

The UNEP Magazine for Youth

TUNZA



for young people • by young people • about young people

SUSTAINABLE WORLD

Young innovators
Forgotten diversity
Carbon farming
Building bridges
Sharing is caring



TUNZA

the UNEP magazine
for youth. To view current
and past issues of this
publication online,
please visit www.unep.org



United Nations Environment Programme (UNEP)

PO Box 30552, Nairobi, Kenya
Tel (254 20) 7621 234
Fax (254 20) 7623 927
Telex 22068 UNEP KE
E-mail uneppub@unep.org
www.unep.org

Director of Publications Naysán Sahba

Founding Editor Geoffrey Lean

Special Contributor Wondwosen Asnake

Youth Editor Karen Eng

Nairobi Coordinator Naomi Poulton

UNEP's Children and Youth Unit Joyce Sang,
Karishma Thethy

Circulation Manager Mohamed Atani

Design Edward Cooper, Ecuador

Production Banson

Cover image Dan Bergeron/fauxreel/

<http://lemoinejardinier.blogspot.co.uk/>

Youth contributors Florencia Goldstein, Santiago Lopes, Argentina; Felipe dos Santos Machado, Jeanne Martins, Daniel Ribeiro, Maiara Palmeira da Silva, Brazil; Oscar Contreras-Villaruel, Chile; Da Fang, Heng Feng, Qian Wang, Qing Huang, China; Fabrizio González, Pablo Calderón Tobón, Colombia; Claudia Escobar Prado, Irene Sánchez Villalobos, Costa Rica; Bruno Carlo Borro, Gustavo Altamirano Briones, Ecuador; Soumyajit Paul, Vaibhav Singh, India; Atika Astrini, Saiful Syadir, Indonesia; Wallace Chwala, Jessica Mukiri, Kenya; Loh Hong Khai, Chia Wen Shin, Malaysia; Henry Bonilla Bruno, Arturo Salazar Toledo, Peru; Justine Cañete, Glykie Cañete, Ma-an Jane Diamos, Philippines; Saeln Lee, SeonHyang Byeon, YoungBeom Kim, Republic of Korea; Gim Hsiang, Daniel Tan Shi Jie, Kevin Lee, Adrian Kho Jia Wei, Singapore; Thabisile Kamtshe, Eliot Mojapelo, South Africa; Yosapol Harnvanichvech, Wannita Sae-Tang, Sarocha Thenga, Thailand; Sanga Moses, Uganda; Rita Ferreira Hung, Miguel Sánchez Vezega, Venezuela; Do Thien, Trong Luu Quan, Viet Nam.

Other contributors Michael Preuss, Roland Keiper, Dirk Frenzel, Julia Hoppenau and Ruoyi Wang, Bayer; Alexandra Graham, St Karol School of Nursing, Ghana; Jessica Green, Biology and Built Environment Center, USA.

The contents of this magazine do not necessarily reflect the views or policies of UNEP or the editors, nor are they an official record. The designations employed and the presentation do not imply the expression of any opinion whatsoever on the part of UNEP concerning the legal status of any country, territory or city or its authority, or concerning the delimitation of its frontiers or boundaries.

CONTENTS

Editorial	3
"We will never forget ..."	4
Young leaders	5
Sustainability = common sense	6
Waste to treasure	7
Sharing is caring: the new economics?	8
What a waste!	10
Fake meat – friend or foe?	11
We all need bees	12
Quinoa – that's 'ki:nwa:	14
Carbon farming?	15
The Earth system: the good news	16
Microbes: forgotten diversity	17
Bugs, they're good for you!	18
A frog's life	19
Wildlife superhighways	20
Building bridges	21
Can cities help the globe go green?	22
One voice for clean air	23
Fighting malaria	24

Keep up with TUNZA on your mobile

<http://tunza.mobi>

or on Facebook

www.facebook.com/TUNZAmagazine



**Partners for Youth
and the Environment**



UNEP and Bayer, the German-based multinational involved in health care, crop protection and high-tech materials, have worked together to strengthen young people's environmental awareness and engage children and youth in environmental issues worldwide.

The partnership, originally signed in 2004 and renewed in 2007 and 2010, ran for 10 years. During the course of the partnership, UNEP and Bayer implemented a wide variety of projects including TUNZA Magazine, the International Children's Painting

Competition on the Environment, the UNEP Tunza International Youth and Children's Conferences, youth environmental networks in Africa, Asia Pacific, Europe, Latin America and the Caribbean, North America and West Asia, the Bayer Young Environmental Envoy Program and a photo competition, 'Ecology in Focus', in Eastern Europe.

The long-standing partnership between UNEP and Bayer became a public-private partnership that served as a model for both organizations.

Times are changing

This is TUNZA magazine's first totally electronic issue – coming out on <http://tunza.mobi> and www.ourplanet.com, where we're publishing new stories two or three times a week.

Then, we'll produce a compilation volume – like this one – for reference, which will also appear on www.unep.org/publications.

TUNZA magazine is for youth, by youth and about youth – so there'll be lots about what YOU and other young people are doing, what you and they have achieved, and ideas about what you could pick up and run with.

We'll also look at issues of concern to us all – from mega concerns such as climate change, resource use and food waste, to things like green jobs, green opportunities and how we can move to a green economy.

This new issue is all about opportunities. We are majoring on young innovators – the Bayer Young Environmental Envoys, all of whom are working to make our world more sustainable. Some of their work

focuses on research, some is about raising awareness and provoking change, while other efforts explore using waste as a resource.

We have a saying here: "ideas have legs". Many of these innovations are replicable where you are. Some are potential business ideas that you could take up. Or perhaps the research interests you. So could you contribute or help in some way? Whatever you can do, if you want to talk to any of these young innovators and benefit from their experience and imagination, please contact us through these pages or through Facebook (www.facebook.com/TUNZAmagazine) and we'll put you in touch.

And of course, we want to hear about what you are doing too, what you are thinking and what you are concerned about. So, please, tell us – using the same communications channels.

We made a resolution this year to be positive. So don't be weighed down by problems. We want to make TUNZA magazine a resource for ideas that, together, will walk us into a sustainable world.



“We will never forget ...”

THAT SENTIMENT was palpable at the closing party of the 2013 Bayer Young Environmental Envoys field trip to Leverkusen, Germany, in November 2013 as the 46 young people from 19 countries danced the night away. These enthusiastic young Envoys had been selected from among 1,900 applicants in a rigorous process, organized by Bayer, that included regional eco-camps.



M. Rennertz/Bayer

Each of the Environmental Envoys had won their place on the field trip by making a difference. Some are involved in game-changing, practical research – developing concrete from wood waste, working to produce coatings for growing fruit that needs protection from direct sun-light, extracting aluminium compounds from wastewater sludge, or finding ways of using a catalyst synthesized from cobalt phosphate to extract hydrogen from water as an energy source. Others are already making and selling sustainable products and services – including building materials made from recycled toothpaste tubes, applying a polymer-accelerated hot compost technique to provide farming communities with soil-enhancing compost and hot water, or running a social enterprise making soap from recycled cooking oils.

During a week-long field trip, Envoys were able to meet and learn from experts in the fields of recycling, water purification, waste disposal and sustainable solutions for managing the world's food supplies – including new packaging to minimize food waste. “It was mind-blowing,” said Wallace Chwala from the University of Nairobi, “and I found the session on how to turn a project into a business particularly useful ... it's totally expanded my horizons.”

The Bayer Young Environmental Envoy Programme has been a key element of the UNEP-Bayer Partnership for encouraging youth involvement in environmental issues. Started as a local project in Thailand in 1998, by 2013 it had galvanized youth in 19 countries on three continents: Argentina, Brazil, Chile, China, Colombia, Costa Rica, Ecuador, India, Indonesia, Kenya, Malaysia, Peru, the Philippines, Republic of Korea, Singapore, South Africa, Venezuela and Viet Nam.

Sadly, all good things must come to an end. After 10 years of working closely together to promote young people's involvement in environmental and sustainable development, the successful, supportive and dynamic partnership between Bayer and UNEP is winding down. “These are truly inspiring young people whom we hope will continue their great work in helping to make sustainability a reality,” commented Michael Preuss of Bayer Corporate Communications. “It has been truly refreshing for us to work with them over the years.”

All that's left to do is express thanks to Bayer on behalf of all of us who have been touched by their generosity in making so much available to so many for so long.

Young leaders



EACH YEAR, Bayer Young Environmental Envoys get the opportunity to present their projects, which vary from conceptual scientific research to totally practical, hands-on work. The most innovative, sustainable and easily replicable projects win Leadership Awards that include a seed-corn cash prize and development support from Bayer.

If you are interested in any of these projects, could help develop them, or would be interested in doing something similar where you are, please contact us through Facebook (www.facebook.com/tunzamagazine) and we'll put you in touch.

You can find details of the other 41 young innovators at <http://tunza.mobi>

Win-win-win-win-win



Wallace Chwala, from the University of Nairobi, Kenya, has developed a way of making compost in just 12 days using his community's organic waste. He sells the compost to local farmers, and teaches them about improving their soil. That's three wins. The fourth? He runs water pipes through his compost pits to heat water for the community. And the fifth is that he provides jobs for local people, too. Now Wallace has a difficult choice – does he develop his project to become the Compost King of Nairobi? Or does he travel the country teaching communities how to do it on their own? Go, Wallace!



M. Rennertz/Bayer

Light-transmitting concrete



M. Rennertz/Bayer

Soumyajit Paul, from SRM University, Kancheepuram, India, has found a way of transmitting light through concrete: embedded optical fibres in the concrete take in sunlight from outside and pass it into a building. This could be revolutionary for village and shantytown homes and large office buildings alike – reducing the need for electricity – as well as for road marking. It is not quite a commercial proposition yet, Soumyajit tells us, but he's aiming to take his research forward.

Sustainable energy



Claudia Escobar of the University of Costa Rica is developing REALLY low-cost solar cells – allowing more people to access this renewable technology. She's coating the surface of a titanium dioxide film with charge-transferring dye from fruit, flowers and microorganisms from species common in tropical regions. It's all biocompatible, and costs a fraction of the solar cells made from silicon. Research is well advanced and she'll start scaling the process up during 2014.



M. Rennertz/Bayer

All you need is a tolerant mum



M. Rennertz/Bayer

The trouble with toothpaste tubes is that they combine plastic with aluminium, so traditional recyclers don't want them. But **Felipe dos Santos Machado** from Brazil's Universidade Feevale has found a way of turning them into a material for making furniture and playground equipment and even for building. It all started in 2010 with an experiment in his family kitchen, using his mum's oven. It has grown a bit since then, and Felipe uses his engineering background to define manufacturing parameters, carry out strength and endurance testing and get quality certification. And now, he's ready to scale up his activities – after all his raw materials are available everywhere!

Cement from wood waste



Dream on? "No way," says **Kevin Lee** from Singapore's Temasek Polytechnic. He's done it. Depending on what strength you need, he has worked out how you can reduce the cement, sand or gravel content in a cement mix, replacing them with different types of wood waste. As making cement is one of the largest sources of carbon dioxide, this could be a major contribution to climate-change mitigation, quite apart from providing a ready use for forest and horticultural waste. GREAT innovation, Kevin, this could be the beginning of a revolution.



M. Rennertz/Bayer

Sustainability= common sense

There's no way around it: the 7 billion human inhabitants of Earth have the resources of just one planet. The problem is, we are currently consuming the resources of 1.5 Earths – and there are more of us coming. So, given that population is growing and everyone wants to live a secure and fulfilling life, how can we live well within the capacity of our planet and make One Planet Living a reality?

The good news is that we already have much of what we need in terms of technology, we know what the problems are, and we know what we need to do. Environmental issues have evolved from being a fringe interest to headline news in mainstream papers. Renewable energy technologies have developed and are now more accessible than ever. Industry and business are taking the initiative to make their supply chains more sustainable. Designers and engineers are incorporating the principles of the circular economy into their designs – starting with the end in mind so that nothing ever becomes waste.

Cities all over the world are making their own efforts to become greener. More people are aware of how and why soil and freshwater are being depleted, and we know it's better to eat locally produced food. Everyone is becoming more interested in making things with their own hands, participating in sharing economies, and experiencing things rather than consuming items in a virtual rather than material world, such as online film and music – even face-to-face telecommunication. Consumers and shareholders are also increasingly holding companies accountable for environmental degradation and ethical business practices.

So we've come a long way. But how can we gather further momentum? The transition to One Planet Living will take long-term planning, patience, focus and flexibility as we continue to learn, innovate and

Environment
Environnement
Medio ambiente

Sustainability
Durabilité
Sostenibilidad

Society
Société
Sociedad

Economy
Économie
Economía

implement solutions. In the meantime, we need to ramp up public engagement and debate to reach as many minds as possible, and adapt policy as circumstances change.

We also need to engage more directly with our leaders – particularly in industrialized countries, where footprints are much higher than in less developed nations. For example, if you live in Europe, you will be using more than your share of the planet's capacity even if you choose to ride a bike, recycle and grow your own vegetables, simply because you don't have direct control over decisions dictated by the state, such as transport infrastructure, electricity production and so on. These can, however, be influenced by public discourse and political pressure.

And lifestyle choices do still matter. It can be easy to feel too small to make a difference, but consumers have the power to demand products that meet our needs and reflect our values. And every movement starts with the individual: it all comes down to moment-by-moment choices: how we spend our time and money, our careers, what we eat and wear, how we communicate our values to others and take the lead from where we are with our actions and words. As we experience and demonstrate how pleasurable and rewarding it can be to live sustainably, minds will be changed. Maybe One Planet Living will become known as "common sense" sooner than we think.

Waste to treasure

SANGA MOSES explains how he went from working as a banker to being a green entrepreneur in Uganda, turning agricultural waste into fuel and fertilizer, and organizing reforestation projects.



Photos: Sanga Moses

“I used to work for one of the biggest banks here in Uganda, and that meant that I was away from my home village. One day, on my way to visit my mother, I met my little sister carrying wood. When she saw me, she started crying, saying: ‘I’m supposed to be at school but mother told me to go get wood.’ When I asked mother about this, she said: ‘I’m old and can’t survive without her.’

“This conversation haunted me. My sister was on the verge of losing the only opportunity she had for a better life – education. And there are so many girls like her.

“Uganda has already lost 70 per cent of its forests – and, according to the UN, it will have none left by 2052 if nothing is done. Things have really changed in the last ten years. When I was young, we could care for our cows because the seasons were stable, rains were predictable and we had water in the village. Now droughts are persistent, there’s no water left in the village and we have had to move our cattle away from where we live.

“My first idea was to sell solar cookers. I bought a few and gave one to my mother, but she complained: ‘I can’t use it at night, sometimes the dust blows into the food and when it rains, we can’t eat.’ So I went to see the head of the renewable energy department at Makerere University. From him I learned about using plentiful farm and municipal waste to make clean cooking fuel and organic fertilizers to revitalize soils.

“Together we made two simple things. One is a portable kiln made of an old oil drum. We give these to farmers, and teach them to carbonize and sieve agricultural waste, producing a powder called char. We buy this, and the farmers keep the residues as fertilizer. We also created simple machines to compress char so that it burns in the stoves that people have. No one has to change the way they cook: our fuel looks exactly like wood charcoal, but burns slightly longer and, crucially, is not as smoky.

“We founded Eco-Fuel Africa in June 2010, and now we have 25 full-time staff and a network of 2,500 farmers who produce the char for around \$30 a month. We sell this through 260 women franchisees, each of whom earns about \$5 a day.

“We use some of our income for planting trees. We work with schools, which are very excited about teaching sustainability through scout-like clubs called I Am For Trees, and provide the tree seedlings they need. So far, we’ve planted close to 150,000 trees, but that is just a beginning. Our plan is to expand as quickly as we can to restore Uganda’s forest.

“But, to be honest, I don’t think we can fix the problem alone. We need to keep working with communities to demonstrate our technology, and we need government support, too.”

Sharing is caring: the new economics?

A major evolution is taking place in the ways we create and consume. Such platforms as YouTube, Twitter, Soundcloud, Flickr and Kickstarter already allow us to share video, ideas, music, photographs and money. Now, the trend has jumped offline, with people increasingly sharing, renting and bartering real-world goods, services and experiences – everything from food to cars to rooms in private houses to tools and education – using the internet and social media to facilitate the process. It's the collaborative economy and it's gaining momentum.

So what's driving this? Are we fed up with buying and owning stuff? Are we discovering that experiences and community make us happier than things?

One driver is people's need to save money. People are looking for ways to share instead of buy, and put to use what otherwise might be sitting idle. Another driver is our growing environmental understanding. As more and more of us become aware that we need to be careful with Earth's resources, we're realizing that sharing makes sustainable sense. But one of the most interesting and perhaps unexpected drivers is that people are longing to connect and feel part of a community. Rather than finding fulfilment in shopping, people seem to be finding satisfaction in pooling resources and, in the process, connecting with others and building community.

There are some basic requirements for the system to work. First, it helps to have a resource that can be shared – a seat in a car, a spare room, a rarely used lawn mower, garden



space, a few spare hours and some skills. Look around. You're bound to think of something!

Then there's a communications platform – you could use Facebook, a dedicated website or, for local exchanges, a community bulletin board. But the main currency in the collaborative economy is trust – the faith that no harm will come from hosting a stranger in your house, for example, or that the person giving you a ride is a safe driver. Social networks help facilitate trust, as the number of friends, particularly mutual friends, who will vouch for you serves as a safety net – and conversely you can rapidly spread news of unethical behaviour.

In our materialistic world, the idea that something as intangible as goodwill is valuable may seem strange, but perhaps the rise of collaborative systems is a positive indicator that things are changing.

Sharing is caring: a starter pack

Need a ride?



iCarClub in Singapore, which matches car owners with those who want to "rent" one temporarily, as does OliveTrips in India. This can work where you least expect it – Chile, Iceland, Israel, Oman and Cuba all have

预览已结束，完整报告链接和二维码如下：

https://www.yunbaogao.cn/report/index/report?reportId=5_8959

