional videos of the work they want to do in a particular region or for people in need of specific donations or reforms. PHOTO. VINCIANE JAQUET

Once Bassita agrees with sponsors and donors to these charitable organisations on the price for a certain number of clicks by users, the video gets published on social networking websites. Each interaction by a user on the video scores a point until the targeted number of interactions is achieved. Bassita calls this process "clickfunding". Bassita successfully participated in a joint campaign with Unicef to

provide running water for 1,000 houses in south Egypt. It posted a video in February last year featuring actor-comedian Maged al-Kedwany, with the hashtag "A click conveys water". The video hit more than two million views in just three days. In six months, running water was being piped to homes. The project included a hygiene awareness programme and cost US\$170,000 (S\$234,500).

It's a dog. It's a cat. No, it's HeroRAT!

Apopo, a non-profit humanitarian organisation, has been deploying african giant pouched rats in mine detection operations since 2014. These trained rodents – dubbed HeroRATS – are cheaper and much more adept at sniffing out TNT than dogs or humans armed with metal detectors. Mine-free land equates to peace of mind to people in countries such as Cambodia who depend on it for sustenance.

'MINE-BOGGLING' FACTS

About 60 countries in the world are still plagued by landmines and other residual explosives.

More than 105,000

landmines and unexploded ordnance cleared in Tanzania, Mozambique, Angola, Cambodia and Thailand since Apopo's founding in 1997.

THE MINE SQUAD

Length of a rat (includes its tail, which makes up half its length) **Up to 90cm long**

Training commences when they are **around 5 weeks old**

Duration of training: **About 9 months**

All in a day's work

- The rats are able to detect:
- Both metal and plastic-cased landmines
- Landmines buried 15cm to 20cm underground.
- TNT in low concentrations and the smell of it from a distance of about 1m.



NOTE: Drawing is not to scale.

■ = 20 minutes

20 minutes

The time taken for a rat to search over an area of up to 200 sq m



WHY THE GIANT AFRICAN POUCHED RAT (CRICETOMYS GAMBIANUS)

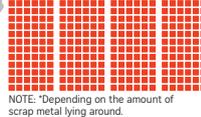
No humans, or rats, working with Apopo have lost their lives on the job.

- At about 0.9kg to 1.4kg, it's light enough to scamper over buried mines without setting them off.
- Intelligent and has an acute sense of smell to rival that of dogs.
- Calm and docile temperament.
- Cheap and easy to breed and maintain.
- Can work in the field for up to five years.



Up to 4 days*

The time needed for a technician with a metal detector to comb the same area



NOTE: *Depending on the amount of scrap metal lying around.

■ = One month

About 9 months

to train and certify a rat to detect landmines.



About 2 years

to train a mine-detecting dog and costs 10 times as much



THE MAKING OF A HERO RAT

How the rats are trained to detect mines over a nine-month period.

- 1 Socialisation**
The rats interact with people and are exposed to various stimuli within the first few weeks of birth.
- 2 Scent conditioning**
Trainee rats are conditioned to relate click sounds with food rewards.
• They are then drilled to pick up TNT scents – only then will they get a food reward.
- 3 Scent discrimination**
• Various scents are placed under three sniffer holes.
• A click sound, as well as food incentive, will be issued only when it stops at the hole with the target scent. Repeat training reinforces the correlation.
- 4 Soil floor search**
• The training extends to locating the hidden target scent in a sandbox.
• The tethered rat learns to walk in marked lanes and return to its trainer for food reward after each successful search.
- 5 On-the-job training**
• The rats are released into a field with de-activated landmines.
• Training steps up from detecting surface-laid mines in small areas to mines buried deep underground in larger land plots.
- 6 Final test and accreditation**
The rats are put through a test with standards surpassing those in the International Mine Action Standards.

SOURCES: APOPO, NATIONAL GEOGRAPHIC, NEW YORK POST PHOTO: APOPO STRAITS TIMES GRAPHICS: LIM YONG

Hero with an unerring nose for trouble

31

By Lauren Crothers
Sparknews

TANZANIA/CAMBODIA • Merry is usually up before the sun, when she and her 11 colleagues are driven to work. They work for a few hours in the early morning, napping and drinking water between shifts. Her job, detecting landmines and other unexploded ordnance (UXO), requires a laser-like focus. It also

helps that at about 1kg in weight, she is very light of foot and does not set off the explosives.

Merry is an African giant pouched rat, or *Cricetomys gambianus*, a docile and exceptionally smart rodent with a superior sense of smell. She is one of a team of HeroRATS that are bred, trained and deployed by the Belgian non-profit Apopo, headquartered in Tanzania.

After helping to detect mines in Mozambique and Angola, the group partnered the Cambodian Mine Action Centre in 2015. Cambodia is one of the most

mine- and UXO-contaminated countries in the world. More than 1,600 sq km of the country is still contaminated by mines and other explosive remnants of war. More than 64,000 people were killed or injured by them between 1979 and February.

Harnessed and tethered to a cable that extends across a 10m by 20m grid and attached to handlers on either side, the rats work the ground with their noses, inch by inch, back and forth. They do this swiftly, checking an area the size of a tennis court in 30 minutes. When a rat smells TNT, the

explosive compound found in most landmines, it will stop and focus on that area before scratching lightly at the soil. Once the scent is confirmed, the teams begin a careful excavation to uncover what lies beneath.

"The impact has been big," said Apopo's international mine-detection rats supervisor Vendeline Shirima.

"People would say it was crazy, but when we started clearing Mozambique, they saw it was pretty amazing. We never miss mines using rats." Mozambique was officially declared mine-free

in September 2015.

Specially trained HeroRATS have also proven successful at sniffing out tuberculosis in Tanzania and Mozambique.

Quick and effective, the rats are also inexpensive to feed and house. Also, they can cover more ground in a shorter amount of time than a person with a detector, speeding up operations and freeing up funds for other needs.

A special programme allows people to "adopt" a HeroRAT online and help defray the costs.

For more information about Apopo go to www.apopo.org

EMPOWERING FARMERS

Ensuring farmers don't come a cropper

32

By Helen M. Flores
The Philippine Star

THE PHILIPPINES • Doing good comes with great rewards. This is the philosophy that keeps Cropital – a crowdfunding platform put up by a group of Filipino millennials to help local farmers – running.

Since its launch in November 2015, Cropital has provided financial support to around 560 farmers in the Philippines, said Ms Rachel de Villa, 24, the organisation's co-founder and chief technology officer.

"Cropital was born out of a need to support smallholder farmers by providing them with services that empower them, improve their productivity and ultimately



A farmer receiving training from the Cropital team. PHOTO: CROPITAL

increase their income," she said. "This is made possible by the growing global network of Cropital community who come from all walks of life and are willing to give their hard-earned money to support our farmers." The enterprise enables low-cost,

sustainable agricultural investments to support farmers.

"More than the funding, Cropital also helps farmers reduce the risks in farming and improve productivity by processing crop insurance, providing a buyer, and giving training and access to technology partners," she said.

At Cropital, people can choose from a list of farms to invest in. Cropital manages the fund for the farmers, making sure they get the resources they need, and investors receive their return on investment once the produce has been sold.

To date, Cropital has raised US\$120,000 (S\$166,500) worth in investment, according to Ms de Villa. The returns for users range from 3 per cent to 30 per cent in under six months.

Cropital won Social Enterprise of the Year at the Philippine Rice Bowl Start-up Awards 2016.

EMPOWERING START-UPS

Start-up space? Greece is the word

33

By Yannis Paliologos
Kathimerini

GREECE • There have been few rays of hope to cling to during Greece's long crisis.

One of them has been the steady emergence of the Greek start-up eco-system. Since four European Union-backed venture capital funds started operating in early 2013, there have been notable successes, including multimillion-dollar investment rounds and buyouts by major global companies.

The four EU-backed funds completed their life-cycle last year, having invested more than €50 million (S\$77 million) in new technology companies. But a new vehicle, Equifund, has been



Co-working spaces let start-ups help one another. PHOTO: KATHIMERINI

announced, with money from the Greek government, the EU and the European Investment Fund.

A critical aspect of the growth of the Greek eco-system – which, according to one estimate, is now made up of 350 to 450 firms – has been the emergence of a number of



PHOTO: APOPO

incubators, accelerators and other organisations focused on promoting entrepreneurship. Their founders are not only individual members of the scene but also banks, foreign embassies in Athens and even a group of Greeks in London keen to reverse the effects of the brain-drain caused by the crisis.

These spaces offer mentoring and legal advice, organise events with well-known international investors and businessmen, and even run pitching contests offering seed funding to the winners.

Beyond that, what can the government do to help the start-up sector? Entrepreneur Dimitris Kalavros-Gousiou said: "We need to do more to foster an entrepreneurial culture that will mobilise private Greek money and even international start-ups and investors to start looking to Greece for opportunities."



In India, this makeshift accommodation is woefully inadequate for the cold months. The weatherHYDE (in the background and below) has a triple-layer reversible cover that makes it an all-weather tent. PHOTOS: BILLIONBRICKS, ERIC YIP (FOTOGRAPIEY)

Come rain or shine – a tent of their own



ST
VIDEO
<http://str.sg/4bbh>

34

By **Priscilla Goy**
The Straits Times

SINGAPORE • For six years, a married homeless couple in Delhi, India, were forced to live apart in gender-segregated communal shelters. Last year, for the first time, they were able to move into their own "home".

Home is a tent, designed by the Singapore-based, non-profit organisation billionBricks. It can be set up by one person in 15 minutes without any tools or anchor pegs.

It is weather-resistant, offering protection from the city's extreme temperatures. It is spacious, able to fit a family of two adults and three children. The couple even moved in a bed, said billionBricks founder Praseon Kumar.

More than 20 homeless families have tried out the tent in Delhi and Mumbai.



Mr Kumar said homelessness is difficult to eradicate, but considers the tents an interim solution. "Time is required to find sustainable solutions, but there's also a humanitarian need, and, as time passes, people are dying."

The United Nations estimated 100 million people to be without homes in 2005. Many die from exposure.

The weatherHYDE tent is made to be weatherproof. In winter, its triple-layer, reversible cover provides insulation, while reflective

material on the inside retains body heat. In summer, the other side can be used to reflect solar heat and help people inside the tent stay cool.

It also provides privacy. Mr Kumar, an architect, started billionBricks in 2013. Last year, it raised more than \$145,000 through crowdfunding, enabling it to provide 500 tents to needy families. Each tent costs \$279.

Refinements to the tent's design include new locking mechanisms and waterproofing on both sides. Its weatherHYDE website

(www.weatherhyde.org) has a section where donors of a tent can type in its unique ID number to learn more about the homeless family who received it. billionBricks is also in talks with US groups to create jobs for people with disabilities by having them make the tents.

Aside from sponsors, Mr Kumar hopes to continue raising money through the weatherHYDE e-commerce platform, where the tents can be purchased and donated on a buy-one-give-one model and shipped anywhere in the world.

EMPOWERING CONSUMERS

Tracking the Provenance of that bag, or your tuna

35

By **Eleanor Ross**
Positive News

BRITAIN • Ms Jessi Baker, the founder of blockchain technology platform Provenance, envisions a future where all physical products have digital histories, allowing people to trace and verify products' origins, attributes and ownership. Is it time for a new dawn of transparency in retail?

Fuelled by frustration about how little we know about the products

we buy, Ms Baker founded Provenance in the summer of 2013.

The software platform is a means for people to find out where products are sourced from, and how ethically and sustainably. It is designed to improve the transparency of supply chains and, at the same time, promote brands that commit to ethical sourcing, fair working conditions, quality and sustainability.

The platform uses blockchain technology – a means of recording and storing enormous amounts of transactional data – to inform consumers about how their products are sourced. Provenance data can be linked to any physical

product – from coffee beans to fish – through labelling, smart tags and embeds for websites or apps.

"Provenance encourages brands to volunteer data about their supply chain," said Ms Baker. "We ask them to prove that data, track it, and they must provide links back to proven materials. We want to showcase the businesses that are really trying to be ethical."

The Provenance framework does not only benefit the customer. Brands that can prove that their supply chains stack up nicely could be able to charge more for their product. Transparency could become a competitive advantage. Last year, Provenance completed

a six-month trial tracking tuna fish caught ethically in Indonesia. Fishermen sent text messages detailing their catches that were added to the Provenance blockchain, effectively attaching a digital "token" to the fish as it passed through the supply chain.

The team now works with more than 200 brands.

Provenance, which is based in Britain, has 10 employees in four countries, and Ms Baker is enthusiastic about meeting the challenges ahead. "We want to help prove the great work that people are doing. We want to reinforce the good and get the good to spread quickly," she said.



Ms Jessi Baker founded Provenance, a platform that uses blockchain technology to inform consumers about how their products are sourced. PHOTOS: PROVENANCE

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Much to Beam about

36

By **Mette Dalgaard**
Politiken

DENMARK • Thirteen-year-old Yusuf Warsame shows up for school in Frederiksberg every day, takes part in class and gets up to pranks like any of his classmates – but he is not actually there.

At home, about 3km away, Yusuf accesses and controls a robot called Beam – actually a small screen attached to a post which moves around on three wheels – from his computer.

So, even though he suffers from a genetic mutation that causes tumours to develop and requires that he is shielded from risks of infection, Yusuf can still attend school.

The brains behind the project are IT instructor Morten Jacobsen and teacher Francis Norgaard, who continue to further develop and calibrate Beam's properties.

Instead of merely observing, Yusuf can now write on the interactive whiteboard and participate in board games on the smart board, as well as swap his face on his screen with YouTube videos, much to his classmates' amusement.

"The benefit of this technology is that you can tell Yusuf is behaving as he would when he was physically present. He is still somewhat of a troublemaker," quipped Mr Jacobsen.

And with a portable modem attached to Beam, Yusuf can also go on class trips.

The two robot developers recently embarked on the next stage of development to ensure that Beam can be used by children with other needs, from those unable to attend school due to long-term illnesses, to the ones



It is recess time for 13-year-old Yusuf Warsame, who attends school via Beam, the robot. Teacher Morten Jacobsen follows him around to keep him from pulling pranks. With Beam, Yusuf, who suffers from a genetic mutation and has to stay at home, can now not only take part in class sessions but also go on excursions. PHOTO: JANUS ENGEL/POLITIKEN

suffering from anxiety or phobias, or simply a broken leg.

"The robots are standard items, so it is important that we develop them and our approach to ensure that all children benefit from it. We concern ourselves with the challenges that the pupils face and finding solutions that improve their

quality of life," Mr Jacobsen noted.

The two teachers see global potential in using robots in schools, and are sharing their experience through SingularityU Denmark, part of Singularity University, a Silicon Valley think-tank that offers educational programmes and a business incubator.

Instead of merely observing, Yusuf can now write on the interactive whiteboard and participate in board games on the smart board, as well as swap his face on his screen with YouTube videos, much to his classmates' amusement.

EMPOWERING UNDERPRIVILEGED CHILDREN

Helping kids broaden their horizon

37

By **Elodie Blogie**
Le Soir

BELGIUM • This is school at its best. Every Saturday, some 300 10- and 11-year-olds from disadvantaged neighbourhoods around Brussels get a taste of what the future could look like, through activities organised by Tada, or Toekomst – F Atelier de l'Avenir (Studio of the future).

Initially inspired by the Dutch initiative IMC Weekendschool, this bilingual programme held in French and Dutch aims to "broaden the future horizons" of children from low-income neighbourhoods of the European capital. They meet passionate professionals who introduce them to their trade, whether that is law, medicine, construction, the arts, technology or hospitality.

These Saturday classes would be nothing without the hard work and tenacity of Tada founder Sofie Foets, who said: "For me, it's a great example of how civil society can contribute to the emancipation of kids from disadvantaged neighbourhoods.

"Everyone tells these kids that all they need to do to succeed later in life is to work hard at school. But they don't even know what 'later' means. Their network, their family, isn't in a position to show them what kinds of goals are in their reach."

This particular morning, for example, many of the children



Tada gives children from disadvantaged neighbourhoods in Brussels the chance to interact with professionals who introduce them to their trade, be it law, medicine or other disciplines. PHOTO: DOMINIQUE DUCHESNES

taking part are discovering, for the first time, the centre of Brussels and the Louise Quarter, which is close to the famous avenues of luxury shops.

Most of them had never left their neighbourhoods before.

The Dutch project which this initiative is modelled on has shown that children who get the chance to broaden their horizons evolve differently. They are better integrated into the labour market, and society as a whole.

Whenever anyone expresses surprise at the enthusiasm of these children, who, for three consecutive years, have taken part in these activities every Saturday – except during the school holidays – Ms Foets responds: "On Saturdays, these kids have nothing to do, except what they love to do."

Therefore, they love

to come here. At this age, a child wants to know more about the world."

Tada has three branches in Brussels: one in Molenbeek (in Dutch), one in Saint-Josse (which is bilingual) and one in Anderlecht (in French). Around 300 children attend these workshops. Each year, the association opens new classes, which then run for around three years. Despite their best efforts, they are still not able to meet the current levels of demand.

The organisation prioritises the most vulnerable children based on their parents' occupations, the language spoken at home and the number of children in each family, among other criteria.

With the demand already in place, Tada hopes to include around 1,000 young people in the programme by 2020.

EMPOWERING ENTREPRENEURIAL TEENS

Education can transform lives

38

By **Silvia Yamileth Pérez**
El Heraldo

HONDURAS • Eliezer Rodriguez has broken the gloomy cycle faced by many young people in his community. The 17-year-old is completing his secondary education at the Francisco Morazan school in the village of El Zurzular in southern Honduras, without having to walk for four hours or cross a river.

Today, he sees a promising future for himself. Instead of learning a trade to help his family, his dream is to go to college and train as a teacher of Spanish or mathematics.

The person responsible for this change in Eliezer's life is Ms Katia Gomez, a young American who, after several years of volunteer work throughout Latin America, realised her dream by establishing the social enterprise Educate2Envision (E2E).

E2E is an educational programme that aims to train entrepreneurial leaders. Since 2010, it has changed the lives of around 100 students from the rural communities of Francisco Morazan and El Paraiso in the south of Honduras.

Of the 5,000 people who inhabit these villages, the majority have never been able to complete secondary education.

"Our challenge is to change the mentality of these children, to show them that they can become professionals and help their



Educate2Envision is an educational programme in Honduras that aims to train entrepreneurial leaders. Since 2010, it has changed the lives of around 100 students from the rural communities of two villages.

community," says Mr Alex Agurcia, E2E's chief operating officer.

Before E2E, those who wanted to study at secondary school had to walk up to four hours to attend class at an education centre. Now, they are offered a space in which to study at the local elementary school, where they can complete sixth grade. Applicants need to have outstanding academic records.

Interviews are also conducted with them and their families.

E2E gets financial support from both the Rotary Club in the United States and Banrural in Honduras, enabling it to provide students with the necessary materials and cover at least 60 per cent of their tuition fees.

These young people become community leaders and act as an example for children who aspire to build their future. They are shaped

to become socially minded entrepreneurs, equipped with strategies to overcome their obstacles. E2E's students learn to carry out community impact work – from health prevention campaigns to building electrical infrastructure. Many of them go on to become volunteers for E2E.

About 70 per cent of graduates have collaborated to form a micro-enterprise that produces coffee under the Adelante Coffee brand, which is then placed in the US market by E2E. Most profits from the coffee sales go towards covering school fees for young people in the communities.

The students and families that benefit from this project are living proof that education can change lives. Through their own efforts, they are transforming their communities.



Solar-powered street lights can turn on and off when people pass by. EnGoPlanet's solar power project in Las Vegas aims to harness pedestrian power as well as the sun's energy to light up street lamps. PHOTOS: MATTHEW HENRY, ENGOPLANET

Turning on street lights step by step

39

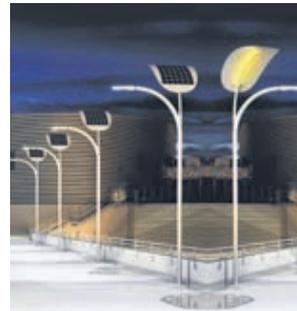
By **C. Hallé**
L'Actu/Mon Quotidien

UNITED STATES • Engineers in Las Vegas, Nevada, are testing a new system to illuminate the streets of the city. As if by magic, these solar-powered streetlights can switch themselves on and off when people pass nearby. The aim of this invention? To

reduce both pollution and electricity costs. Located in the middle of the desert, Las Vegas enjoys high levels of sunshine throughout the year, making the city an ideal place for solar energy use. A company, EnGoPlanet, recently installed four eco-friendly street lamps on a busy square in the city as part of a project. The system is simple. A battery is connected to rounded solar panels above the street lights that store the energy needed to illuminate the

square. But that is not all. The battery is also connected to kinetic tiles built into the sidewalk. Whenever a pedestrian walks on the slabs, the kinetic energy produced by the weight of their movement is harnessed. Thanks to small generators, each step generates four to eight watts, depending on the pressure exerted. The Smart Street Lights are the first to be powered by both the sun and pedestrians' footsteps. Mr Petar Mirovic, chief executive of EnGoPlanet, said: "Clean and

free energy is all around us. Urban cities have to build the smart infrastructures of tomorrow that will be able to harvest all that energy. This project is small, but a very important step in that direction. If it proves to be effective, it will be extended to other major American cities like New York or Los Angeles. The company is also aiming to raise money on the Indiegogo website in order to provide clean and free electricity to villages in Africa.



Paris rooftops: In European cities, getting permission to install a solar photovoltaic roof is hard because of aesthetic landscape constraints. An Italian company hopes to change that. PHOTO: EUROPEAN PRESSPHOTO AGENCY

EMPOWERING HISTORIC CITIES

Solar panels clearly in sync with surroundings

40

By **Elena Comelli**
Corriere della Sera

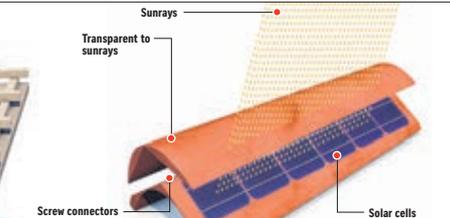
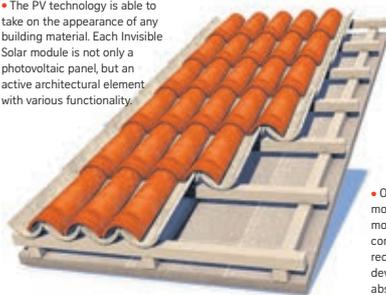
ITALY • In historic centres and buildings throughout Europe, obtaining permission to install a solar photovoltaic (PV) roof can be a complicated process.

Aesthetic landscape constraints are often so strict that the limitations become prohibitive, unless the solar cells are invisible. Now Dyaqua, a family-owned company in Vicenza, Italy, has created a product called Invisible Solar, a PV roof tile unlike anything else on the market. Mr Giovanni Quagliato, a Vicenza-born artist who specialises in creating epoxy resin artwork,

Solar roof tile

The unique photovoltaic roof tile with a realistic surface, to achieve the maximum architectural and aesthetic integration.

- The PV technology is able to take on the appearance of any building material. Each Invisible Solar module is not only a photovoltaic panel, but an active architectural element with various functionality.



- Operating of Invisible Solar modules is based on the low molecular density. Each module is composed of a non-toxic and recyclable polymeric compound developed to encourage photon absorption.

- Inside the module, there are incorporated standard monocrystalline silicon cells. The surface, which is opaque to sight but transparent to sunrays, allows the light to enter and feed the cells.

SOURCE: DYAQUA STRAITS TIMES GRAPHICS

discovered the secret to giving a totally natural look to polymeric compounds, while keeping them transparent to light. However, the PV products are yet to be financially sustainable, as they require an exorbitant amount of manual work. So far, there aren't any machines

capable of replacing the careful hand of man in applying different layers of resin at varying densities, with the right curvature for the perfect roof tile. "To accelerate production and keep up with demand, we would have to invent machines that integrate or replace manual

work," said Mr Quagliato. Only in this way can mass production be achieved, contributing to lower prices and increased product competitiveness with large producers, such as Tesla's Solar Roof. But Dyaqua lacks the funds to invest in a machine. Mr Quagliato's

children, Matteo and Elisa, have launched a crowdfunding campaign on Indiegogo to try and raise US\$20,000 (€28,000) to pay for one. "Invisible Solar is my dream of a healthy world," noted Matteo, "where technology has the natural appearance of our landscapes."



Kaalink is attached to a vehicle's tail pipe to filter out residual soot (far left). This is then chemically processed and turned into a purified carbon pigment that, in turn, becomes Air-Ink (left), which was used to paint this mural in Hong Kong (below). PHOTOS: GRAVITY LABS, TIGER BEER

Art from pollution



41

By **Jacob Koshy**
The Hindu

INDIA • Even air pollution can yield something positive, such as art. Just ask Graviky Labs, a Bengaluru-based start-up which has come up with an innovative method to trap soot from vehicles and transform it into ink.

The team of industrial and automobile engineers, computer scientists and design enthusiasts developed a proprietary, retrofit device called Kaalink, which can be attached to a vehicle's tail pipe to filter out residual soot.

This is then chemically processed and turned into a purified carbon pigment that in turn becomes Air-Ink.

The unit captures 95 per cent of the particulate matter emanating from the engine without inducing back-pressure in the vehicle.

Designed to work on Indian roads and fitted with heat and waterproof electronics and materials, Kaalink is undergoing certification and is being tested in several pilot demonstrations.

Graviky Labs said its products aim to turn the darkness of pollution into bold strokes.

The range includes marker pens with tips of various thicknesses, which contain from 40 to 130 minutes of captured diesel car pollution. In the future, the "art from pollution" series will

include oil-based paints, fabric paints and outdoor paints.

Soot is mostly made up of fine black particles 2.5 micrometres or less in diameter and carbon produced by incomplete combustion of fossil fuels.

The problem of fine particulates is growing universally. A Greenpeace report released earlier this year showed that 90 per cent of Indian cities studied had pollution levels over prescribed standards.

The capital New Delhi was found to be the most polluted city,

with the annual average for PM10 being 268 micrograms per cubic m, which is more than four times the 60 micrograms/cubic m limit prescribed in the National Ambient Air Quality Standards of the Central Pollution Control Board.

Thanks to a successful Kickstarter funding campaign, the aim is to "scale up and make Air-Ink more widely accessible", the company said in a statement.

Graviky Labs claims to have cleaned 1.6 trillion litres of outdoor air so far.



EMPOWERING VILLAGERS

Zero electricity air-con made of plastic bottles

42

By **Nahela Nowshin**
The Daily Star

BANGLADESH • Bangladesh is predicted to be among South Asian countries most affected by a rise in global average temperatures in the coming decades.

Its rural population, which stands at more than 60 per cent, is especially vulnerable to this. Unlike the urban population, people in

rural areas do not have access to air-conditioning units.

But Grey Dhaka, the Bangladesh arm of US-based advertising and marketing agency Grey Group, may have found an answer. Last year, it launched the Eco-Cooler, the world's first "zero electricity" air-conditioner, invented by an employee, Mr Ashis Paul.

In a country where access to electricity in rural areas is limited, the Eco-Cooler can be considered as something of a miracle.

More than 70 per cent of Bangladesh's population live in corrugated tin houses which

amplify the sun's energy. During summer, the scorching heat can get unbearable with temperatures as high as 45 deg C.

Today, more than 25,000 households around the country have an Eco-Cooler. Being a developing country, Bangladesh faces a host of economic, social and environmental challenges which require out-of-the-box solutions. For these solutions to have a considerable impact, they need to be simple, cheap and efficient.

The Eco-Cooler checks all the boxes and perhaps that is the reason behind its widespread success.

Make your own e-cooler

What you'll need:

1. Lots of plastic bottles
2. A sturdy board (the size of your window)
3. Scissors or a pen-knife



Step 1: Cut holes on the board, they should be the size of the rim of the bottle. Ensure that the holes are spaced out enough to accommodate the body of the bottles.



Step 2: Cut the bottles in half, crosswise.



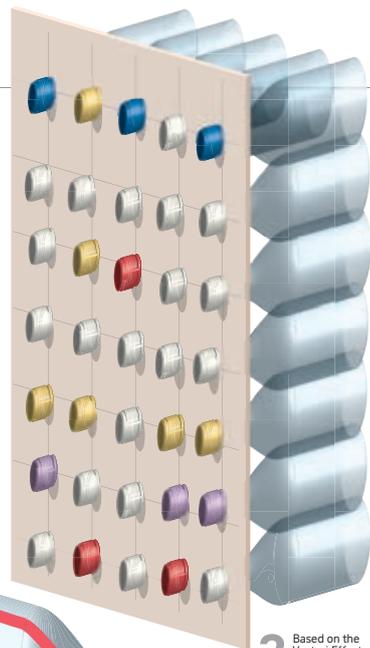
Step 3: Carefully cut away the tops of the bottle caps.



Step 4: Mount the cut bottles on the board. Secure them by screwing on the bottle caps on the other side.

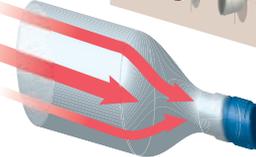


Step 5: Fix your eco-cooler on the window, with the bottle necks facing inwards.



How it works:

1 When hot air rushes into the bottle, the gas contracts as it approaches the rim of the bottle. This results in a decrease in pressure.



2 Based on the Venturi Effect, the drop in pressure results in an increase in velocity, which is what gives the air its cooling effect.



An Eco-Cooler - made of cut plastic bottles mounted on a board with the cut ends facing outside - installed in a window. Hot air entering the bottles is compressed in the bottle necks, which cools it before it enters the house. PHOTO: GREY GROUP



By taking on the distribution himself and printing the paperbacks for 30 US cents (40 Singapore cents) each, Mr Vincent Safrat has been able to sell each book for 80 US cents. PHOTO: VINCENT WOODOT/LE FIGARO

A book for the price of a baguette

43

By **Caroline de Malet**
Le Figaro

FRANCE • Publishing disruptor Vincent Safrat is not only selling books like they are bread rolls – and at the same price as a baguette – but he is also doing so on a massive scale. Last year alone, Mr Safrat sold around 2.5 million copies in France.

So, what is his secret? It is in the price. He is able to sell

each book for 80 US cents (\$1.10), which drastically undercuts the €7 (\$11) on average you would pay for a children's book. By taking on the distribution himself – which represents around 60 per cent of a book's cost – and in printing the paperbacks for only 30 US cents each, Mr Safrat has been able to achieve this innovative model.

Having grown up in the suburbs of Paris, Mr Safrat was an indifferent student until he discovered Gustave Flaubert's *L'Education Sentimentale* (Sentimental Education). He had a revelation. "I believe that reading can replace studying. Hence my

notion of bringing reading to those who don't read," said the convert to reading. In 1992, he began visiting various publishing houses every day, scooping up any unsold works to redistribute for free to homes in low-income suburbs. In 1998, after a friendly salesman explained that a paperback does not cost much more than a franc to produce, he started to print books at a low price and distribute them to schools. This became his focus when he realised many lacked the means to equip themselves. Schools either buy the works for their students or organise book sales for parents.

Though the books are sold at low cost, the authors do not lose out, thanks to the revenue generated by massive print runs. Not yet satisfied with his social impact, Mr Safrat also organises book workshops for children in Paris. Writer and co-founder of Lire et Faire Lire, Alexandre Jardin, said: "He has revolutionised the market economy because he thinks differently." Today, Lire c'est partir has 12 staff and six vans distributing books, and even Mr Safrat finally has a salary. All this has occurred without his asking for the smallest subsidy from the public authorities.

JUST READ IT

I believe that reading can replace studying. Hence my notion of bringing reading to those who don't read.



MR VINCENT SAFRAT

EMPOWERING EARTH

Purrfecting your energy-saving ways

44

By **Patricia Peiro**
El Pais

SPAIN • Cats have more hidden talents than just starring in YouTube videos and Instagram photos. They might also be able to teach us to conserve energy.

At least that is what a group of researchers from the Polytechnic University of Catalonia believe. They are leading a project that teaches families how to live in a more sustainable way, through a video game called EnergyCat: The House Of Tomorrow.

The game interface is similar to The Sims, a well-known social simulation video game, and players advance once they successfully complete missions related to energy efficiency.

The game rewards actions as simple as turning off the lights, and provides information on more complex issues such as choosing an energy-efficient oven.



The EnergyCat game rewards actions as simple as turning off the lights, and provides information on more complex issues such as how to choose an energy-efficient oven. PHOTO: ENERGAWARE/FACEBOOK

"Our idea was to make it fun. The protagonist is a cat and he fixes things that the family could be doing better, consumption of energy-wise," said research coordinator Miguel Casals.

Families taking part in a study can "compete" with participating neighbours and share their consumption scores on social media. But they are not required to

play every day. Initial results comparing the energy bills of households playing the game showed a 7 per cent reduction in consumption. Smart energy meter data sensors were installed so researchers can monitor progress.

The EnerGAware initiative has a budget of €2 million (\$3.2 million) and is funded by the European Union.

EMPOWERING DISASTER-HIT COMMUNITIES

Down but not out when disasters hit

45

By **Doyle Rice**
USA Today

UNITED STATES • Sisters Morgan and Caitria O'Neill never expected that a tornado would hit their small home town in Massachusetts – or that when it did, recovering from the disaster would change their lives.

On June 1, 2011, a pair of twisters ripped across the state, damaging their home in Monson. What began as a way to help their community get back on its feet after that disaster evolved into recovers.org – a free, easy-to-use

"recovery-in-a-box" website designed by the sisters to help other cities and towns quickly organise disaster relief.

It can be rolled out in minutes, helping local relief organisers turn interest in helping into systematic action, said Mr Chris Kuryak, the project's chief operating officer. The website helps locals manage



The recovers.org website helps relief organisers turn interest in helping into systematic action. It also lets locals manage volunteers and donations, track data about the disaster, and apply for grants. PHOTO: RECOVERS

volunteers and donations, track data about the disaster, and apply for grants and request aid through official channels such as the Salvation Army and Red Cross. It also links volunteers with victims, allowing both groups to alert each other to what is needed and their ability to help.

The organisation now hosts more than 200 recovers sites for communities around the world. "People should know that they can rely on these sites in their time of need," Ms Morgan O'Neill said. "This experience changed our lives, and now we're trying to change the experience."



Greenport toilets in Kreuzlingen, Switzerland. Human waste is collected, treated and, after a lengthy process, becomes terra preta or black soil. PHOTOS: ANDREA FESSLER



Power of poo

46

By **Martin Sturzenegger**

Tages-Anzeiger

SWITZERLAND • If the banana trees at Zoo Zurich are particularly lush, it is thanks to a fertiliser with an unusual ingredient: human waste. During spring last year, zoo employees cleared a bamboo grove in Zurich's Masoala Rainforest to plant the trees.

Within a few months, the saplings had reached an impressive height and produced a cornucopia of yellow fruit. "We were really surprised how fast the plants put down roots," said Mr Martin Baur, curator of the tropical area of Zoo Zurich.

The reason for this fast growth has a name – terra preta – which is Portuguese for "black soil". It is a particularly fertile substrate created from compost, charcoal (biochar) and human faeces.

The company that provides Zoo Zurich with the fertile substrate is Greenport, started in 2015 by four friends. "We wanted to break some taboos with our products," said Mr Tobias Mueller, a former carpenter and inventor. To obtain the raw material, the start-up team developed a mobile dry toilet, the Greenport.

The human waste drops into a container, which Team Mueller carries to a pyrolysis facility. Pyrolysis is the chemical decomposition of organic materials through the application of heat. The nutrient-rich matter is exposed to temperatures of up to 800 deg C, destroying toxic germs, viruses and hormones but leaving nutrients, trace elements and water intact.

The process yields charcoal (biochar) with a high storage capacity, and this extracts toxic substances from the soil and returns water or carbon dioxide to it. The biochar is supplemented with compost and soil organisms to obtain terra preta.

"We take human waste back to where it belongs – nature," Mr Mueller said.

Greenport practises in miniature what science has tried to work out on a much grander scale: How to recover valuable substances from sludge.

In Switzerland alone, sewage treatment generates 200,000 tonnes of sludge each year, from which 6,000 tonnes of phosphorus – a high-grade nutrient for the production of fertilisers – could be recovered. For the moment, the annual production of terra preta is limited to 200 cubic m, though Mr Mueller's start-up may well lead the way for production on an industrial scale.

One and a half years after Greenport's foundation, initial investments in production have been amortised, and Mr Mueller envisages the creation of a partner-network-system with branches across Switzerland. "Rented toilets are a market of billions. If we can have a small part of it, we're satisfied," he said.

EMPOWERING EARTH

Going the distance with fuel from old clothes

47

By **Noriko Akiyama**

The Asahi Shimibun

JAPAN • Mr Michihiko Iwamoto worked for a textile trading house that produced work clothes with threads made from PET bottles.

This gave him the idea that one could "circulate everything" by returning all used items to their original state and putting them into new products to sell.

Ten years later, he co-founded Japan Environment Planning and began to tackle recycling in earnest in 1995.

At that time, he met Ms Masaki Takao, who was convinced that ethanol could be produced from cotton, one of the major raw materials in clothing. Thus the idea behind Jeplan was born.

The textile and clothing industry is one of the world's most intensive economic activities, but only a very small percentage of used clothing is recycled.

Jeplan plans to change that by placing collection boxes at retail outlets for used clothing, which is

then sent to the firm's factories where cotton is reborn as ethanol and used as an energy source.

It was not easy to convince retailers to agree to this venture, but after two years, the company got Muji on board. Now, 70 retailers have collection boxes in their stores (or have agreed to do so).

Jeplan is not only processing products for recycling but also developing new products, such as an umbrella with replaceable plastic components.

Inspired by the movie series Back To The Future – in which a car that runs on garbage transports passengers from 1985 to 2015 – Mr Iwamoto negotiated with Hollywood firms and succeeded in conducting a joint project with NBC Universal.

He bought a DeLorean car like the one in the movie series and, on Oct 21, 2015 – the destination date featured in one of the films – held an event to drive it on ethanol made from T-shirts.

People could climb into the car for pictures if they donated old T-shirts for fuel.

The event was so successful that he collected in less than three months the number of T-shirts usually collected in an entire year.

A tank used to extract ethanol from cotton clothes. Jeplan processes products for recycling as well as develops new products. PHOTO: NORIKO AKIYAMA



In Kalisari village, tofu makers pipe waste water into containers that generate biogas for homes. PHOTO: KOMPAS

EMPOWERING COMMUNITIES

Gas what, that tofu liquid waste is mighty useful

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By **Megandika Wicaksono**

Kompas

INDONESIA • White smoke billows from the kitchen of a tofu maker named Tumirah in Kalisari village in Central Java. Soya bean stew boils in a large stove that the locals call a kawah.

In one day, Ms Tumirah can

process 80kg of soya beans to make tofu; this also produces 600 litres of waste water.

The wastewater used to be discarded, but now, it is piped to a digester container about 300m away and processed into biogas.

The biogas is then channelled through a smaller pipe to Ms Tumirah's house to light the stove.

Tofu liquid waste contains vegetable protein, vinegar and organic acid, which can be fermented to produce methane gas for cooking.

Ms Tumirah said her family has been using biogas to cook for three years, instead of liquefied petroleum gas (LPG). "I prefer using biogas rather than an LPG canister for fear of explosions."

She said it also helps her save money, since she needs to pay only a monthly fee to the biogas installer for pipeline maintenance and management.

Kalisari village has a population of 4,671 people, of whom 250 are tofu makers. In the past, they dumped their

waste water into the river, turning the water dense, smelly and foamy.

Untreated waste water has a pH of 4-5, which can kill fish and cause rice crop failure.

The pollution problem was resolved by the construction of five wastewater treatment plants, built between 2010 and 2014 with the help of several institutions, including Indonesia's Research and Technology Ministry. Now, 142

tofu makers pipe their waste water into digester containers, which generate biogas for 210 houses.



Smart jacket that diagnoses pneumonia faster than a doctor can

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By **Beatrice Nakibuuka**
Daily Monitor

UGANDA • When her grandmother died of what was diagnosed as malaria - after six months of symptoms such as a cough and fever - Ms Olivia Koburongo, 26, was devastated to discover that, in fact, the older woman had been suffering from pneumonia.

Children and the elderly are especially vulnerable to pneumonia. According to Unicef, pneumonia accounts for almost one million deaths of children worldwide every year. In Uganda, Unicef estimates the disease kills

up to 24,000 children under five every year, many of whom were misdiagnosed with malaria.

In 2014, Ms Koburongo, an engineering graduate from Makerere University, and four others came up with Mama-Ope (Mother's Hope), a biomedical smart jacket that detects and analyses pneumonia symptoms in children.

Currently in prototype, the jacket is worn by the child, and its sensors pick up sound patterns from the lungs, temperature and breathing rate. In four minutes, data is computed and sent to a mobile phone application which then gives a diagnosis.

"The jacket diagnoses, measures the extent to which the disease has affected the lungs and also enables tracking the progress of the disease

since diagnostic information is shareable," said Mr Brian Turyabagye, one of the founders of the project.

The team is seeking certification for its award-winning innovation from Uganda's Ministry of Health. According to studies carried out by its inventors, the jacket can diagnose pneumonia up to three times faster than a doctor can, and reduces human error.

After displaying the result, the app goes on to advise on the appropriate action. For instance, if the disease is severe, it advises the user to reach out to the nearest referral hospital.

The beauty of the innovation is that doctors can gauge the severity of the disease from the point it was first diagnosed by using the information stored in the cloud.



Mama-Ope (Mother's Hope) is a biomedical smart jacket that detects and analyses pneumonia symptoms among children, with the aim of providing more accurate diagnosis. Ms Olivia Koburongo, a graduate of telecoms engineering from Makerere University, says the team has developed a prototype that is three times faster than the standard diagnostic process in Uganda.



ILLUSTRATIONS: MANUEL A. FRANCISCO & CELESTINO GULAPA D. ROSA

EMPOWERING CHILDREN

Light to study by at night, thanks to a school bag

LIGHTING UP THEIR LIVES

We said to ourselves: In Africa, we have lots of sunshine which is free. Let's figure out an easier and more efficient solution to help these children so that they can have better academic results.



MREVARISTE AKOUMIAN who came up with the idea of the Solarpak when he was delivering computer equipment and office supplies to remote villages around the Ivory Coast that lacked electric power.

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By **Kamagaté Issouf**
Fraternité Matin

IVORY COAST • Little Michel Koutouan's grades have been improving lately and he readily gives credit to his specially-invented solar backpack.

There is no electricity at his home in Songon, a village in the south-eastern region of the Ivory Coast, which makes it hard for him to study at night. But this changed for him and dozens of other children in Songon and the nearby village of Grand Aferi, when they were given the backpacks.

The bags have a solar plate that stores energy from the sun during the day and is then used to power an LED lamp to provide hours of light each night.

The man behind the Solarpak, Mr Evariste Akoumian, came up with the idea when he was delivering computer equipment and office supplies to remote villages around the country that lacked electric power.

"We said to ourselves: In Africa, we have lots of sunshine which is free. Let's figure out an easier and more efficient solution to help these children so that they can have better academic results," he said.

It took Mr Akoumian two years of research and six months of field testing to finalise the product. He then distributed 500 free

solar bags to people in four localities of the Ivory Coast.

He hopes his award-winning project will provide easy access to electricity in Africa, where 700 million people live without power. But getting it off the ground is a challenge. Even with help from the US Embassy in the Ivory Coast to spread the word, Mr Akoumian has little financial support for his solar bags, which cost €18 (\$30), including taxes, each.

Currently, he imports the bags and small solar panels from Asia and assembles them in the Ivory Coast. He hopes to raise funds to have everything made domestically. "Then, we will not only bring electricity to those who don't have access to it, but we will also create jobs in our country."



An Ivorian child carrying a Solarpak. Mr Evariste Akoumian hopes his project will provide easy access to electricity in Africa, where 700 million people live without power. PHOTO: EVARISTE AKOUMIAN

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