

OurPlanet

United Nations Environment Programme

June 2017



Connecting People to Nature

Justin Trudeau
Stepping
up action

David Suzuki
Natural cure

Moritz Kraemer
Nature of risk

Yolanda Kakabadse
The cornerstone
of life

Karma Tshering
Small and beautiful

Lü Zhi
Conserving the
world's roof

UN 
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OurPlanet

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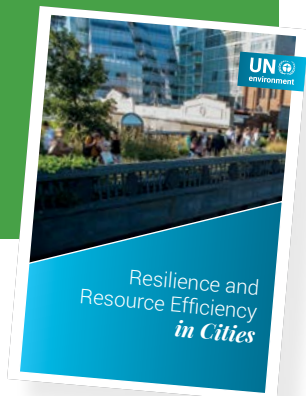
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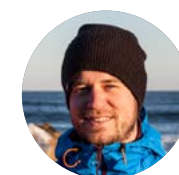
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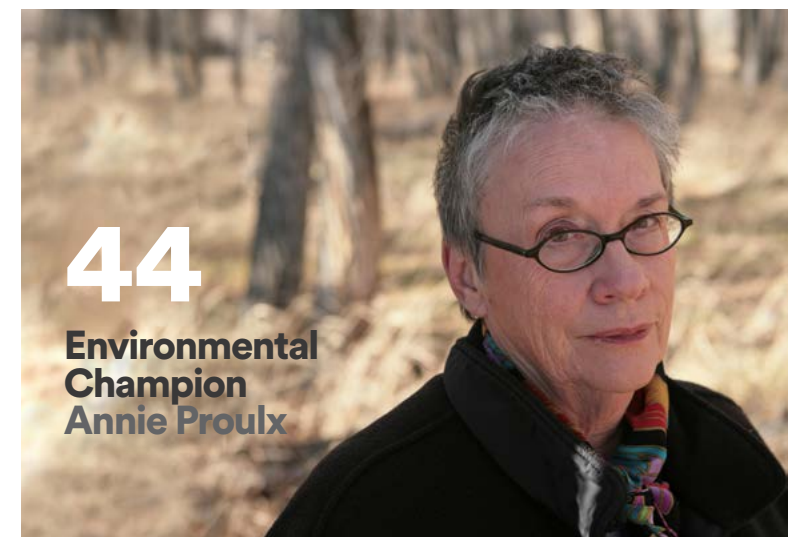
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Reflections



Photo: © Federico Bottos



Erik Solheim

*United Nations Under-Secretary-General and
UN Environment
Executive Director*

The Norwegian countryside is a magnificent playground for a kid. Swing-sets and slides are fun. But for a child, nothing beats striking out into rolling hills and mysterious towering forests. There is adventure everywhere. I have always lived in a city, but I was lucky growing up to have ample opportunity to explore these treasures of Norway.

Some of my favourite memories are from those adventures. I remember the excitement of coming across a clear, gurgling stream. I remember the smell of damp pine after a rainfall. I remember clearings with long grasses, swaying in the wind. The winters were cold, but just as fun. The woods and mountains would retreat under their winter blankets of snow and ice. On sunny days, the light glinting through icicles on the trees was a magical scene. I developed a deep love for nature around this time, which I've carried with me all my life.

As for many living in cities, nature would often feel like something for decoration. There, grass was tamed and cut short, and trees were more

often caged in planters on the pavement. City parks are a refuge, but as work takes over everyone's life, there seem to be fewer and fewer opportunities to enjoy the natural world. That's a problem for everyone in the city. Over half of the planet's people live in urban areas, and urbanization is continuing rapidly. I think most of us city-dwellers will feel sometimes we are losing touch with the environment. But just as we are withdrawing from nature, protecting it has become even more critical.

The trappings of modern life – skyscrapers, smartphones, fast food – are built atop a foundation of complex natural systems. The rivers, forests, deserts, grasslands, oceans, and all of the ecosystems that make up our beautiful world give us what we need to survive and thrive. Without healthy natural systems, our modern life begins to crumble. Yet often these systems are so complex that it's very difficult to comprehend how important they are. A seemingly insignificant change – pollution, deforestation, river rerouting – can cause disastrous effects. We see it with climate

Life is better when we are in touch with our planet. And when we connect with nature, we are letting ourselves understand it, and thereby helping to save it.

change. A small global increase in temperature is causing rising sea levels, more floods and droughts, and species to be decimated. Our natural foundations – the annual rains or the pollinators that make sure we can grow our food – suddenly feel shaky.

Clearly, it's important we safeguard this basis for human survival. But how do we protect all of this if we barely understand the connection? Learning about nature helps, but to truly understand the connection we need to feel closer to it. The sense we get from being outdoors, in the wild, is the sense that we are part of something much larger than us. Almost everyone who has ever set off into the great outdoors on an adventure has felt it instinctively.

That's why this World Environment Day we are asking people to feel that closeness again, to get outside, to connect with nature. On 5 June, go for a hike over the hills, a bike ride through the forest or a swim in a lake. Whatever opportunity you have to get close to nature, do it! And don't stop on 5 June, either.

Life is better when we are in touch with our planet. And when we connect with nature, we are letting ourselves understand it, and thereby helping to save it. I was lucky to find a world full of wonder nearby when I was young. As I grew older I discovered the vast wonder of our world. There is so much to explore, so much to be inspired by, and so much worth protecting outside our urbanized bubble. Let's get outside and enjoy it! ▲



Photo: © CC BY Jan Hammershaug

Justin Trudeau

Stepping up action

Connecting people to nature, connecting the world with Canada.



Justin Trudeau
Prime Minister of Canada

Canada is proud to host this year’s World Environment Day. The United Nations General Assembly first designated June 5 as World Environment Day 45 years ago. Today, it remains a chance to connect with our environment and each other, and to continue to build a more sustainable world for our kids and grandkids.

With Canada celebrating its 150th birthday this year, it’s especially fitting that we will host this year’s World Environment Day. We’re offering free admission to our national parks, marine conservation areas, and historic sites throughout 2017. There’s never been a better time to visit Canada and discover all our beautiful country has to offer.

This year’s theme for World Environment Day, “Connecting People to Nature,” reminds us of the intricate links between land, water, air and all living things. In Canada, nature is all around us. We’re the second-largest country in the world, with the longest coastline in the world, one of the largest supplies of fresh water on the planet, and roughly a quarter of the world’s wetlands. From rainforests along British Columbia’s Pacific coast, to permafrost and tundra in the Arctic, to the hills and lakes of the Laurentians and the red sandstone of Prince Edward Island, our natural landscapes shape who we are as a country. We are blessed to live in such a vast and beautiful land, and this year’s World Environment Day

theme highlights both how important access to nature is for people, and how vital healthy ecosystems are to our global quality of life.

World Environment Day challenges us to leave a cleaner world for our children and grandchildren. Climate change is real. It is here. And it cannot be wished or voted away. That is why our government has taken real, concrete action to address climate change, and to protect our clean air and water.



Photo: © CC BY-NC-ND photo2004



Photo: © Ferdinand Stahr

Canada aims to conserve **at least 17%** of its land and inland waters **by 2020.**

Last year, we introduced the Pan-Canadian Framework on Clean Growth and Climate Change. Developed in partnership with the provinces and territories, and in consultation with Indigenous Peoples, it is Canada’s plan to grow a cleaner, more innovative economy that reduces emissions and protects our environment, while creating good, well-paying middle class jobs.

We also launched the groundbreaking Oceans Protection Plan, which will vastly improve our marine safety and ability to conserve the precious ecosystems of our oceans. With Indigenous and Northern partners, we’re exploring how to protect the future of the Arctic Ocean’s “last ice area” where summer ice remains each year.

Meanwhile, we’ve committed to conserve at least 17 per cent of the country’s terrestrial areas and inland waters by 2020, and to protect and restore our abundant coastal and marine

ecosystems by 5 per cent by the end of this year. We’ll also continue working with federal, provincial and territorial governments to better protect species at risk, and to support recovery efforts and habitat conservation.

I am proud of the work our government is doing – together with partners in Canada and around the globe – to address climate change and build a cleaner, healthier, and more sustainable future. It was an honour to join with leaders from 194 other parties last year to finalize the historic Paris Agreement, which outlines ambitious actions to combat climate change, adapt to its effects, and collectively build a sustainable world. Canada is committed to working with the global community to protect the environment we all share.

While these domestic and international actions mark significant steps to care for our planet, more needs to be done. As the Paris Agreement kicks into action, we must all increase our actions and ambition. In Canada, we recognize the unique contributions that Indigenous Peoples, young Canadians, and communities across our country can make to create concrete and local solutions to respond to climate change, while building a cleaner, more innovative economy. We know we must all step up.

Together, and only together, can we preserve the clean air and water we share, and pass a planet on to our kids and grandkids that is better than how we found it. ▲

Climate change is real. It is here. And it cannot be wished or voted away.

Yolanda Kakabadse

The cornerstone of life

Connecting people with nature is imperative for our shared future and our only planet.



Yolanda Kakabadse
President, WWF International

We are at a crossroads in human history. Our actions are changing the planet in unprecedented ways, and if we carry on as at present the consequences could be disastrous. But, right now, we still have an opportunity to change course. If we come together to take the decisive steps needed, we could chart the way toward a sustainable future where people live in harmony with nature.

Biodiversity underpins the many Earth systems we take for granted, providing us with the air we breathe, the food we eat and the water we drink. It maintains the ecosystems that society and people need if they are to thrive, ensuring access to essential raw materials, commodities and services. And yet, our own actions are driving the planet, its biodiversity and ecosystems to the edge.

We are currently producing, using and consuming food and energy without a thought for tomorrow. Just as with a bank loan, someday someone is going to have to pay the bill.

Protecting the environment alongside economic and social development is critical not just for our well-being but makes economic sense. Producing better and consuming more wisely is key to establishing resilient markets that stay within our planet's safe operating space, safeguard our natural wealth, and contribute to overall economic and social prosperity. It can also help improve financial stability and avoid the implications of resource

scarcity and environmental damage such as floods, storms and drought.

We must be in no doubt of the size of the challenge. In 2016, WWF's Living Planet Report revealed that global wildlife numbers are on course for a two-thirds decline in the 50 years to 2020, due entirely to human activity. Habitat loss, degradation and overexploitation of wildlife have reached unprecedented levels in less than a single lifetime.

In January, NASA and the Met Office confirmed that 2016 had broken the record for the hottest year ever, previously



Photo: © Lisa H



Photo: © CC BY Photo by Olivier Girard / Cliché

Global wildlife numbers are on course for a **two-thirds decline** in the **50 years to 2020**.

held by 2015, which had itself broken the record set in 2014. Natural disasters are becoming more intense and frequent. In southern and eastern Africa, an unusually strong El Niño last year, coupled with record-high temperatures, has left 36 million people living in drought and hunger. And scientists are now warning us that major storms will grow in strength as the world warms and sea levels rise.

But there is (still) a silver lining. If humanity can cause this damage, we can fix it too. Globally, food and commodity production, energy and financial systems need urgent and radical change and this begins with each of us.

Today, we often hear people talk about our hyper-connected world and yet, what we need most of all is to connect with nature, the cornerstone of all life on Earth. Science is one thing, but experiencing and touching nature is what will make it real for people, adults and children alike. We have seen it with pollution where - having witnessed the impact on their health - people are prepared to fight to make changes and pressurize businesses and governments to support them. Now it's time to try and connect with nature on a broader scale - and it could be an experience like none other.

There's nothing quite like being in the wild, high on a mountain, deep in a forest or out on the vast ocean to feel a deep

connection with nature. When we step into nature, we are reminded that all living organisms are connected. But too many of us rarely get to experience this. More and more people live in cities, miles away from nature. How can one expect them to protect something they don't see, understand or love?

It is not easy but it is what we need to do. Nature is as much about lives and livelihoods as it is about wildlife and habitats. Biodiversity provides value to one and all, including the most vulnerable. Only when we truly recognize the interdependence between our demands for food, water and energy and our reliance on the Earth's natural system, can we shift behaviour to value nature.

Take the ocean. Underneath its vast blue surface, its value to our planet and people is almost incalculable. It puts food on the table and underpins trillions of dollars of economic activity worldwide. The ocean also produces 50 per cent of our oxygen, absorbs heat and re-distributes it around the world, and regulates the world's weather systems. Life simply could not exist without these vast marine resources and the goods and services they provide, seemingly endlessly.

But this resource that inspires and feeds us, stabilizes the climate and provides countless other benefits is showing signs of failing health. Pressures such as habitat destruction, pollution and overfishing have been rapidly building for the last hundred years. Today, almost 90 per cent of global fish stocks are over-exploited or fully exploited, leaving very little room for feeding a rapidly increasing human population.

There are definite signs of progress and hope. Over the last two years the world has come together to fight for our shared future. With the Paris Agreement ratified, nations are starting to act on their climate commitments. There's momentum building toward the biodiversity targets set for 2020; the Sustainable Development Goals are focusing efforts to solve the biggest social and environmental challenges of our time; businesses are stepping forward to set Science-Based Targets for action and grassroots movements like Earth Hour are showing us that people are also keen to be a part of global efforts for change. This is a fantastic start, but we need to move faster, aim higher and act with decisiveness and determination to create positive impact.

Protecting the planet starts with individuals and the realization that we are all citizens of one shared home. We need more people to be inspired to love and value the planet in order to protect it. People are intrinsically linked to nature and have been for millions of years: we cannot survive without it. For the first time in history, we know we can destroy our future. But we also know what we need to do to save it - and that together, really anything is possible. ▲

Our actions are changing the planet in unprecedented ways, and if we carry on as at present the consequences could be disastrous.

David Suzuki

Natural cure

By connecting with nature we heal both the world and ourselves.



David Suzuki
*Scientist, broadcaster,
author and co-founder
of the David Suzuki
Foundation, Canada*

This amazing, spinning ball of rock and water, hurtling through space at more than 100,000 kilometres an hour, provides us with everything we need to live and be healthy. It's a delicate balance, with various interconnected natural systems — hydrologic and carbon cycles, ocean and atmospheric currents among them — creating ideal conditions for human life.

If the balance is upset, natural systems will correct and the planet will endure, but those corrections may hinder or halt the ability of humans to thrive, or even survive. You'd think this would be incentive enough for us to learn about and care for natural systems, but recent news sometimes makes me feel as if there's a huge disconnect between people and the planet.

We've altered the physical and chemical properties of the biosphere to the point where we are now the dominant factor influencing Earth's natural systems. That's led some scientists to dub this era the Anthropocene. We've created so many goods and technologies and so much waste that researchers now label the 30-trillion-tonne spread of human creation as the "technosphere". This represents 50 kilograms for every square metre of Earth's surface and is 100,000 times greater than the human biomass it supports!

With global temperatures rising precipitously as we burn more fossil fuels, destroy forests and wetlands and emit

more greenhouse gases into the atmosphere, humanity faces its biggest crisis ever. Climate change threatens our very existence.

Yet, we still hear people arguing that we can't afford to implement environmental safeguards or that jobs and the economy take precedence over protecting the very systems that keep us healthy and alive. We've become disconnected. What can we do about it?

The best way to overcome disconnection is to connect. The eminent American ecologist E. O. Wilson refers to the innate kinship humans feel toward other living beings as "biophilia." We are more likely to care for the things we love and see as important, he argues. If we are to protect the biosphere that keeps us alive, we have to rediscover this innate connection.

The theme of this year's World Environment Day is "Connecting People to Nature." It's an important challenge, especially when you consider that children in the developed world spend less time outdoors than any previous generation. Researchers estimate that the average North American child spends less than 30 minutes a day playing outside, but more than seven hours in front of a TV, computer or smartphone screen. Adults aren't much better. We spend a lot of time in cars, at work, shopping and at home, but very little outdoors. It's time for more green time and less screen time!

The benefits of spending time outdoors are wide-ranging. Studies show that time in nature can reduce stress and symptoms of attention deficit disorder; boost immunity, energy levels and creativity; increase curiosity and



Photo: CC BY Mike Goren

Time in nature can reduce stress and symptoms of attention deficit disorder; boost immunity, energy levels and creativity; increase curiosity and problem-solving ability; improve physical fitness and coordination; and even reduce the likelihood of near-sightedness!

The average North American child spends less than 30 minutes a day playing outside, but more than 7 hours in front of a TV, computer or smartphone screen.

problem-solving ability; improve physical fitness and coordination; and even reduce the likelihood of developing near-sightedness!

Encouraging children to spend more time in nature — and spending more time outside with them — is especially beneficial. A David Suzuki Foundation survey found people who spend time outdoors when they're young are 20 per cent more likely to take part in outdoor programs or to explore nature on their own when they're older.

Nature also builds great memories. I was fortunate in many ways to have grown up before televisions, computers, smartphones and other electronic distractions. My greatest memories are of fishing with my dad, exploring swamps and bogs to collect bugs, frogs and salamander eggs, and hiking in the mountains. Even the time my family spent in an internment camp in the British Columbia wilderness during the Second World War holds fond memories of playing by rivers filled with fish and exploring forests with wolves, bears and deer.



Photo: CC BY Seika

In Japan, they have an ancient term for the beneficial effects of spending time in nature, shinrin-yoku, which means “forest bathing,” or “taking in forest air.” Japanese research conducted in the 1990s found that people who spend time breathing forest air lowered their risk of diabetes and experienced improved mood and lower stress hormone production compared to people exercising on indoor treadmills.

Even getting dirty is good for people. Alan Logan, author of *Your Brain on Nature* – along with experts from a range of disciplines at the Natural Environments Initiative workshop at Harvard School of Public Health – found people who live in areas with rich plant diversity have more diverse microbiomes, the microbial communities on and in our bodies. Beneficial microbes break down food and produce vitamins in our guts. They coat our skin, protecting us from attacks by harmful microbes. The air we breathe, the soil we dig and the outdoor plants we come into contact with include a variety of microbes that may be absent in indoor and built environments.

A microbe common to mud and wet soils, *Mycobacterium vaccae*, influences brain neurotransmitters so as to reduce anxiety and improve cognitive functioning. Another microbe encountered in natural environments, *Acinetobacter lwoffii*, benefits the human immune system, preventing asthma, hay fever and other ailments in children who have been exposed to it — although it can also cause infections and gastric problems for people with compromised immune systems. And research by Ilkka Hanski and colleagues at the University of Helsinki found microbe diversity reduced the incidence of allergies.

Playing in the soil or gardening is fun and relaxing, but it also helps us stay healthy. And whether you’re planting



Photo: © Mi Pham

pollinator-friendly local plants in your garden, making a mud pie, taking photos of wildlife in the forest or sleeping under the stars, you’re developing connections with the natural world and opening your eyes and heart to the amazing, intricately interconnected biosphere of which we are all a part.

What we do to the Earth we do to ourselves. When we harm natural systems, they become unhealthy and, in turn, so do we. Connecting with nature is the best start to restoring the health of our planet and ourselves. There’s no better time to get outside! ▲



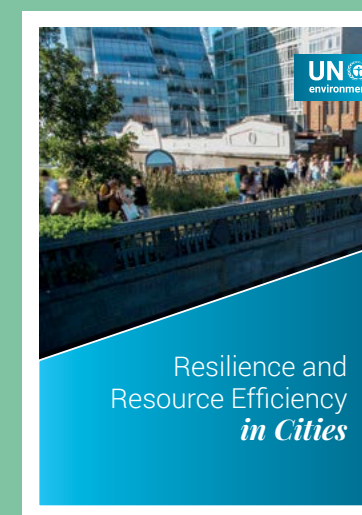
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UN Environment Publications



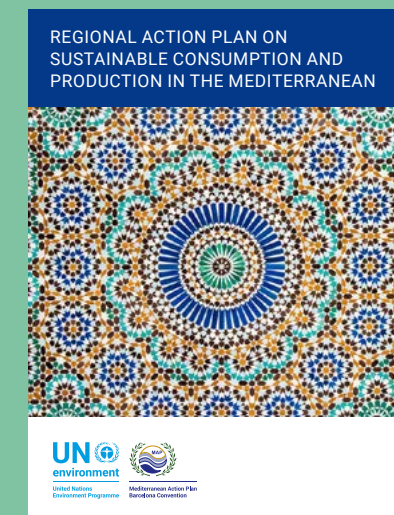
New Frontiers in Environmental Constitutionalism

The book examines new frontiers in the implementation of constitutional, international, and regional rights-based approaches to promote environmental protection. The contributions collected here represent the research of scholars from across the globe who were invited to participate in a Symposium on New Frontiers held at North-West University in South Africa in April 2016 by Professors Erin Daly (Widener University Delaware Law School), Louis Kotzé (North-West University Law Faculty), and James May (Widener University Delaware Law School), and doctoral candidate at the North-West University Law Faculty, Caiphas Soyapi. The symposium was made possible through generous funding by the Konrad Adenauer Foundation. We hope that this publication will help to further the global conversation on comparative environmental rights-based approaches among policy-makers and governments, practitioners, non-governmental organizations, civil society, scholars, educators, and post-graduate students. Finally, we are most grateful to all our contributors from all over the world for sharing their research and work with us. Without them, this publication would not have been possible.



Resilience and Resource Efficiency in Cities

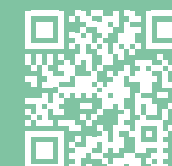
This report looks at the relationship between building the resilience of cities in the face of global environmental change, and increasing the resource efficiency of cities to reduce their harmful impacts on the environment. It provides examples of effective ways to address these agendas, as well as the potential and challenges for integration. This speaks strongly to global policy agendas, including the Sustainable Development Goals, the Paris Agreement and the New Urban Agenda.



Regional Action Plan on Sustainable Consumption and Production in the Mediterranean

The Sustainable Consumption Production Action Plan for the Mediterranean is aimed at supporting the implementation of sustainable consumption and production actions at the regional level to support sustainable consumption and production common objectives. It addresses key human activities which have a particular impact on the marine and coastal environment and related transversal and cross-cutting issues. It defines common objectives and identifies actions guiding the implementation of the sustainable consumption and production at the national level.

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UN Environment at Work

The tricky business of measuring a country's true wealth



Photo: CC BY Nanang Sujana / CIFOR

Human well-being and wealth are not only determined by economic activity but also by the services we get from nature. Gross Domestic Product measures economic transactions, regardless of whether they are positive or negative for human well-being or a nation's wealth. It cannot measure the sustainability of economic activities, and it doesn't capture the contribution of nature to our welfare.

The Inclusive Wealth Index, on the other hand, recognizes that the level of people's health and education, and the natural resources around them, are key elements determining true wealth. Clean water, fertile land, beautiful landscapes, and thriving oceans have tremendous benefits for human physical, social and psychological well-being. We need to respect and take proper account of these valuable assets.

Developed by UN Environment and UNESCO (the United Nations Scientific and Cultural Organization), Japan's Kiyushu University and the UN University, the Inclusive Wealth Index is a new way of measuring wealth and well-being across generations. Its

comprehensive analysis of a country's productive base measures all the capital assets from which well-being is derived. These comprise: natural capital, including ecosystems and the services they provide; human capital, incorporating our health and education levels; and manufactured capital such as factories roads and power stations.

The index calculates a country's inclusive wealth as the social value of all these assets. Steady growth in the index shows that well-being across generations is positive and sustainable.

The index also provides global insights. For example, the 2014 Inclusive Wealth Index found that manufactured capital – for which by far the most data exists – represented only about 18 per cent of the total wealth of nations, compared to human capital at 54 per cent and 28 per cent for natural capital. Yet these two categories are not given the same importance in national accounting systems. It also showed that, of 140 countries assessed, 85 (or about 60 per cent) of them showed positive

average growth in inclusive wealth between 1990 and 2010. However, the gains were lower than those measured by Gross Domestic Product.

One lesson is that investments in human capital, especially education, can generate higher growth in inclusive wealth than spending on other asset groups, especially in countries with fast-growing populations.

The Inclusive Wealth approach provides important new perspective for decision-makers in both the public or private sector. It can guide them towards wiser policies and investments that take into account the importance of natural capital, including the risks that further degradation hold for future prosperity. A number of countries are taking this message on board. Canada, which is hosting the main celebrations for World Environment Day on 5 June, is one of the first to have developed its own index.

The index can help us to understand what is happening to our environment and better plan for the future. By 2030, our growing global population will require 40 per cent more water, 50 per cent more food and 40 per cent more energy. Managing ecosystems in ways that preserve or enhance natural capital will be key to meeting this demand.

As a broad and forward-looking measure of economic, social and environmental strength, the index could also help countries to attract international investment. A high index score will also indicate a country's prospects for meeting the Sustainable Development Goals.

UN Environment and its partners are continuing to develop the Inclusive Wealth Index. Our initial report published in 2012 covered 20 countries. This grew to 140 countries in the 2014 edition, which also benefited from more comprehensive data on human capital. The next edition is due to be published by the end of 2017 and will contain data sets for 190 countries. ▲

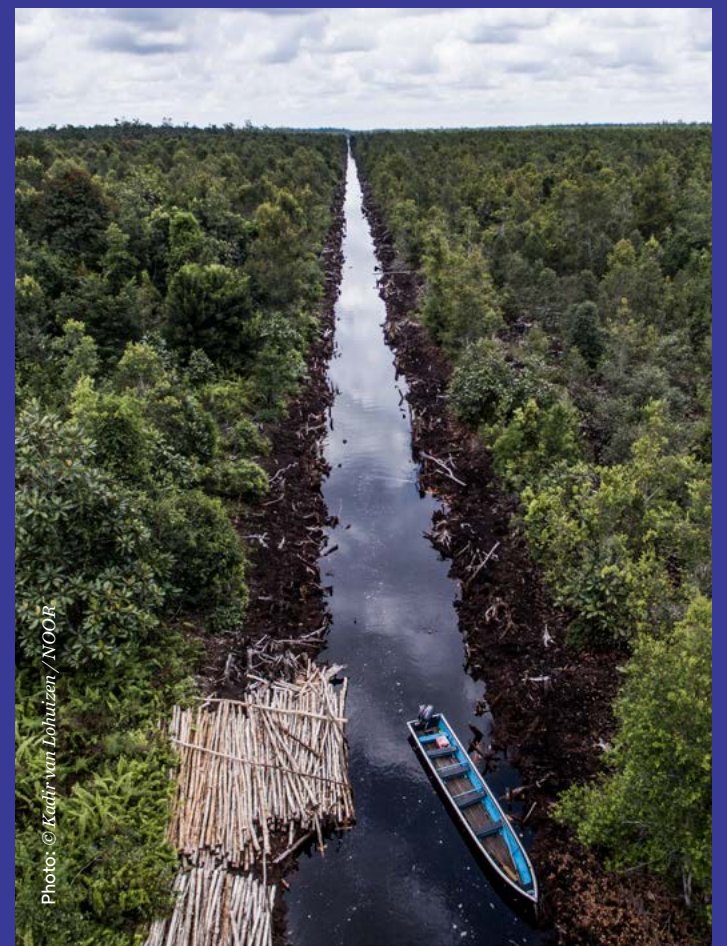


Photo: © Kadir van Lohuizen / NOOR

Over 80 per cent of humanity's true wealth is derived from human and natural capital.

The Inclusive Wealth Index recognizes three different sources of wealth



Karma Tshering

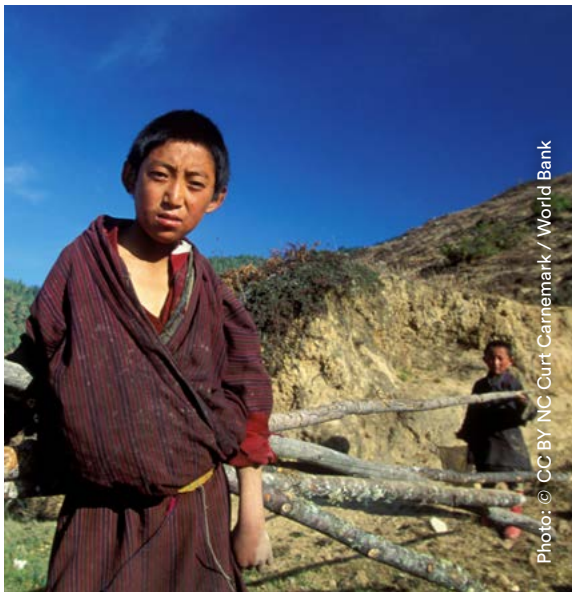
Small and beautiful

How a small Himalayan kingdom’s commitment to nature spurs Gross National Happiness.



Karma Tshering
*Head, Policy and Programming Services,
National Environment Commission Secretariat,
Royal Government of Bhutan*

World Environment Day is very important for Bhutan. We take advantage of it to further enhance awareness of environmental conservation and to bring together communities from all walks of life to show solidarity towards keeping our environment beautiful and healthy. Our small Himalayan kingdom, while pursuing economic development, has taken strong steps to maintain our environment for this and future generations.



Our villagers have learned through age-old traditional practices how to manage the forest and the ecosystem for maximum benefit.

His Majesty the Fourth King of Bhutan bestowed on us ‘Gross National Happiness’ as the country’s development philosophy. This has guided us in maintaining our country’s environment, and in keeping about 71 per cent of it covered by forest. It is a precious gift both to Bhutan and to the global community.

Our culture and traditions have also played a major role in conserving our natural resources. Collecting of broad leaves for livestock, for example, is commonly practiced in almost all the nation’s villages. Some experts have expressed concern about it, taking the view that it has effects on soil erosion, water and the environment – but it seems that our villagers have learned through age – old traditional practices how to manage the forest and the ecosystem for maximum benefit. The collections have helped reduce the hazard of forest fires feeding on dry leaves.



*About **71%** of Bhutan is covered by forest.*

The government has taken several initiatives to protect our forests, including community forestry. This was originally debated within government agencies, but introduced in recognition of the economic benefits it could bring to villagers – and is gaining popularity among them. The concept is simple. Areas of forested government land are allocated to groups of villages. They maintain them and harvest the forest products from them in accordance with management rules and regulations. The economic benefits reduce rural poverty. So the government has been promoting community forestry strongly and villagers are also adopting it on their own initiative.

If Bhutan had wanted, it could have pursued rapid economic development, but our kings realized the negative impacts this would bring not just to Bhutan, but to the global community. Their vision has now been translated into plans and the government is trying to follow and implement sustainable economic development. Our constitution, a gift from the Throne, has a full article on the environment (see box) clearly mandating not just the government but all citizens to protect it.

Though a small country, Bhutan can show the global community how to support the environment. It declared it would remain carbon neutral at the 2009 Copenhagen climate change conference, a huge commitment for a small nation pursuing economic development.

I take pride in describing my country’s commitments and their implementation on the ground and am honoured to be working for the National Environment Commission Secretariat which coordinates environmental conservation with many relevant agencies. We commemorate World Environment Day annually with many events both in the

capital city and in all the country’s 20 districts, with support from different institutions. Since 2013, the secretariat has been observing the event on 4 June to coincide with the birthday of Her Majesty the Queen, the patron of the environment, as well as on 5 June. This year, the celebrations will include:

1. A cleanup campaign in all twenty districts;
2. A ‘Pedestrian Day’ in city centres in all twenty districts, when no vehicles will be allowed in such areas;
3. Launching green hotel guidelines in collaboration with the Tourism Council of Bhutan;
4. The adoption of streams in the districts by different interested agencies to keep the watercourses clean.

We are working hard to protect and conserve our environment, not in order to gain recognition but to show that we can truly live in peace and harmony with nature. ▲

Article 5 of the Constitution of Bhutan

“Every Bhutanese is a trustee of the Kingdom’s natural resources and environment for the benefit of the present and future generations and it is the fundamental duty of every citizen to contribute to the protection of the natural environment, conservation of the rich biodiversity of Bhutan and prevention of all forms of ecological degradation including noise, visual and physical pollution through the adoption and support of environment friendly practices and policies”

Moritz Kraemer

Nature of risk

Natural catastrophes can damage sovereign credit ratings, especially as a result of climate change.



Moritz Kraemer
Managing Director and
Sovereign Global Chief
Rating Officer,
S&P Global Ratings

Conditions are conducive to human life in most inhabited areas much of the time, but nature can strike at almost any moment. When severe natural catastrophes hit densely populated and economically developed areas, these rare events bring large economic costs. They can also hurt a sovereign credit rating, a reflection of a national government’s ability and willingness to honor its financial obligations on time and in full.

S&P Global Ratings has – in cooperation with SwissRe – simulated the economic and ratings impact of natural catastrophes so severe that they are expected to hit a nation only once every 250 years. Based on a sample of 48 countries, the simulations indicate that such natural disasters could weaken sovereign ratings, potentially contributing to governments’ funding challenges, with the biggest ratings impact coming from earthquakes and tropical storms. On average, tropical cyclones are more damaging than floods.

The most severe natural catastrophes could by themselves lead to downgrades of several notches for the sovereigns affected. This is significant: the complete credit rating scale reaches some 20 notches from the top ‘AAA’ to the near-default ‘CCC’ category. One way to mitigate the economic and ratings impact of natural disasters is catastrophe insurance, which could reduce the negative rating impact of severe catastrophes by half if 50 per cent of the damage were insured.

Between 2001 and 2010, according to the World Meteorological Organization, more than 370,000 people died in extreme weather incidents – a 20 per cent rise over the previous decade. Extreme precipitation events have increased significantly at high and middle latitudes in the second half of the 20th century, while tropical cyclones are becoming stronger around the globe. Climate change is expected to continue to make our planet even more lethal, given future trends in coastal urbanization, as rising sea temperatures and levels result in more frequent and more devastating storms and floods, particularly in the tropics. As the planet gets warmer, natural catastrophes are likely to become yet more frequent and severe. The detrimental impact on credit ratings will be ratcheted up as well. But by how much?

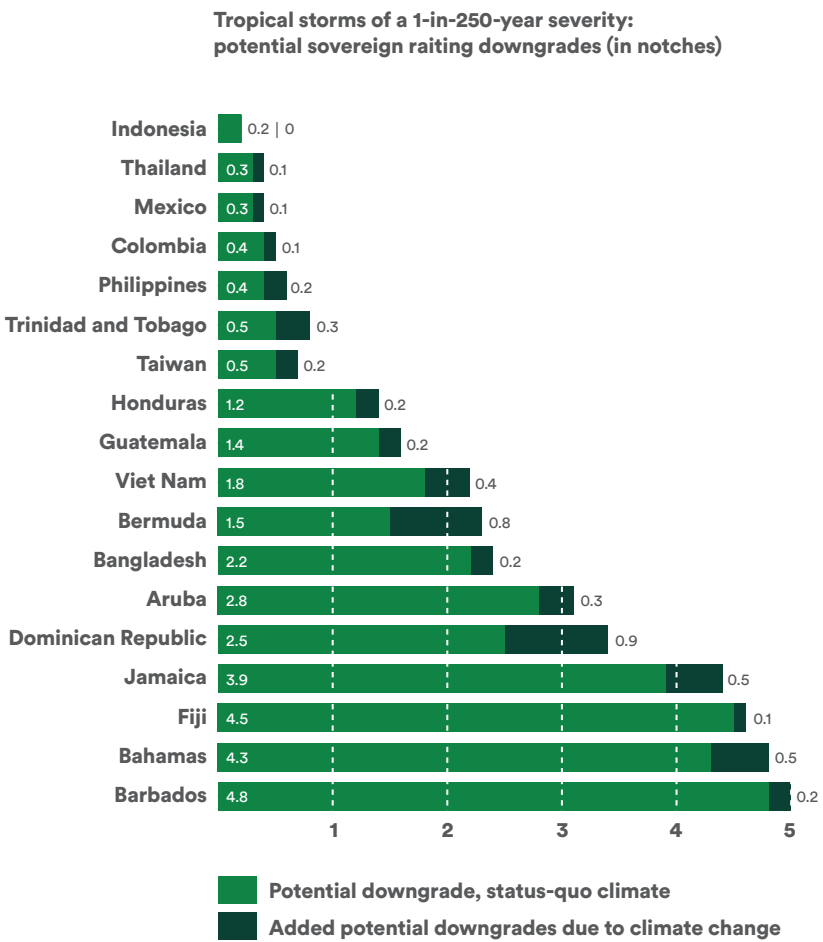
Poor countries are already significantly more at risk than rich ones. This can be due either to existing economic and financial vulnerabilities or to the underdevelopment of an insurance market. Latin America and Caribbean sovereigns in this report had the highest average rating decline, followed by Asia-Pacific, where the ratings could also come under pressure. The average impact for European and North American sovereigns, however, was negligible at present and did not point to outright downgrades in sovereign ratings.

The impact of climate change is also most harmful for emerging and developing sovereigns, and much less so for advanced economies. The most notable ratings risks due to climate change will be from cyclones in the Caribbean and Vietnam and floods in Thailand, where the impact of climate change doubles potential flood damage.

Some countries will be able to adapt to the challenges associated with climate change. But the speed of change could



Natural disasters could weaken sovereign ratings, potentially contributing to governments’ funding challenges, with the biggest impact coming from earthquakes and tropical storms.



Source: S&P Global Ratings

be so rapid as to make this all but impossible for the most vulnerable nations in Asia, Africa, the Caribbean, and elsewhere in the developing world. Even advanced sovereigns are likely to see significantly raised potential direct damage from climate change. Tropical cyclones in the US, New Zealand or Japan would raise it by between one half and two-thirds, albeit from a lower base than for Caribbean economies. The rising impact of floods in Europe, however, appears quite small.

The chart demonstrates how global warming exacerbates the risk to sovereign ratings from tropical cyclones. The light green bars show the likely number of notches a sovereign would be downgraded if a once -in-250-years storm hit national territory under current climate conditions. The added dark green bars show the additional effect of such a storm under the climate conditions expected in 2050. The risks to governments’ solvency rises hand in hand with the planet’s temperature. Again, the most impacted sovereigns are in the developing world, especially in small, geographically undiversified and densely populated tropical nations. The additional damage caused by climate change in richer countries is, on average, more moderate. Their higher level of preparedness, including insurance coverage, further reduces economic and rating impacts there.

Drought and some other hazards related to climate change, including social upheaval and migration, have been excluded due to limited data. But they too can affect lives and economic activity, especially in low-income developing sovereigns with important agricultural sectors. The results presented here should therefore be understood as merely a partial analysis of how climate change would affect sovereign ratings, and the negative effects may turn out in practice to be even more significant. ▲

Lü Zhi

Conserving the world's roof

Co-existence between people and nature on China's Tibetan Plateau.



Lü Zhi

Professor, Peking University and Founder, Shanshui Conservation Center

It was a chilly February day. Dangwen and his wildlife monitoring team from the village of Yunta patrolled along the upper reaches of the Yangtze River. The river was frozen solid, easy for poachers to walk over. That day, they encountered 220 blue sheep, five white-lipped deer, and a line of otter footprints. On the infrared camera traps that they had set up throughout the valley, three snow leopards appeared, a mother and two cubs – and the cubs had grown much bigger than three months before.

Yunta is in Sanjiangyuan in Qinghai Province on the Tibetan Plateau, where the Yellow, Yangtze and Mekong rivers rise. Having grown up in the village, Dangwen is very familiar with the land, the river and the wildlife, and especially proud of its sacred mountains that shelter abundant wildlife. A few years ago a mining company attempted to prospect the area. The villagers were deeply disturbed because mining the mountains would go against the spiritual values of Tibetan Buddhism and threaten their safety.

So when a young man from the Shanshui Conservation Center, a Beijing-based non-governmental organization, arrived to discuss the idea of organizing villagers to monitor wildlife and protect their lands, Dangwen agreed without hesitation. This is now the fourth year that Yunta villagers have carried out this monitoring, patrolled the village against poachers, and managed garbage to keep the

land and rivers clean. The monitoring data shows that local wildlife populations, including snow leopards, are increasing. The villagers' conservation conduct is officially authorized by the local government – their stories have been reported by China Central Television – and the mining company never returned. Inspired by Yunta, four neighboring villages began their own wildlife monitoring and anti-poaching patrols. With encouragement from local authorities, a village-based conservation network is being formed along the Tongtianhe Valley.

Yunta is a pilot village initiating community-led conservation in Sanjiangyuan, the 400,000 square kilometre area that serves as an important habitat for rich and unique biodiversity and a watershed of the three largest rivers in Asia serving a billion people downstream. It has been recognized as a conservation priority in China. A Sanjiangyuan National Nature Reserve was set up in 2003 and a National Park designated in 2016. Yet the area faces big conservation challenges: government agencies have limited manpower to manage this vast area and grazing rights to all its grasslands were given to households in the 1900s.

This means that conservation in Sanjiangyuan would not be possible without support from local Tibetan communities. Fortunately, as Buddhists, these communities embrace the value of respecting nature and caring for other living beings: their system of sacred lands is very similar to modern protected areas. They are natural allies for conservation. Yunta's experience has proven that, with proper training, villagers can become very qualified conservationists. Essentially they are providers of ecological services and should receive benefits from conservation in return.



After three decades of fast economic development in China, a better environment is becoming a higher priority.

Based on this experience, a policy recommendation was made to the government, and the newly designated Sanjiangyuan National Park quickly responded. A total of 16,400 jobs as guards, with monthly salaries of 1,800 yuan (about \$260), are to be offered to villagers living inside the park (one per household). The next step is to explore the possibilities for reducing grazing in key habitats so as to allow wildlife – especially large carnivores such as snow leopards – to increase, and to slow down grassland degradation.

The Tibetan Plateau is the last place in Asia that still maintains a relatively intact ecosystem where large carnivores and ungulates, many unique to the region – such as the snow leopard, the Tibetan brown bear, the Tibetan antelope, the wild yak, the Tibetan wild ass, the Tibetan gazelle, and the blue sheep – roam freely. Maintaining this vast ecosystem is challenging because its population of pastoralists is rapidly increasing. The human population of Sanjiangyuan has doubled since 1980. Meanwhile global climate change may have added to pressures on the grassland. Is it possible, under these conditions, to protect the

ecosystem successfully while supporting the cultural and economic well-being of Tibetan communities?

We remain hopeful. Over the past two decades, the conservation awareness of governments and civil society in China has boomed. After three decades of fast economic development, and demands by the Chinese people and government, a better environment is becoming a higher priority. Several large ecological programs have been initiated – perhaps among the largest financial schemes in the world – to pay for protecting and restoring forests, grasslands and wetlands, though their effectiveness could be improved by more scientific planning and participation. The urge for nature education from citizens, especially parents, is rapidly growing, and this has generated broad concerns over ongoing ecological degradation. Public participation in conservation is now protected by environmental laws. Political will, the interests of society, and traditional values are all coming together. This makes us believe that co-existence between humans and nature is not just wishful thinking. Yunta, indeed, offers a starting point. ▲

16,400 people
from villages inside
Sanjiangyuan
National Park will be
employed as guards.

Everything is connected to nature

We are all connected with nature. From the air we breathe to the technology that makes us productive, we depend on nature for just about everything. Sometimes that relationship is obvious, but sometimes you might not realize the natural source of a product or service. Appreciating those resources and using them sustainably will ensure that they are still available for future generations.

Sand and gravel are the most extracted materials in the world, accounting for up to

85%

by weight of everything mined globally each year

Global sales of pharmaceuticals based on materials from natural origin are worth

US\$75 billion

a year

Worldwide, over
1 billion
people are employed in agriculture

It takes up to
3,000
liters of water to produce a beef patty for a hamburger

Hydropower supplies
16.4%
of all electricity worldwide

Up to
9%
of the wood used to make paper is harvested from old growth forests, which are impossible to replace because of their maturity

Your mobile phone contains up to
16
out of the 17 rare earth elements, for which no adequate replacements exist yet

Around
a third
of the world's largest cities obtain a significant proportion of their drinking water directly from protected areas

Taking part in nature-based activities can contribute to reducing levels of anxiety, stress, and depression

Nearly
70 million
barrels of oil are used each year to make the world's polyester fiber, which is now the most commonly used fiber in our clothing

Gunter Pauli

Recreating the commons

How a new generation of entrepreneurs who work with nature can transform cities and economies.



Gunter Pauli
Author of The Blue Economy and Founder of Zero Emissions Research and Initiatives (ZERI)

When I presented core concepts and findings on local economic development as a possible report to the Club of Rome under the title “The Blue Economy: 100 innovations, 10 years, 100 million jobs,” in April 2009, I sketched out a vision. This was based on an understanding that nature in general – and a wide range of ecosystems in particular – has overcome nearly every imaginable challenge over the past millions of years, and therefore provides an inspiration for how society can chart a pathway towards the future.

We can build on the ingenuity of ecosystems that provide the wealth of products and services on which life depends, and then strengthen the social systems that build up culture, tradition, and social capital. This approach provides resilience in adverse times and joy during the better moments of our lives. It also permits us to learn how to live within obvious limits while evolving from scarcity to abundance.

Observing ecological and social systems over decades can guide our quest towards a world where nature regains its evolutionary path and society strengthens its social web, enhancing everyone’s quality of life by empowering them to know how to respond to their basic needs with what is locally available. This challenge has become even more relevant in an urban context. How can we achieve a fast transition from traditional business and economic development to an economy that would perform better and transform agriculture and industries faster than often has been considered viable?

These past eight years have taught me many lessons and permitted me to better understand the fundamental shortcomings of the existing economic model, where practice differs greatly from theory, and where a simple focus on core business based on a core competence has blinded many to seeing the wide portfolio of opportunities that we could pursue. The management of companies with short-term objectives – translated into financial terms void of social and environmental considerations – considers the commons as a place to exploit (as we do with excessive water consumption) or to release our excesses (as we do with the release of greenhouse gases into the atmosphere). How can we believe in Adam Smith’s “invisible hand” of the market when self-interest faced with scarcity is bound to lead to destructive behaviour?

Modern society has believed in the freedom to exploit the commons, and has offered companies a license to act accordingly. We have confused the free market with the free exploitation of the commons. Now we realize that the freedom to add extra sheep to graze on public land leads not just to overgrazing but to soil erosion, loss of water retention, and desertification. Thus, freedom to pursue one’s own interests leads to the destruction of the very basis of the ecosystem that supports life. The laissez-faire approach that has been applied to the market is unknowingly applied to the commons too. This reality is widely recognized for ecosystems, but few have noted that the commons in cities suffer even more, because space is so limited, the air so dense, and the water so scarce.

The key for business is not to grasp the latest strategy for cost reductions, the newest technology of the Internet of Things, or the return on investment that pleases shareholders beyond expectations. Rather, business urgently needs to rethink its model of operations. That is what entrepreneurs do so well. By the same token cities need to rethink the way the commons are designed so their universal use can be ensured. We need business models that enhance and secure



Cities need to rethink the way the commons are designed so their universal use can be ensured.

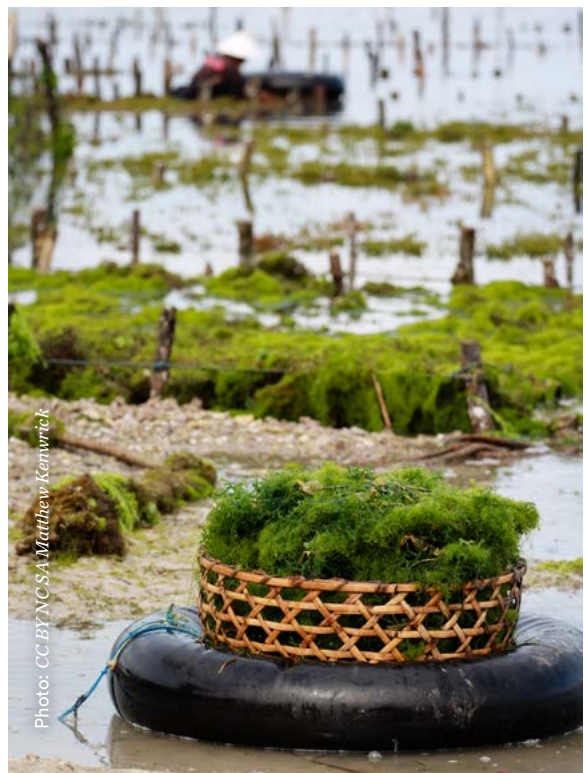
not just “the functioning of the market”, but strengthen the very conditions on which life depends. For the past few decades, the search has focused on how to design a business that is capable of responding to basic needs while ensuring that the commons thrives, and still offering a return.

We in the think tank of the ZERI Network – created in 1994 in Japan at the United Nations University with the support of the Japanese government in preparation for the Kyoto

Protocol – and in the “do tank” known as the Foundation for the Blue Economy – which emerged after the publication of my Report to the Club of Rome under the same title, harvesting the insights and experience of fifteen years of academic and field research – have learned that community can be created, and that sharing is possible.

The ZERI Network has so far implemented over 200 projects; witnessed how investments of \$5 billion were channeled into projects that turned mining waste into mineral rich “stone paper”, cleaning up regions of China; produced natural gas and fertilizer from seaweed platforms that regenerate biodiversity in Indonesia; transformed thisles into green chemistry using old petrochemical facilities in Italy; and encouraged 5,000 start-ups on four continents converting coffee waste into mushrooms. Thanks to entrepreneurs who rapidly took these ideas to scale we see light at the end of the tunnel.

We envisage a radical transformation, creating an economy that embraces the commons, where technologies may be patented, but the business model is shared as an open source. In this economy, jobs are created in cites, and waste turns into one of the most precious sources of life: soil, which regenerates more life, food, and indeed abundance. This approach is disruptive for existing businesses, who may well react in traditional ways to this threat to do much better with what we have. But we are convinced that there is no stopping the wisdom of the people or the unleashing of entrepreneurship because, yes, we need to wake up the innovator within us, and know that we are the ones who make decisions. The future of air, water, health, topsoil, biodiversity, and clean energy, can be based on design principles for cities and economies that live and let live, use all that is locally available, moves, recycles, senses, and shares. ▲



Beth Rattner

Alive to solutions

Unlocking nature's design lessons helps meet the challenges of sustainability.



Beth Rattner

*Executive Director,
Biomimicry Institute*

In 2015, engineering student Jorge Zapote and his team from the University of Calgary decided to take on a problem that affects millions of poor, rural families around the world – and one whose solution could be key to remedying climate change. They wanted to find a low-cost way of keeping fruit and vegetables cool and fresh in low-resource settings without using electricity.

In his recently released book *Drawdown: The Most Comprehensive Plan Ever Proposed to Reverse Global Warming*, Paul Hawken concludes that the most important way to reduce greenhouse gases by 2050 is to phase out chemical refrigerants – and that cutting food waste ranks third among solutions. So creating an electricity and chemical-free refrigerator that prevented food waste would be a big step towards reversing global warming. But how even to begin to design a device that would help solve such pervasive, complicated issues?

Using biomimicry – an innovation approach that looks to living systems for clues on how to create sustainable, life-friendly designs – Zapote and his team created WindChill, a low-cost, electricity-free way to store fresh food. By studying and emulating how coral, kangaroos, elephants, and meerkats regulate temperature, they were able to develop a device that uses a combination of outside air, water, and an evaporation chamber to keep food cool. The design won first place in the 2015 student Biomimicry Global Design Challenge, and they are

now working to bring their design to market in the Biomimicry Accelerator, a program developed by the Biomimicry Institute and sponsored by the Ray C. Anderson Foundation.

This is just one of thousands of examples of how innovators are unlocking clues from the living world to rethink how we design products, materials, and systems. Biomimicry provides a new lens that clarifies a path toward sustainable – maybe even radically sustainable – design. Instead of toxic dyes, biomimicry shows us how to create colour using nanostructures, just like the wings of the beautiful morpho butterflies or the hair of the blue tarantula. In place of fertilizer and chemicals, biomimicry points to mimicking how some plants in harsh, mountainous regions pave the way for new species to grow. And living organisms can also inspire entrepreneurs to come up with more efficient, lower-cost technologies, such as NBD Nano's surface coating solutions inspired by water-repelling and water-attracting structures on the body of the Namib Desert Beetle. There is no end to what we can come up with if we learn how to tap into nature's treasure trove of answers.

At the Biomimicry Institute, we like to say that we want everyone to become “bio-lingual” – not just to respect living systems, but to understand how to apply lessons from them to improve the health of the planet. We are seeing proof of how biomimicry can be a game-changer for sustainable design solutions through the entrepreneurs with whom we are working in the Biomimicry Accelerator. Over the past two years, we have trained, mentored, and funded teams of innovators from over 13 countries working on early-stage designs to address big sustainability issues. They credit biomimicry for taking their designs to the next level.



Photo: CC BY Renée



Photo: CC BY SA Rusten

Instead of toxic dyes, biomimicry shows us how to create colour using nanostructures, just like the wings of the beautiful morpho butterflies or the hair of the blue tarantula.

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Another of the 2015 Accelerator teams, for example, created the low-cost, solar-powered Oasis Aquaponic Food Production System to help subsistence farmers grow more food in a smaller space, using less water and energy. Without a redesign informed by a biomimetic approach, their design would have been too costly for their targeted audience. “I’m not sure that we would have gotten here without biomimicry,” said Oasis team member Michelle Leach. “We started doing this process of evaluating things from a biomimicry perspective and that gave us a new vantage point. That was really necessary for us to take this next step and develop the system as it is today.”

Even if you aren’t poised to create the next game-changing, nature-inspired innovation, it’s crucial to understand just how much the natural world can teach us about how to live sustainably. As biologist and writer Janine Benyus – author of *Biomimicry: Innovation Inspired By Nature* – writes,

“There’s nothing like trying to emulate a leaf to make you tremble the next time you walk through a forest.” By reconnecting to nature and tuning into the lessons tucked away in a leaf, a gecko’s foot, an ant colony, or the soil beneath us, we not only get glimpses of how we humans can be smarter about the things we create and their impacts on the planet but also understand that we must protect these teachers at all costs.

We’re just beginning a colossal shift from technologies and systems that ransack the dwindling supply of natural resources to ones that tread lightly on – or even restore – our shared planet. Nature contains millions of time-tested examples of technologies that run on renewable energy, use life-friendly materials, are locally attuned, and reward cooperation. The good news is that all the tools and inspiration we need are right outside our doors, if we can learn how to look for them. ▲

Rachel Kaplan

Attention! That's a precious resource

Connecting with nature sustains our effectiveness and fosters reasonableness and clear-headedness



Rachel Kaplan

*Emerita Professor
of Environment and
Behavior, University of
Michigan*

There was no need to implore our forebears to get outdoors and be in nature. Presumably these ancestors also rarely experienced any gap between what was interesting in their environment and what was important to attend. But the times are ever-changing. Today these two vectors – the important and the interesting – are often at odds as inordinate amounts of information, and the ease of accessing it, dominate our swirling world.

We depend on the information, and often crave and cherish it. At the same time, however, much of it is irrelevant or even misleading. Sometimes it is terrifying and too often it renders us helpless. Its constancy and intensity comes at a substantial cost to us both personally and interpersonally. In subtle yet persistent ways, it affects our health, our effectiveness, and our capacity for reasonableness.

Herbert Simon, the Nobel Prize-winning economist, portrayed that cost in 1971 with his insight that: "In an information-rich world, the wealth of information means a dearth of something else: a scarcity of whatever it is that information consumes. What information consumes is rather obvious: it consumes the attention of its recipients. Hence a wealth of information creates a poverty of attention and a need to allocate that attention efficiently among the overabundance of information sources that might consume it."

For most of us it is probably not obvious that what is being consumed by our wondrous, buzzing world is our attention.

Nor are the consequences of that theft readily recognized. Heeding Simon's advice to allocate our attentional resources "efficiently" requires that we are aware of them as assets and that we know when they are depleted. If we knew all that, could we be more selective in how we spend this limited and precious resource? Could we perhaps even defend against the depletion? Attention Restoration Theory (ART), a framework originally developed by my colleague, and husband, Stephen Kaplan sheds light on these issues.

ART draws on the distinction made by William James, the nineteenth century philosopher and psychologist, between two kinds of attention in terms of the effort they require. The first, Directed Attention, entails information that obliges us to direct our focus or to "pay" attention. James contrasted that with what we might call Effortless Attention, information that is so compelling that it is difficult to ignore. Much of what has been important throughout the vast majority of human evolution – wild animals, danger, caves, blood – was innately interesting, and thus required little reliance on Directed Attention.

The distinction between Directed and Effortless Attention turns out to have dramatic consequences for issues at the heart of World Environment Day – and especially for this year's theme of "connecting people with nature." Connecting with nature – and appreciating our dependence on it – provides a path to sustaining our effectiveness and fostering reasonableness. ART explains the role of attention in bringing these seemingly unrelated concepts together.

Directed Attention is essential for pursuing all that demands our attention. We use it to focus on the task at hand. It is also critical to ignoring or suppressing the ever-present distractions of our contemporary information-rich world. Our lives require us to juggle multiple demands, monitor what we do or say, check on diverse sources, and manage the wealth of information we are dealing with. This all requires ceaseless mental effort.



Connecting with nature offers many ideal ways to replenish fatigued attentional capacity.

ART posits that Directed Attention is a finite resource and that it fatigues. We commonly call the resulting decline "mental fatigue," but it is not the mind or the brain that is fatigued. Even while experiencing mental fatigue we can, and do, pursue many activities – for instance: go for a walk or ride, hang out with friends, read a novel, watch television, or play games. Pursuing some of them, however, may be counterproductive in terms of restoring attention.

How then can we humans recover the attentional resource we so readily deplete? ART points to the second attentional system – the effortless kind – as critical for reducing mental fatigue by freeing us from directing our attention and thereby allowing it to replenish. Many environments, situations, and activities that call on Effortless Attention have an intrinsic fascination that makes us feel in tune with our surroundings and leaves room for the mind to wander. They allow for reflection and enable clear-headedness. Stephen Kaplan referred to such places as having 'soft fascination' and conjectured that this is particularly conducive to restoring attention. Incorporating opportunities for soft fascination in our lives can reduce the mental clutter that results from the constant information that draws on our Directed Attention.

Soft fascination can be found in many contexts. The press and many publications offer numerous stories documenting the

wide array of benefits offered by one category of them: connecting with nature. Breathtaking, pristine places and long lasting encounters in faraway places may offer needed tranquility, but an abundance of research has demonstrated that "everyday nature" can also provide restorative benefits and permit recovery from attentional fatigue. Such restorative opportunities can be achieved even in mini-doses, as in a view of trees from the window. Nurturing a garden or taking a nature walk near home can also provide the needed connection.

ART thus provides a framework for understanding some of the benefits that engaging with nature can play in our lives. Mental fatigue is rampant; we all experience it frequently. Unbeknownst to us, however, we readily undermine our efforts to recover from what we call stress. Spending hours engaged with the virtual world or watching television may be entertaining, but may also add to our internal noise rather than permitting it to dissipate. It is easy to confuse restoration with the seduction and excitement that screen time provides. By contrast, nature allows the mind to wander. It allows space to process lingering thoughts. Such reflection contributes to clear-headedness. It may bring what is interesting and what is important into better balance.

Humans depend on information, but its constancy entails a severe cost to our finite attentional capacity. The consequences of such depletion – irritability, distractibility, impulsivity, and reduced effectiveness – manifest themselves in loss of civility and reasonableness. Even if we are not aware of it, connecting with nature offers many ideal ways to replenish fatigued attentional capacity and facilitate clear-headedness. Consequently it is in our self-interest not only to engage with nature, but to assure that opportunities for such engagement will continue to sustain the human community. ▲

UN Environment at Work

Cutting poverty by fostering environmental sustainability



Forests, lakes, rivers and fertile land provide income and employment for many men and women living in Africa. But unsustainable use of these resources can trap them in poverty. One way to reduce poverty and catalyse change is by producing and using evidence that brings together the environmental, economic and social dimensions of development. This is the so-called integrated approach to sustainable development.

The Poverty-Environment Initiative, a joint project of the United Nations Development Programme and UN Environment, has supported 28 African countries in adopting such an integrated approach to sustainable development since 2005.

In Malawi, for example, the project's studies and insights have helped the government re-orient its agricultural policy towards sustainability and women's empowerment.

The project's insights have helped the Malawi government re-orient its agricultural policy towards sustainability and women's empowerment.

One report found that the unsustainable use of natural resources is costing the country 5.3 per cent of its Gross Domestic Product, equivalent to \$191 million every year.

By contrast, investing in environmental and natural resource sustainability can yield high rates of social and economic returns: A 1 per cent (\$300,000) increase in public expenditure on the sustainable management of natural resources could increase Malawi's Gross Domestic Product by \$17 million every year, the Initiative estimated in 2016.

Dopa village in northern Malawi, where the Initiative carried out a case study, exemplifies the complex relationships between poverty and environmental factors.

Most people in the village live from agriculture, but yields are below potential, due partly to soil erosion and loss in soil fertility. Deforestation on the hills surrounding the village is a related problem. On the one hand, the wood provides another source of income and helps to meet energy needs. On the other, deforestation has led to landslides during the rainy season, exacerbating soil erosion and its vicious cycle of reduced productivity, food insecurity and poverty.

In Malawi, soil loss alone has reduced agricultural productivity by an estimated 6 per cent. At the same time, addressing the issue of soil erosion in a 10-year period could have lifted 1.88 million people out of poverty through increased agricultural yields. A 2016 Soil Loss Assessment for Malawi, however, helps chart a way forward. The assessment "can inform how we design more sustainable land management interventions to combat soil erosion," says John Mussa, Director of Land Resources and Conservation Department, from the Ministry of Agriculture, Irrigation and Water.

However, there are practical challenges. For example, in Malawi the government in 2015 temporarily dropped its indicator on soil loss and nutrient use because of insufficient information on base-lines, and lack of staff capable of monitoring soil loss trends. Low capacity to monitor environmental trends and its poverty and economic implications is a real challenge in many countries and will be an important barrier to overcome to monitor progress towards the Sustainable Development Goals.

An integrated approach also implies looking at social factors. Malawi's women-headed farms, for instance, are found to be 28 per cent less productive than those headed by men, with economic and social implications. Empowering women farmers to be as productive as men - for example by giving them better access to credit - would increase crop production by 7.3 per cent and thereby enhance food security. That would imply gross gains to annual Gross Domestic Product of \$100 million and could lift as many as 238,000 people out of poverty, according to the Initiative.

This would be good for the environment too, as low productivity levels lead to more intensive land use, perpetuating a cycle of environmental degradation.

"I see [these findings] as a strong tool to begin to translate the Sustainable Development Goals, and more specifically Goal 1 on eradicating extreme poverty for all people," said Allan Chiyembekeza, then-minister of agriculture, irrigation and water. Inspired by the evidence, Malawi's 2016 agriculture policy has a strong focus on sustainable agriculture and women's



empowerment. The policy aims to enhance investments in climate-smart agriculture, strengthen sustainable land, soil and water management while promoting women's access to, and ownership and control over, productive and financial resources.

"Our experience in Malawi shows the importance of adopting an integrated approach to sustainable development and putting in place policies that foster sustainable use of natural resources and empower women so that we can increase agricultural productivity," says Moa Westman, a UN Environment expert working on the Initiative.

When a sector - in this case, agriculture - understands how the unsustainable use of the environment makes it harder to reach its own targets as well as broader social equality and economic goals, the motivation to adopt an integrated approach can be high. There is much to learn from the Initiative's findings. With this in mind, it will publish a report in June 2017 pulling together the lessons from its experiences in Africa. ▲

Richard Louv

Telling a powerful tale

A manifesto for a new nature movement.



Richard Louv

*Co-founder and Chairman
Emeritus of the Children &
Nature Network.*

To change a society, as the philosopher Ivan Illich wrote, “you must tell a more powerful tale, one so persuasive that it sweeps away the old myths and becomes the preferred story, one so inclusive that it gathers all the bits of our past and present into a coherent whole, one that even shines some light into our future so that we can take the next step...”

So, today, how do we shine that light? Politics can destroy the story, or our story can transcend politics.

During the past decade, thousands of individuals and organizations have worked to reconnect children to the natural world. This represents one of the few concerns in America that brings people together across partisan and religious lines.

We must continue to support the birthright of all children to a healthy environment and to a connection to the natural world, and to teach the responsibilities that come with that right.

We can work to reduce climate disruption and the collapse of biodiversity by opposing policies that destroy people and the rest of nature, and by making the case that human beings protect what they love and love only what they know. More than ever, building a future generation of conservationists will depend on helping children and adults fall in love with the natural world.

We can emphasize the healing powers of the natural world: for mental and physical health; for the capacity to learn and create; and for reducing violence. We can promote family nature clubs, and similar approaches, as ways to seek meaning and solace in a difficult and alienating time. We can offer a little Vitamin N for the soul through places of worship. And we can encourage pediatricians, psychologists and other healthcare professionals to prescribe nature.

We can pursue “natural cultural capacity,” illuminating the wealth of ways that different cultures connect to nature. We can reach out to people in the food movement,



Photo: CC BY-NC-ND Daniel Tiveau / CIFOR



Photo: © Abigail Keenan

Building a future generation of conservationists will depend on helping children and adults fall in love with the natural world.

to community organizing groups in urban and rural neighborhoods, to military families and immigrant organizations.

We can create and renew nature-rich cities to serve as incubators of biodiversity and habitats of health. Local institutions, such as libraries, zoos, aquaria, and nature centers, can become centers of bioregional awareness and nature-connection for children and families. We can help build a new generation of nature-based schools, increase the number and quality of natural schoolyards, and redouble our efforts to honor Natural Teachers as individual agents of change. With the support of education and business, we can nurture the development of careers that connect people to nature, new jobs irreplaceable by technology.

And as the human species continues to urbanize, we can strengthen our international efforts. We can seek solidarity in a movement that will grow, regardless of national politics. Worldwide, we can tell a new story of a nature-rich future to counter the post-apocalyptic vision of the future so widely accepted.

Here is what we cannot do: heal every hurt or prevent every tragedy. But surely, in the words of the poet Aeschylus, we can do what we can, in the limited lifetime we have, to “tame the savageness of man and make gentle the life of this world.” ▲

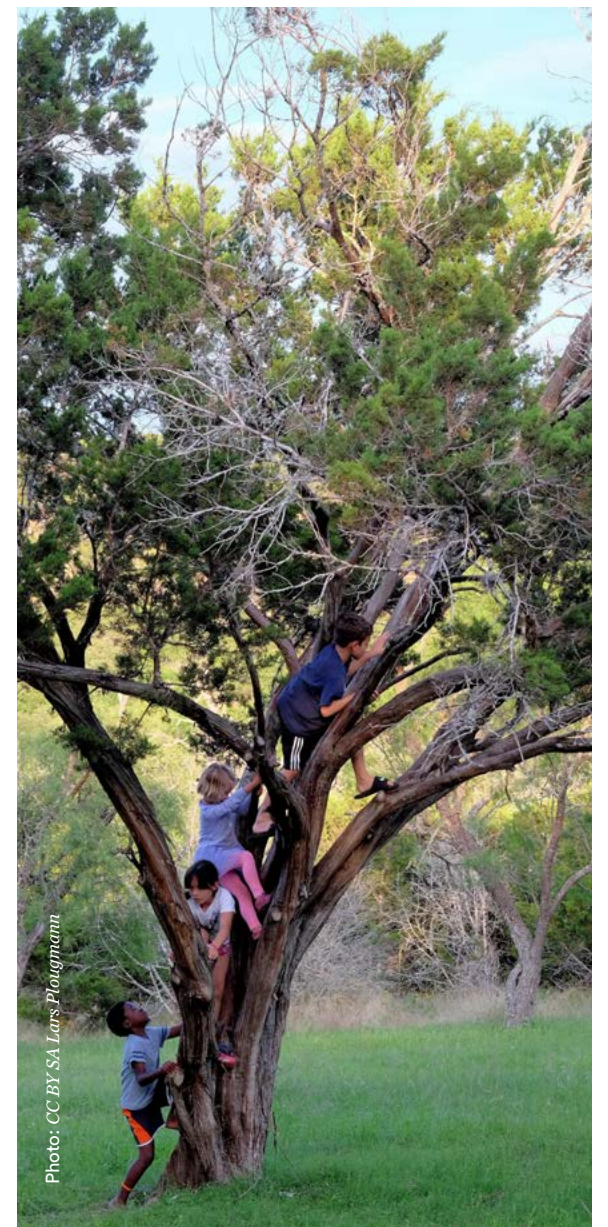


Photo: CC BY SA Lars Plougmann

Pam Warhurst

If you eat, you're in!

How growing free food in a small town is now changing relationships with nature across the globe.



Pam Warhurst

Co-founder, Incredible Edible

What wouldn't we do for our kids? We play in the park, cut down on sugar, walk them home from school, talk around that all-important dinner table - the stuff of everyday life that shows we care.

But when it comes to the impact on nature of decades of overconsumption - fossil fuels, flights all over the planet, throw away consumerism, whatever - for some reason we don't reckon that its effect on the futures of our children, let alone the children of people we may never meet, is of interest to anyone but 'environmentalists'.

Rio, Copenhagen, Kyoto, Paris? What had any of those international meetings to do with us?

Well, everything. And in the absence of real, brave leadership from those elected, millions of people are beginning to realize their own potential to build something kinder for the next generation - even when it seems too big a task for individual action.

It's not new. Ten miles from where I live is the birthplace of the Rochdale Pioneers, the founders of the cooperative movement that changed how we operate across the globe. They invented a different way of seeing things and working together because the times demanded change for the sake of their families and their communities.

Incredible Edible is just one of many similar movements worldwide demonstrating the power of small actions to bring about meaningful change. It was kicked off round a kitchen table in the small town of Todmorden, in England's West Yorkshire, almost ten years ago. That was closely followed by a public meeting in a local café. We had a simple, basic idea.

This was to use food, which everyone understands, to connect people with nature and help everyone take part in building a kinder future. It started with my co-founder, Mary Clare, planting vegetables in her front garden with a sign: "Help yourselves". That got people talking - and acting. Herbs and vegetables started sprouting on other sites in the town. The council decided to let anyone apply for a licence to grow food on its land; people got more free food, and the town had less waste ground to look after.

The model can be thought of as three spinning plates. One represents community action, such as growing food. The second stands for learning, not just formal, but in the lost arts of growing and cooking: to start with, every primary school was given a disused pleasure boat to use as a planter. The third is for business and the influence we can have simply by spending in support of local producers, instead of making the unthinking trip to the supermarket.

Start with any plate you like, we say, but always remember that they are a set. Get a few folks just to go out and do it. Demonstrate how things can be changed without permission, bids for philanthropic money or policy documents. Tell the story of what ordinary folks are doing and why. Have faith in the power of small actions: others also seeking a way of creating something better will find and join you.

Over time the impact of these simple actions has been amazing. Places that were unloved and abandoned now grow food



Photo: © Caroline Atwood

Local markets are being revitalized as we remind people that everything doesn't have to be flown halfway across the globe in a plastic bag.

to share. Roadside verges, railway platforms, hospital grounds and town centre squares have been redefined as edible landscapes.

The Incredible Edible model is now being embraced by dozens of communities all over the country, and the world. There are now more than 100 Incredible Edible groups in the UK. Internationally, they spread from Canada to New Zealand. Forward thinking local authorities - Wigan in the UK's North West is a good example - are examining how they can get out of the way and help their residents redefine health, wealth and happiness through their own actions.

Almost-lost knowledge of how to grow and eat well with little money is being rediscovered through conversations with older residents who've been through times of hardship. Exchanges over kitchen tables and raised beds increase respect across age and culture and bring friendships and collaborations that no policy action plan could ever imagine. Local markets are being revitalized as we remind people we get the economy in which we spend our money - and that everything doesn't have to be flown halfway across the globe in a plastic bag.

All this collectively can and does make a difference. It can put steel into the backbones of local politicians concerned about that all important front page of the local newspaper - or perhaps even more importantly, its letters page. It has a tremendous impact on a child growing up in a town, borough, or neighbourhood where food is available on the trees, in the park, around the health centre, everywhere. There's a reconnection with nature, the environment, seasonality, biodiversity, just through growing food locally.

Why stop there? Knowing that the spirit of collaboration is at the heart of all this - that we deliver stronger messages together - we have started another experiment. This time it's on a much bigger geographical scale aiming at challenging the status quo with all people using food across the North of England.

We aim to create a web of all the organizations and individuals in the region who are using the power of local food to redefine prosperity; to help them share and learn from each other; to collaborate not compete; to magnifying the impact simply by coming together.

This Incredible North, as we call it, is already happening, collaborating around food to reshape the North of England, and its mindset. Local authorities, hospitals and schools are using their procurement budgets on local production, redefining supply chains. Public bodies are rethinking the public realm in favour of local growing, helping citizens to reclaim the land. Prisons are growing food and teaching associated skills, pioneering a new approach to the rehabilitation of prisoners. Developers of social housing are rethinking the spaces around the homes and making it Edible.

Incredible Edible has always had one point of entry. If you eat, you're in. That's all of us. If we have the will, we can change the future. ▲

Tony Rinaudo

Keeping faith with nature

Faith can be a gateway to respecting nature, as successful land restoration has shown.



Tony Rinaudo

Principal Advisor, Natural Resource Management, World Vision Australia

Three childhood experiences set me on the course to working to restore degraded land through helping to connect people to nature. My mother's strong and unwavering faith helped me to appreciate that life was about more than what we could accumulate in the present, and that we could trust a loving heavenly father for all our needs. The abuse of beautiful forests and mountain streams seemed to be an expression of greed and disregard for future generations. Watching news programs showing children just like me going hungry seemed mad in a world of plenty.

I blurted out a child's prayer asking God to use me somehow, somewhere to make a difference. That set in motion a series of events which eventually took my wife, Liz and I on a journey to the Niger Republic and beyond.

In Niger, I inherited a tree planting project which was not having much impact. It was very hard to achieve good tree survival rates in that climate and farmers had other priorities. I soon realized that conventional reforestation methods would never deliver in a cost efficient way, or be scalable enough to reverse the overwhelming trend of desertification. After two and a half years of struggle and at the point of giving up, I asked God to forgive us for destroying the gift of His creation and to show us what to do. That day I saw with new eyes what had been there all along – an underground forest!

A 'bush' caught my attention while I was letting air out of the tires of my pickup. On closer inspection, it became clear that it was actually a tree that had been cut down and was now re-sprouting from the stump. Everything changed. I instinctively knew that this was the solution – and it had been at my feet the whole time! There were millions of similar 'bushes' strewn across that otherwise barren landscape. Each year they would grow to about one meter high and then, in preparation for sowing crops, farmers would slash and burn the stems, or take them home for fuel. As long as this continued the 'bushes' would never grow into full sized trees. So our team and the local community started preserving them, pruning back each bush to a single stalk, enabling it to become a tree again.

This developed into a re-greening movement, Farmer Managed Natural Regeneration (FMNR), involving the systematic regeneration and management of farmer-selected, naturally occurring trees and shrubs from stumps, roots and seeds. A natural agroforestry system – rather than a tree-planting one – it uses what is already in the ground, and is owned and driven by farmers and communities. Along with some spontaneous community movements, FMNR spread across southern Niger at a rate of 250,000 hectares per year, now impacting 5 million hectares of land. Average tree density rose from four trees per hectare in the 1970s to 45 today. It is estimated that, because of the resulting improved soil conditions and microclimate, Niger's farmers now produce an additional 500,000 tons of grain, while gross incomes have increased by \$900 million per year. And this has been achieved on the borderlands of the Sahara under very harsh environmental conditions where conventional methods failed.

Since joining World Vision Australia in 1999, I have seen FMNR spread to 24 countries. Upper East Province, Ghana, is not atypical. Its communities were living very



Photo: © Stephan Gladiou / World Bank

Through community-driven land restoration people are making their peace with nature – and often with themselves and others too.

Niger's farmers now produce an additional 500,000 tons of grain, while gross incomes have increased by \$900 million per year.

precariouly. Drought alternated with floods, temperatures rose and damaging winds increased in frequency. Women and children were walking four hours to collect fuel wood and many children were not in school. There was an acute shortage of fodder, and livestock were often stolen when they wandered far from home. People were regularly hungry and were on the verge of giving up hope of their land ever being able to support them. The chief of Yamarega village said: "If things get any worse, we will have to leave our ancestral land and move to the capital city".

In 2011, just two years after an FMNR program had started, crop yields rose, fodder and fuelwood became available close to villages, as did wild foods from regenerating indigenous trees, supplementing diets and incomes. Flooding and drought decreased as the trees grew and the incidence of damaging winds fell. The chief called it a "gift from the Almighty God".

After over 30 years of promotion, nobody has ever come to me and complained that FMNR has ruined their farm. The responses are overwhelmingly positive: improved ecosystem function results in increased food, water, fodder and income security, diversified income sources, and increased resilience, not to mention increased biodiversity and environmental benefits. As incomes and opportunities increase, communities report improved

health, greater school attendance, reduced conflict and emigration, and a greater sense of wellbeing.

Individuals and communities, including former enemies and people of different ethnic and religious backgrounds, can be brought together. In Rwanda, former genocide victims and perpetrators now work together to care for each other's trees and in Ghana, herders and cultivators, who are often in conflict, are working together to restore the environment because they realize that it is in everyone's best interest. Such cooperation seems to bring heightened awareness of humanity's common bond, of mutual dependence on the environment, and of the need for good stewardship.

In my own life I have found that faith in God has been inseparable from love and respect for nature. Faith can be a gateway to respecting nature just as respecting nature can deepen one's faith. Nature is very forgiving and responds positively and quickly when we repent of destructive ways and begin to work with – instead of warring against – her. It seems to be that the link between faith, people and nature is particularly strong in many developing countries, where most people are acutely aware of their dependence on both God and the environment. Through community-driven land restoration people are making their peace with nature – and often with themselves and others too.▲



A serious game for serious issues

UN Environment has embraced the world of gamification to raise awareness about the importance of managing water and ecosystems in a sustainable way.



Photo: CC BY-NC NASA Johnson

The Aqua Republica game combines game mechanics and hydrological simulations to help people better appreciate the inter-linkages between water resources, social and economic development, and environmental sustainability.

Since 2013, UN Environment, together with DHI (a name not an abbreviation), has been developing this innovative online game.

“This game is an exciting way to sensitize people and convey knowledge. As we speak, more than 15,000 high school children, university students, government officials and senior experts have either played the game or used it in competitions, training sessions and meetings,” says Gareth James Lloyd, Senior Advisor at UN Environment-DHI Centre. An annual international schools’ competition has seen more than 2,000 children playing each year.

The game presents a number of real-life challenges such as how to allocate resources between municipal, agricultural, industrial and energy sectors, while ensuring adequate environmental services and minimizing adverse climate change impacts.

The game platform caters for people across all age groups and with different levels of “ecosystem” understanding. It also allows deeper dives into topics such as the Sustainable Development Goals, through a guided learning experience.

The game typically starts by introducing players to Aqua Republica,

“Aqua Republica is a great way of getting people to understand the complexities of environmental planning and the web of interlinkages and trade-offs involved.”

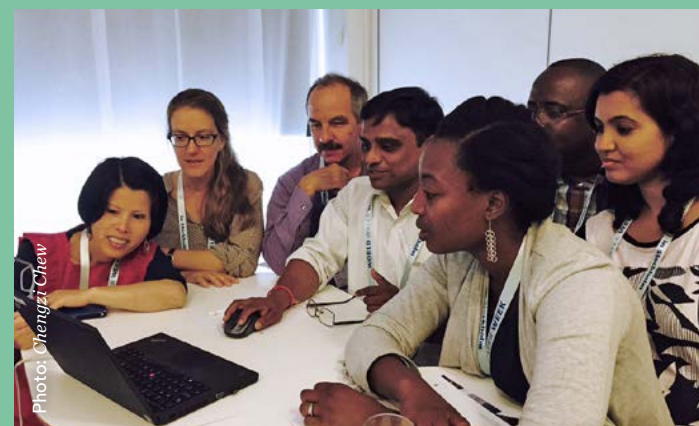


Photo: Chengzi Chew

before informing them that they have the responsibility to develop a small but ambitious nation in the most sustainable way possible. As the game progresses, factors such as climate change, population growth and demand for homes and jobs, force players to adapt to survive and thrive.

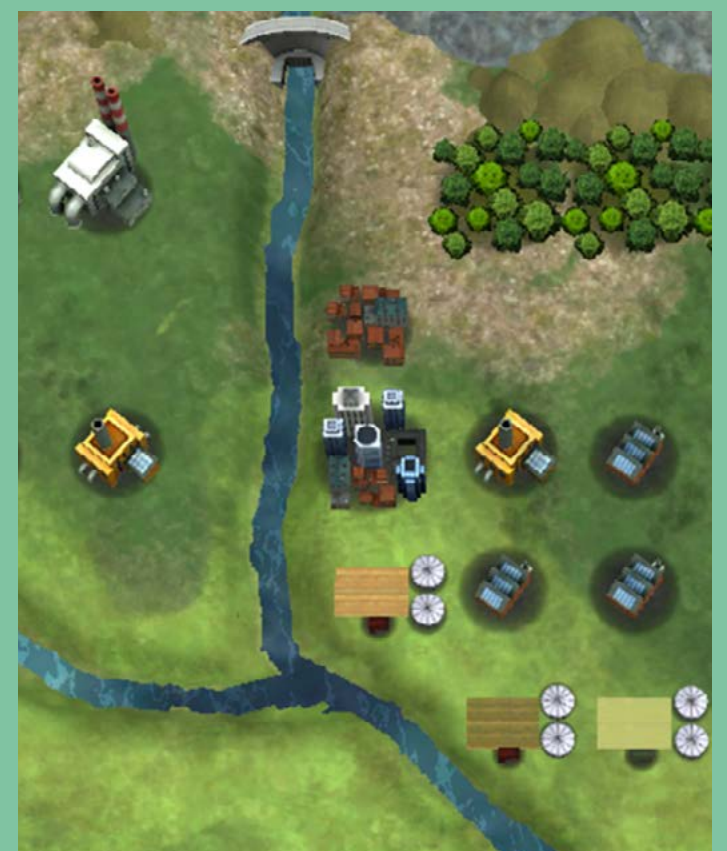
The game presents scenarios such as growing crops for food or bio-fuel, asking the player to find how to best achieve both goals while mitigating environmental and climate change risks. Players learn quickly that infrastructure development is costly, takes time to implement, and often hurts the resource base on which they depend.

One reason for the game’s success is that it is fun and interesting. It provides a realistic learning environment, one that allows players to make mistakes and learn from them, so that they could avoid them in a real-life situation. There are plans to expand the game platform to mobile devices.

“Aqua Republica is a great way of getting people to understand the complexities of environmental planning and the web of interlinkages and trade-offs involved,” says Lloyd.

While the world of Aqua Republica is fictitious, the water management challenges are real. The game is a way to learn about integrated water resource management whilst having fun along the way.▲

Explore the game at aquarepublica.com



Arvind Kumar

The rights of rivers

Despite drawbacks, a pioneering court judgment provides an opportunity to clean up vital rivers



Arvind Kumar
President, Chair and
Founder, India Water
Foundation

History was made recently when a court recognized the rivers Ganges and Yamuna as a living entity. This affords opportunities to tackle problems related to water and climate change sustainably amid the rapid melting of Himalayan glaciers, the depletion of groundwater resources, pollution of ground and surface water resources, erratic rainfall patterns that wreak havoc with human lives and property, and calamities like flash floods, landslides, avalanches and famines.

The high court of Uttarakhand, a Himalayan state in northern India, ruled on 20 March 2017 that “the Rivers Ganga and Yamuna, all their tributaries, streams, every natural water flowing with flow continuously or intermittently of these rivers, are declared as juristic/legal persons/living entities having the status of a legal person with all corresponding rights, duties and liabilities of a living person in order to preserve and conserve river Ganga and Yamuna.”

Both rivers are highly polluted. An estimated more than 1 billion gallons of waste flows into the Ganges alone every day from sewer drains, leather tanneries, squat toilets, and elsewhere. The Yamuna, its main tributary, is also tainted with sewage and industrial pollution and has stagnated in some places. Some experts say most of the sewage treatment plants near the rivers are not functioning as they were designed to.

Skeptics point out that the high court’s decision cannot stop the discharge of waste to the Ganges and Yamuna immediately. Even the Indian Prime Minister Narendra Modi’s ambitious Namami Gange (Obeisance to the Ganges) cleanup campaign has met with mixed success. Claims that industrial pollution has already fallen by a third since its launch are contradicted by reports from media on the ground. Some experts have attributed the failure of official campaigns to neglect of the management of river basins, lack of governance of water resources and non-participation by local communities.

Restoring Europe’s Rhine, which is half the length of the Ganges, took almost three decades and reportedly cost \$45 billion. Yet the budget for Namami Gange is about \$3 billion over five years and money allocated since 2014 has been only partially spent.

Environmental activists point out that merely announcing that the Ganges and Yamuna, are a living entity will not save them and say that officials, polluters and citizens need

There is a need to change cultural attitudes which have long held the Ganges to have self-purifying properties.



Photo: CC BY SA M M

An estimated
1 billion gallons
of waste flows into the
Ganges every day.

to act in unison to clean up the rivers and stop further pollution. Our foundation’s ground-level experience garnered as a public awareness and participation partner in the Clean Ganga Action Plan at Varanasi has revealed a dire need for capacity building among all stakeholders in order to keep the river free from pollution. There is a need for specific emphasis on changing cultural attitudes, which have long held the Ganges to have self-purifying properties.

Many environmental activists and legal experts also point out that both central government and the states through which the rivers flow have enacted laws to deal with

pollution, and question how granting them the status of a juridical person is going to solve the problem. This also raises the question as to whether both the rivers have been suffering for want of legal protection or lack of ability to initiate action against polluters. They also emphasize the need to examine whether the high court, by appointing guardians to sue polluters on behalf of the rivers, has unwittingly enabled victims of pollution and other damage to sue for compensation.

Furthermore, some legal experts say the high court judgment was myopic in granting guardianship of the rivers only to Uttarakhand, along with central government, while ignoring the interests of other states through which they flow. The Ganges flows for 2,525 km through Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal, with just 96 km in Uttarakhand, while just a small part of the 1,376 km Yamuna – which also runs through, Haryana, Himachal Pradesh, Delhi and Uttar Pradesh – is in the state.

Despite all this skepticism about its impact, the high court’s decision does reflect a sense of urgency in endeavoring to rescue two very important rivers from rampant pollution. It provides an opportunity to lay down the foundations for progressive and democratic legislation which recognizes that the rivers are commons and need to be seen as an integrated whole rather than owned and managed in pieces by different agencies – and that there must be democratic representation and participation by the communities whose lives are linked with them.

Thus there is an opportunity to be seized by all stakeholders in pushing for a deeper, wider dialogue, and for appropriate legislation to transform the challenge of pollution into an opportunity to restore the pristine glory of these, and other, rivers. ▲



Photo: CC BY NC ND Spyros Petropoulos

Jan LaPierre

Connecting in nature

Experiencing nature can heal trauma and bring people together.



Jan LaPierre
Co-founder, A for Adventure

Canada has 46 national parks and reserves, 171 national historic sites and four national marine conservation areas, adding up to 300,000 square kilometres of protected areas. They represent the country's massive, yet varied, landscapes from the towering mountains of Waterton Lakes National Park in Alberta, to the sparkling sands of Sable Island National Park Reserve off Nova Scotia, to the lush rain forest of Gwaii Haanas National Park Reserve on the coast of British Columbia. All these places tell Canada's ecological and cultural story. As its population becomes increasingly urban – and with the average park over two hours from a city – the need is to make more visiting opportunities available.

Parks Canada aims to reach newcomers to the country, give them the opportunity to learn basic camping skills and build confidence to enjoy the outdoors. These include refugees fleeing their home, thus posing a dilemma. Images of crowded camps of displaced people dominate the narrative of the Syrian refugee crisis. Why trigger potential traumas? After so much turmoil and hardship, years spent in uncertainty, does another night in a tent sound appealing?

Parks Canada's Learn-to Camp programme began in 2011, and was an instant success. The idea is simple: Go camping! Start with offering the basics: what equipment to bring, how to set up a tent and cook on a fire. Using community partnerships in organising overnight events helped bring together committed camping enthusiasts and eager participants.

Since its inception, the program has helped 10,000 people discover the joys of camping in national parks and national historic sites. It has been well-attended by new Canadians from the start.

Building on the programme's success, the Immigrant Settlement Association of Nova Scotia decided that it could provide an excellent chance for recently arrived Syrian refugees to experience much needed time in nature and to have a chance to bond with other families from their country. Throughout the Syrian refugee crisis, Canada has been a vocal leader in advocating for the rights of refugees and it has rolled out an ambitious resettlement program for over 25,000 immigrants. The association identified five Syrian families in Halifax, Nova Scotia (63 people in total) to take part in an overnight program in July 2016 in the province's Kejimikujik National Park. Many of them had been in Canada for less than five months so translators were brought in to help with the language barrier. However, as is often the case, the language of nature proved universal.

As one of the founders of a small company, A for Adventure, and a professional outdoor enthusiast who has worked in the field of mental health and addictions for many years, I have seen first-hand the power of nature in helping to process trauma and aid healing. I wanted to inspire the younger generation to connect with the natural world, and grow up with a sense of wonder. The idea for a children's book was born: "A is for Adventure" a rhyming A to Z book that aims to ignite the imagination with themes of curiosity, creativity and resilience. The importance of storytelling is one of the most motivating, yet often overlooked, reasons why people seek nature.

Storytelling – whether through radio, television, events, publications, videos, photos and social media – has always been the principal way through which we foster dialogue around



Photo: © A for Adventure

Translators were brought in to help the Syrian refugees who had come camping with the language barrier. However, the language of nature proved universal.

the importance of protecting and connecting to this beautiful planet. As the conversation grew to involve more people, A for Adventure grew into a movement, a rallying cry, and we were asked to work with an ever-growing list of companies and organizations. After meeting Parks Canada, we realized that we shared common goals of connecting people to nature.

Parks Canada invited us to join select Learn-to Camp events throughout 2016, including the one hosting Syrian families at Kejimikujik. It was a hot July day when we all met in the group campsite. Thick, clumsy clouds threatened rain all morning, but no one seemed to notice. Bright yellow tents soon popped up in all directions, buzzing with excitement like a village of bumble bees. The day was broken into different workshops around the fundamentals of camping and outdoor pursuits, with – as in all Learn-to Camp programs – plenty of time for taking things slow, allowing for lots of questions and a high dose of fun. Structured activity is balanced around ample amounts of free time and exploration.

We found ourselves being led down a short wooded path by two young kids. "What's this called? What kind of tree is that? LOOK AT THIS BUG!" We dug our hands into the cool mud below an oak tree and cleared away some dead leaves to

discover a salamander. As wonder filled their eyes, I explained how something as small as the salamander, had a very important job helping to recycle plants in forest.

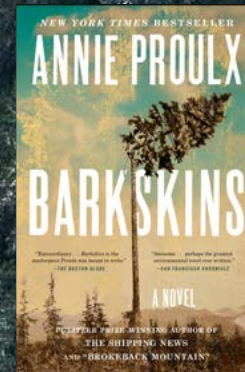
Later that night around the campfire the group heard traditional songs by a local indigenous interpreter. The sound of her drum echoed across a still lake. The stars were out in full effect. The moon hung low. A father stroked the head of a tired child. "This... this is how to live" he said slowly.

We all understood. In that moment we were all connected. Learn-to Camp isn't just about acquiring new skills, it's about learning from each other. We all left with the unspoken knowledge that we had learned far more than we had taught, and wanting to return next year.

Connecting to nature offers a sense of communal destiny, a belonging between humans and the rest of the natural world. When we immerse ourselves in nature we are confronted with the delicate balance that is life. Nature can awaken the mind and the spirit. It offers rewards of enhanced creativity, enriched curiosity, but most importantly it gives the gift of resilience. We don't look to nature to escape our lives, we return to it because it's our home. ▲

Environmental Champion Annie Proulx

Annie Proulx's novels explore humanity's relationship with nature; her latest focuses on deforestation.



I came to believe that climate change was perhaps the greatest event to ever face the human species, and the evidence that our species had also created this crisis was mind-rattling enlightenment.



Photo: © Gus Powell

Some 30 years ago, the celebrated author Annie Proulx was driving through the backroads of Michigan's Upper Peninsula when she came to a highway junction, marked only by an apparently closed laundromat. "Across the road" she told Our Planet "was a large sign, announcing that in that place in the nineteenth century had grown the finest white pine forest in the world. There was not a single white pine in sight".

She believes that this was the "likely starting point" for her latest novel, *Barkskins*, which illuminates how human greed has destroyed the world's forests. It "developed over years of observing small changes", she says, but "this was the experience that started me thinking about forests and how easily they could disappear, even without a sign to tell they once existed."

Proulx's novels often focus on humanity's relationship with nature. Her Pulitzer Prize-winning *The Shipping News* features people hit by the collapse of Newfoundland's fisheries; *Brokeback Mountain*, which won a National Magazine Award, is set in the wide spaces of Wyoming. She was brought up in New England "in a family that took forests, clean air and rivers as a given and regarded nature as a constant source of interest. The natural world was the real world for me and my extended family. We went into the forests and swamps for fiddleheads, blueberries, wild strawberries, butternuts and beech nuts. We tapped maple trees for sap to make syrup.

"More than just an appreciation for trees and growing things, this childhood gave me a sense of the stunning complexity of the still-extant New England ecosystem." Then, she adds, "somehow I managed to live most of my life in rural places where the hand of nature still held the cards.

"So for me it was the slow realization that this world was disappearing in my lifetime that directed my attention to the evidences of climate change, particularly in the forests which sequester CO2 and keep the world's atmosphere clean and refreshed. I came to believe that climate change was perhaps the greatest event to ever face the human species, and the evidence that our species had also created this crisis was mind-rattling enlightenment."

Some ten years ago, she says, "I knew I wanted to write a novel about climate change. But I found the subject so massive and diverse, so tangled with unknown links and inter-species dependencies that it would take many lifetimes to understand. I decided to write about one facet of climate change — deforestation and the human role in it.

"If our species hopes to continue living on the earth as in the past, maintaining and fostering forest ecologies is literally vital. We are inside the gates of 'The End of the World As We Know It'."

While we know the importance of the Amazon forests, "the northern circumpolar boreal woodlands have perhaps an even larger role in maintaining all life. The boreal forests of several nations sequester

billions of tons of carbon dioxide. They powerfully affect the temperatures of the oceans' conveyor belts and hence convection and weather. They cleanse the atmosphere of pollutants and infuse it with medicinal aerosols. And they are being destroyed."

Despite the "inevitable, deliberately ignorant despoilers who seize everything they can for their own benefit without thought of sustainability" she does not despair. "There are signs in recent decades that we are beginning to grasp how very important it is not to exhaust resources of forest, ocean, river, earth and air and how difficult it will be to achieve a sustainable future." But "there is a terrific lag between what we know and what we do."

She notes how indigenous people managed to live in harmony with the natural world for millennia. "If it is not too late, if the knowledge has not been lost, certainly it will be a great day if the dominant faction ever recognizes they can learn from native people how to live in a sustainable way.

"Do I think this will happen? I am not without hope because there are many thousands of ordinary people who are getting the idea that the peril of our ways is real. Nearly every country has numerous citizen science projects, setting out seedlings, growing endangered plants, counting birds, gathering samples of seaweed, measuring tree girths, gathering plastic from ocean beaches and waterways, observing insect behaviour. In the citizen science project movement I do have some hope." ▲



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