



SPECIAL ISSUE
celebrating 40 years
of UNEP

Our Planet

CAMILLA TOULMIN 40 YEARS OF UNEP A.H. ZAKRI PERSPECTIVES ON Rio+20
ADNAN AMIN POWERING THE GREEN ECONOMY ELIZABETH THOMPSON REVOLUTION AT RIO



“We believe that we, as a country, can be a **pioneer** for a **new age** of **renewable energy** sources.”
ANGELA MERKEL
CHANCELLOR, GERMANY



“The **UNEP Green Economy report** challenges the myth that there is a trade-off between the **economy** and the **environment**.”
BAN KI-MOON
SECRETARY GENERAL,
UNITED NATIONS



“Our green economic mantra is **pro-growth, pro-job, pro-poor, pro-environment** — and of course **pro-business**.”
SUSILO BAMBANG YUHOYONO
PRESIDENT, INDONESIA

RIO+20



“If we want to solve **financial** and **environmental** crises, we need to find a **solution** for both — and that solution involves **green growth** — **sustainable growth**.”
FELIPE CALDERÓN
PRESIDENT, MEXICO



“And the new **Green Economy** dialogue that we’re creating today will **deepen** our **cooperation** even further, in **green buildings** and **sustainable development**.”
BARACK OBAMA
PRESIDENT, UNITED STATES



“Our goal is clear, that is to **build** an **economy** that **protects** the **environment** as well as an environment that supports the **growth** of the **economy**.”
SHEIKH MOHAMMED BIN RASHID AL MAKTOUM
PRIME MINISTER AND VICE-PRESIDENT,
UNITED ARAB EMIRATES



“The **Green Bridge initiative** ...will strengthen the **partnership** between Europe and Asia in the promotion of **green economic policies**.”
NURSULTAN NAZARBAYEV
PRESIDENT, KAZAKHSTAN



“We are here **today**...to make the first **positive steps** toward **greening** our **economy**.”
KAMLA PERSAD-BISSESSAR
PRIME MINISTER,
TRINIDAD AND TOBAGO

“China will honor its **commitment** to growing a **Green Economy**.”
HU JINTAO
PRESIDENT, CHINA



“The **future** of the world is in **green** and when we **plan** our future we must do so on the basis of **green technologies**.”
MELES ZENAWI
PRIME MINISTER, ETHIOPIA

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* All dollar (\$) amounts refer to US dollars.



2012 INTERNATIONAL YEAR OF
**SUSTAINABLE ENERGY
FOR ALL**

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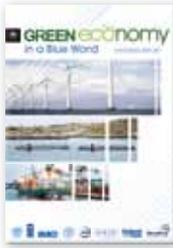
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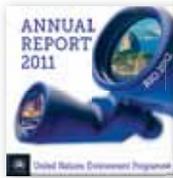
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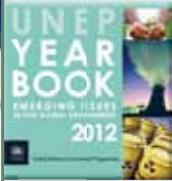
Green Economy in a Blue World

Prepared by the United Nations Environment Programme (UNEP) and a wide-ranging group of partners, the publication takes a sector-by-sector approach to examine the potential of each to deliver economic growth. With as much as 40 per cent of the global population living within 100 kilometres of the coast, the world's oceans and coasts – the Blue World – provide essential food, shelter and livelihoods to millions of people. But as more and more people move to coastal regions, human impacts are taking a toll on both the ecological health and the economic productivity of the world's oceans.



UNEP Annual Report 2011

The Annual Report 2011 shows the full range of UNEP's work for the environment and development and brings the work of UNEP in 2011 full circle and back to the Green Economy with its potential to deal with multiple challenges and assist the international community realize and implement sustainable development.



UNEP Year Book 2012

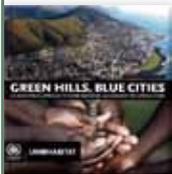
From the depletion of soil carbon to decommissioning nuclear reactors, the UNEP Year Book 2012 puts key emerging issues on the global radar. In particular it points out that the dramatic improvements in the way the world manages its precious soils will be key to food, water and climate security in the 21st Century and it highlights another issue of emerging global concern — the challenges of decommissioning the growing numbers of end-of-life nuclear power reactors.



Technology Transfer Perspectives Series: Technologies for Adaptation Perspectives and Practical Experiences

UNEP Risø Centre on Energy, Climate and Sustainable Development

This edition of the Technology Transfer Perspectives Series collects ten articles from adaptation experts and practitioners around the globe. The articles discuss the concept of 'technologies for adaptation' which are divided into three broad themes: Concept and Context of Technologies for Adaptation, Assessments of Adaptation Technology Needs, and Practical Experiences from Working with Technologies for Adaptation.



Green Hills, Blue Cities:

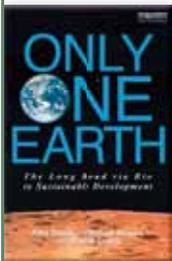
An Ecosystems Approach to Water Resources Management for African Cities

Africa is currently the least urbanised region in the world, but this is changing fast. Of the billion people living on the African continent, about 40 per cent lives in urban areas. The urban population in Africa doubled from 205 million in 1990 to 400 million in 2010, and by 2050, it is expected that this would have tripled to 1.23 billion. Of this urban population, 60 per cent is living in slum conditions. In a time of such urban growth, Africa is likely to experience some of the most severe impacts of climate change, particularly when it comes to water and food security. This places huge pressures on growing urban populations.



Women at the frontline of climate change - Gender risks and hopes

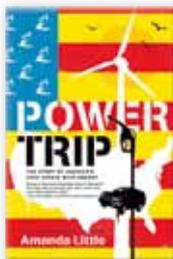
Women are often in the frontline in respect to the impacts of a changing climate. Globally the world is seeing increasingly frequent droughts and floods which are having economic but also profound social consequences. The women and people of Asia are currently at greatest risk with over 100 million people affected in this region annually.



Only One Earth: The Long Road via Rio to Sustainable Development

By Felix Dodds and Michael Strauss with Maurice Strong

Only One Earth provides a roadmap of how we have arrived at present-day environmental concerns and where we must go next. It presents a policy agenda for the survival of humankind on a planet with finite resources addressing issues such as the implementation gap, the democracy gap, the governance gap and what should be done to move to an economy that supports sustainable development ending with 21 issues for a survival agenda.



Power Trip By Amanda Little

After covering the environment and energy beat for more than a decade, Amanda Little decided that the only way to really understand America's energy crisis was to travel into the heart of it. She embarks on a daring cross-country power trip, and describes in vivid, fast-paced prose the most extreme and exciting frontiers of our energy landscape. Hard-hitting yet forward-thinking, Power Trip is a lively and impassioned travel guide for all readers trying to navigate our shifting landscape and a clear-eyed manifesto for the younger generations who are inheriting the earth.



Achim Steiner
UN Under-Secretary-General and
Executive Director, UNEP

Fourty years ago in the Swedish capital city of Stockholm history was made at a UN conference on the future of humanity and the planet. Amid rising concern over pollution, the growing loss of species and the dying of forests as a result of acid rain, governments agreed that a UN body charged with coordinating a global response to such challenges should be established.

It was the birth of UNEP and between June 1972 and the UN General Assembly that year, countries lobbied to host this new environmental body. In the end Kenya won the diplomatic debate and in doing so became the first developing country to host a UN headquarters.

Black and white photographs taken on 2 October 1973 at the inaugural celebrations show President Kenyatta, flanked by forest rangers and game wardens, waving his signature fly whisk while 43 year-old Canadian Maurice Strong, UNEP's first Executive Director, stands to attention.

It was originally set up to coordinate the rest of the UN system's activities on environmental issues and to provide the science to member states on emerging trends in environmental change.

The emphasis on science has perhaps been among UNEP's most important contributions that in turn has led to governments negotiating key global treaties to address emerging environmental crises.

The Montreal Protocol on Substances that Deplete the Ozone layer – the protective shield that filters out dangerous levels of the sun's ultraviolet rays – is a case in point. Without the Montreal Protocol, atmospheric levels of ozone-depleting substances could have increased tenfold by 2050 which in turn could have led to up to 20 million more cases of skin cancer and 130 million more cases of eye cataracts, not to speak of damage to human immune systems, wildlife and agriculture.

Bringing forward the science and convening treaty negotiations continues to this day.

In the late 1980s, as the world was struggling to understand the implications of rising greenhouse gases in the atmosphere, UNEP and the World Meteorological Organization established the Intergovernmental Panel on Climate Change (IPCC).

Its scientific work has become the premier risk assessment and reference work for governments on the likely trends and impacts of global warming and the IPCC's findings played a key role in the decision to establish the UN climate convention and its emission reduction treaty, the Kyoto Protocol.

At the World Summit on Sustainable Development in Johannesburg in 2002, UNEP was asked to spearhead a partnership in order to accelerate a global phase-out of leaded petrol. Lead is especially damaging to the brain of infants and the young.

Since then around 80 developing countries including Ghana, Kenya, Tanzania, South Africa and Vanuatu have removed lead from transport fuels and only now are the enormous benefits emerging.

Scientists calculate that improvements in IQ, reductions in cardiovascular diseases, and decline in criminality are among the annual \$2.4 trillion benefits linked to ridding the world of leaded petrol.

It is yet another example of how environmental measures and action also links directly to the social factors and issues of poverty, equity and livelihoods.

Since 2008, UNEP has also been championing the Green Economy as a way of generating development and employment but in a way that keeps humanity's footprint within ecological boundaries.

Part of the Green Economy work has been to assess and communicate to governments the multi-trillion dollar services that nature provides, but which until recently have been all but invisible in national accounts of profit and loss.

So what of the future? As Environment Ministers gather in Nairobi for their annual meeting of the UNEP Governing Council in February 2012, all eyes are on the follow-up to the Earth Summit of 1992, or Rio+20.

This meeting, taking place in June, may prove to be an opportunity where the Green Economy initiative is translated into a fresh and forward-looking way of finally realizing sustainable development for seven billion people, rising to over nine billion by 2050.

And in their submissions to the Summit, many governments are also signaling that the time has come to evolve UNEP itself onto a higher level, perhaps into a World Environment Organization.

Whatever the final outcome of Rio+20 – it is a great compliment to an institution when after 40 years member states express the wish to strengthen it and to do so in its African home.



ELIZABETH THOMPSON
Executive Coordinator
Rio+20 Conference

Revolution at Rio

“We can’t solve problems”, said Albert Einstein, “by using the same kind of thinking we used when we created them.” His warning is very relevant as world leaders consider how to construct multilateral approaches and solutions to surmount the social, environmental and economic challenges facing humanity. As Rio+20 approaches, they have a rare opportunity to adopt the revolutionary thinking needed to craft solutions for change and chart a new path of sustainable development for countries, citizens, communities, companies – and Planet Earth.

Rio+20’s “Zero Draft” – which will form the basis of the negotiating text – was released on January 10th after a transparent process which published all submissions online. Writing it was an enormous task, involving distilling and capturing the essence of those documents, faithfully following the submissions of member-states, injecting the text with all the important elements, finding language which did not conflict with previous multilateral

agreements or offend any geopolitical grouping, and deciding what length of document best achieved all these objectives without exceeding practical functionality.

Member-states must now lift this draft to a higher level by transforming it into an ambitious platform for sustainable development, catalysing a global Green Economy. As the Secretary General of the United Nations says: “to make sustainable development happen we have to be prepared to make major changes – in our lifestyles, our economic models, our social organization, and our political life... We need ... Revolutionary thinking. Revolutionary action.”

The Rio+20 Outcome must simultaneously serve multiple interests. It must respect the North’s industrialisation and desire for continued growth and satisfy the South’s development needs and nuances. It needs to assure large emerging economies that their development trajectories will not be halted or present gains reversed.

It should present LDCs, SIDS and Africa with new opportunities to bolster development prospects. And it will be expected to increase the resilience of middle income countries to cope with disasters and crises.

Rio should promote positive South-South and triangular collaborations and establish effective partnerships between governments and private sectors. It should identify the financial resources that the more vulnerable developing countries will need to effect the transition and create a more stable and sustainable global economic system. It must find a list of Sustainable Development Goals (SDGs) around which all can coalesce. Even, more important, it must challenge politicians to consider development beyond the narrow political cycle. Put succinctly, the Rio Outcome, together with the Report of the Secretary General’s Global Sustainability Panel (High Level Panel), must craft “the future we want” for the people and planet. This may be a tall order, but – as Nelson Mandela has told us – “it always seems impossible until it’s done.”

Despite Agenda 21, a universally accepted definition of sustainable development, and keenly pursued Millennium Development Goals, poverty has not been eradicated. There must therefore be a renewed global effort to end poverty and achieve social equity and justice. Member-states are expressing a strong desire to enhance the institutional framework's effectiveness in implementing sustainable development; this involves addressing several questions:

- Given their importance and impact on growth, why have sustainable development issues remained the province of environmental ministries rather than being embraced by heads of government and ministries of finance/economic affairs?
- How can the multilateral system and international development institutions function more efficiently, effectively and collaboratively to deliver global sustainable development?
- How can any defects in the existing architecture for sustainable development be prevented from being replicated in the new structures?
- To what extent will appropriate national structures need to evolve to complement, and deliver, on the multilateral sustainable development agenda?
- What policies, strategies and mechanisms are essential to mainstreaming sustainable development?
- How can understanding that environmental and economic issues are synonymous be reinforced at the highest levels of government and business?
- How do we best demonstrate to business that sustainability equals profitability?

Recent social uprisings, from the Arab Spring to Occupy Wall Street, have represented citizens' calls for greater equity, sustained well being, greater

“There may be differences over the definition of the Green Economy, its potential for universal application and its capacity for transformation – but it must be conceded that the status quo has not produced the needed development solutions.

New approaches must be tried to allow us to prosper while living within planetary boundaries.”

involvement in their governance and a fair share in the benefits of globalisation. The near complete inability of both North and South to escape the contagious food, fuel and finance crises has served to emphasize the interconnection of economy, environment and society – or, as some express it, “people, planet, profit/prosperity”. There may be differences over the definition of the Green Economy, its potential for universal application and its capacity for transformation – but it must be conceded that the status quo has not produced the needed development solutions. New approaches must be tried to allow us to prosper while living within planetary boundaries.

Governments have a critical leadership role in mainstreaming and practising sustainability. However, the transition to a global Green Economy will not be possible without the constructive engagement of non-state actors and the involvement and cooperation of the private sector; especially if, as Naomi Klein contends, “of the top 100 economies, 51 are companies and only 49 are countries.” Moving the private sector toward taking greater corporate social responsibility, practising sustainability and making green investments will be critical in creating decent work, generating

wealth and eradicating poverty while protecting our natural resource base.

In a resource-constrained international economy, investment in and management of natural capital will be pivotal in enhancing shareholder value and raising brand or company profile. As Andre DuBrin puts it, “a company that pursues the ideals of a Green Economy will therefore gain some competitive advantage in the global market.” Governments should create the enabling policy, legal, fiscal, and regulatory frameworks for private sector involvement: moving toward financial transparency – and the possibility of a convention for business sustainability – are significant inclusions in the Zero Draft.

Thinking and action after Rio+20 must blur the line between so-called “soft” issues like the environment and “hard” ones such as the economy, between social equity on one hand and GDP and interest rates on the other; the emergence of new metrics which go beyond GDP to encompass quality of life and social indices as part of the new sustainability paradigm holds promise. The Rio Conference will be a success if it is perceived and treated as a special general meeting of all the shareholders of Earth Incorporated, aimed at demonstrating the costs, benefits and value of simultaneously building natural, human and social capital; fostering social cohesion and economic sustainability.

When the gavel goes down at Rio we should be walking away with an immense sense of satisfaction, carrying in our hearts a commitment to sustainable development, carrying in our minds the intent to make it happen and carrying in our hands a tangible set of policies and initiatives that will make the transformative difference across the globe. In Conference Secretary General Sha Zukang's words: “history has given us an opportunity to make a difference. Let us all seize that.”



A.H. ZAKRI
Science Advisor to
the Prime Minister of Malaysia

Perspectives on Rio+20



In June leaders from around the world will gather in Rio de Janeiro to mark the 20 year anniversary of the 1992 Earth Summit, a summit that was largely responsible for setting up the global governance architecture for environment. High among the priority issues is recognising the grim reality that the current governance arrangements for environment have failed to meet expectations; indeed, have not reversed or even contained the decline of the environment over the last decades. Hence, today leaders must face facts that taking the modest and incremental approach they took in Rio 20 years ago is not enough and that only a major overhaul of the governance system will heed the reforms needed to address the challenges of environmental sustainability.

The most sensitive issue that will be discussed is the creation of a World Environment Organization (WEO) to anchor the global efforts for the environment. Almost instinctively, the words “world” and “organization”, when heard together by developing country diplomats, makes them react, “We are against it, it would be another World Trade Organization (WTO) and that’s the last thing we need.” It’s a deeply embedded and suspicious view expressed time and time again in New York’s diplomatic circles.

The reality is that there is a serious need for a WEO and that proposals for it look nothing like a WTO. Most United Nations specialized agencies actually are not like the WTO at all. Most, such as the WHO, FAO or UNESCO, are organizations that

provide consultative and facilitative functions and assist countries to meet the global commitments derived from mutual agreements. They are not at all regulatory, like the WTO, which sets standards and reduces barriers to trade.

A WEO is the kind of organization we need now badly; more than ever. Right now environmental issues are governed internationally by a hodgepodge of institutions spread across the UN. In fact, there are more than 40 different UN agencies with environmental programmes. Over the years the international community also has adopted hundreds of multilateral environmental agreements, all with their own secretariats and administrations. Last year there were more meetings than there were calendar days in the year. The last five years of meetings from only a fraction of these agreements have produced over 5,000 decisions that countries are supposed to act upon through national efforts.

The system has become insanely complicated and virtually impossible for developing countries to participate in meaningfully. The only countries that cope with the system are the richest countries of the world, while the poor developing nations are becoming disenfranchised.

There must be change. Developing countries need to think clearly about their needs for the environment and get over this stigma that the "environmental agenda" is only for the rich. Environmental issues are paramount for the poorest nations. The environment goes to the heart of development and livelihoods and the well-being of all of us. Moreover, there is a growing economy based on market niches in green technology, and green goods and services. A market opportunity that Malaysia and many other Asian countries are quickly realizing.

"The most sensitive issue that will be discussed is the creation of a World Environment Organization (WEO) to anchor the global efforts for the environment."

History has shown that most of the global organizations that we have today were actually designed and negotiated by the developed world while developing countries have stood on the sidelines and watched it all take place. We have been too busy pushing for more financing and development, which of course are needed, but we haven't realized that the operators of the system are the global institutions and they are skewed in favor of the North.

We have to change this approach when it comes to redesigning a new environmental governance system; it must have a development focus and be better aimed at responding to developing countries' needs. This means a WEO must have certain and distinctive priorities. It must be a democratic body with universal membership where each country has one vote, not weighed voting as in the case of the many financial assistance agencies where donor countries have more votes compared to recipient countries.

Developing countries need implementation support, especially technical assistance, capacity building and technology support. A WEO therefore must have an implementation arm to respond to developing countries' needs. Right now implementation support falls through the cracks in the UN system as no one agency is responsible for this within the environmental sector, meaning that in the end it is developing countries which are

losing out. This is especially the case for multilateral environmental agreements where there are many promises of support but only a few mechanisms and no clear institution to help countries implement their commitments.

Science must be at the heart of the WEO as many of the emerging environmental issues are coupled with development therefore requiring innovative and progressive approaches in dealing with them. The science must also be inclusive with wider participation of developing country scientists and universities.

We need a WEO that will help develop new ideas, share experience and assist countries to make a transition to a Green Economy. We have to help the poorest nations become partners in a Green Economy and not create a parallel development track, one for the haves and one for the have-nots.

A WEO must be the anchor that can rationalize current environmental governance and ensure that developing countries are equally represented and able to participate in the system within their own financial means.

If we agree that these are the elements of a new system then we need to engage in the debate and form a proposal that takes our needs as developing nations to Rio+20. Malaysia, as an advanced developing nation, has a lot of experience it can bring to the table. It should lend its experience to lead developing nations to form a position around their needs.

Otherwise, let's not complain if we end up with yet another global organization that is established without our needs in mind, or worse, with the status quo which is marginalizing the developing country's brothers and sisters.



ADNAN AMIN
 Director General,
 International Renewable Energy Agency

Powering the Green Economy

Embracing renewable energies can achieve the sustainable and inclusive economic development that the world increasingly seeks. There has been much recent discussion about the possibilities of a transition to a “Green Economy” that could foster economic growth and job creation while protecting the environment and achieving social inclusion. The Rio+20 UN Conference on Sustainable Development in June will promote renewable energies, and there are already encouraging signs that many governments around the globe are taking steps towards building strategies that could help them promote growth while shifting to a less carbon-intensive and more equitable path.

By developing renewable energies we can place the world on a path to sustainable clean energy, cut emissions of greenhouse gases and benefit the environment. In the developing world, renewable energies not only help lift isolated rural communities out of poverty, creating opportunities and jobs, but can have a fundamental role in addressing energy security and climate change. Many economists say a move to renewable energies could be the turning point that is needed to drag western economies from the brink of a long-term recession. Renewable energies are a source of diversified economic growth and job creation: more than 3.5 million people are already employed in renewable energy industries.

According to the IEA's World Energy Outlook 2011, as many as 1.3 billion people in developing countries, 84 per cent of them in rural areas, lack access to electricity and the opportunities it provides. This is a major issue, particularly in Africa. Renewable energies'



“Renewable energies provide countries with the possibility of achieving a more sustainable energy mix while preserving the environment and reducing the impact of fuel price volatility, especially on the poor.”

policy framework to support their market development.

Energy security is a major area of concern for both developed and developing economies. The rising prices of fossil fuels – and expectations that their supply and demand balance will remain quite tight in the coming years – clearly concern governments around the world. Least Developed Countries with a high dependency on fossil fuels have been particularly affected as rising prices and the costs of imports hit their fiscal balances. Adopting renewable energy can reduce energy costs. The established understanding that new energy sources take many years to become cost-effective does not apply to renewable energy, where the relative simplicity of both established and innovative technologies puts them well within the investment scope of developing nations.

Renewable energies provide countries with the possibility of achieving a more sustainable energy mix while preserving the environment and reducing the impact of fuel price volatility, especially on the poor. Yet energy laws have historically been designed to privilege conventional fuels. Subsidies for them around the

world, for example, are in the range of \$300 to 500 billion per year, translating into an unprecedented level of market distortion. Deploying renewables has also been limited by insufficient technical and administrative knowledge, and limited access to information on their potential to meet global energy needs. IRENA has a fundamental role in levelling this playing field, providing knowledge and know-how and facilitating the flow of information and best practices so as to realise renewable energies' huge potential and move us forward to a greener world. It can also help countries break down the many political, economic, institutional and market barriers that limit the widespread use of these technologies.

IRENA is developing information and indicator platforms for this. It is coordinating, for example – in partnership with the Clean Energy Ministerial Multilateral Solar and Wind Working Group – the development of the Global Solar and Wind Atlas, which will provide comprehensive energy potential data for planning the transition to renewable energy systems.

These are exciting times for renewable energies. The latest Renewable Global Status Report showed that by early 2011, they represented as much as one quarter of the world's power capacity. Global investment in 2010 reached \$211 billion, up 32 per cent from the previous year – with substantial technological and costs improvements, particularly in solar. Admittedly, a large proportion of these resources have been invested in specific areas, particularly the United States, China and Europe – but IRENA aims to capitalise on their experience and foster cooperation at global, regional and national levels, sharing knowledge, enabling policies, enhancing capacity, and encouraging investment, technological development and innovation. In the end, renewable energy is one of the best hopes we have for achieving a more sustainable and inclusive future.

modular nature – and their frequent ability to operate without centralised infrastructure – can make them particularly effective in reaching the poorest first. Energy is much more than access to a service to the rural poor: it means the opportunity to release their potential, improve their economic conditions and enjoy the benefits of better health services, education and communications – essential elements of sustainable development.

The International Renewable Energy Agency (IRENA) is truly committed to energy access, especially to the isolated rural poor. Last July 2011 it organised the IRENA-Africa High Level Consultations on Partnerships on Accelerating Renewable Energy. It has recently concluded Renewable Readiness Assessments (RRAs) in two pilot countries in Africa, and is now planning to expand this initiative to other countries on the continent, and in the world. RRAs are designed to provide a holistic assessment of the conditions for renewable energy deployment in a country and to identify the necessary elements for devising an effective

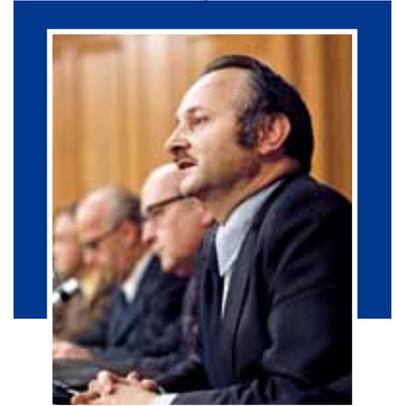
people

Maurice F. Strong first worked with the United Nations as a junior officer in 1947, when he was just eighteen, and returned in June 1972 to lead the Conference on the Human Environment in Stockholm, Sweden. It was the UN's first major conference on international environmental issues and resulted in the founding of the UN Environment Programme (UNEP). Six months later Mr. Strong was elected by the UN General Assembly to become UNEP's first Executive Director at its new headquarters in Nairobi, Kenya, where until 1975 he played a critical role in globalizing the environmental movement.

Mr. Strong served on the board of directors for the United Nations Foundation, a UN-affiliated organization established by Ted Turner's historic \$1 billion donation. He is also a director of the World Economic Forum Foundation, Chairman of the Earth Council, former Chairman of the Stockholm Environment Institute, and former Chairman of the World Resources Institute.

In his native Canada, Mr. Strong's career has spanned over five decades at some of Canada's most prestigious companies. He has run several companies in the energy and resources sector, including the Power Corporation of Canada, Ontario Hydro, and Petro-Canada (the national oil company). He is currently the chairman of Technology Development, Inc., which funds research in the groundbreaking field of applying nanotechnology towards creating energy sources that are both affordable and ecofriendly.

Mr. Strong's deep interest in for China over the past 40 years has taken him to the country in various capacities. He is currently an active honorary professor at Peking University and Honorary Chairman of its Environmental Foundation and Chairman of the Advisory Board of the Institute for Research on Security and Sustainability for Northeast Asia.



Mostafa K. Tolba led Egypt's delegation to the Stockholm Conference on the Human Environment in 1972, thus starting a lifetime commitment to environmental issues. Immediately after the meeting, he was nominated as Deputy Executive Director of the newly established UN Environment Programme. Within two years, he became its Executive Director — a post he held until retiring at the end of 1992.



Under his leadership, UNEP became the core organization within the UN family which acted as the catalyst for spurring governments, businesses, academia, and non-governmental organizations, to take meaningful action in protecting the environment.

Few if any in the global community would dispute the singular role played by Mr. Tolba in the creation of the Montreal Protocol. For that reason, he has certainly earned the moniker of "father of the Montreal Protocol". His knowledge as a scientist, his skills as a negotiator, and his techniques of persuasion enabled him to bring people together to achieve what was thought to be unachievable and which contributed to UNEP's most widely acclaimed success — the Montreal Protocol — the historic 1987 agreement to protect the ozone layer, which is recognized as setting a precedent for international preventive rather than corrective environmental action.

In 1994, he established in Egypt the International Center for Environment and Development (ICED), a non-profit organization, which finances environmental projects in less developed countries through an endowment fund administered by an independent board of trustees.

Elizabeth Dowdeswell has had an extensive career in government, education and international affairs. From 1993 to 1998 she served as UNEP Executive Director where she was instrumental in developing programmes in state-of-the-environmental assessments and reporting, environmental law, and tackling new issues of trade and globalization.



Before joining the United Nations, Ms. Dowdeswell was the Assistant Deputy Minister of Environment Canada from 1989 to 1992, responsible for the national weather and atmospheric agency. In that capacity she played a leading role in global efforts to negotiate the treaty on climate change adopted at the 1992 United Nations Conference on Environment and Development. She was also Canada's permanent representative to the World Meteorological Organization; a principal delegate to the Intergovernmental Panel on Climate Change; and the Canadian Chair of the Great Lakes Water Quality Board.

More recently, Ms. Dowdeswell's professional activities have included being a Visiting Professor in Global Health, Genomics and Ethics at the Joint Centre for Bioethics in the University of Toronto; Commissioner of the Commission on Globalization; and Associate Fellow of the European Centre for Public Affairs.

Ms. Dowdeswell serves as a Pierre Elliot Trudeau Foundation mentor, helping to guide the public policy research of Trudeau scholars, and is the author of numerous publications in both popular press and professional journals.

Klaus Töpfer, who is widely recognized as having spearheaded environmental policy as Minister of Environment in his home country, Germany, became UNEP's Executive Director and Director-General of the United Nations Office in Nairobi, Kenya, in February 1998. During his eight years as Executive Director, Mr. Töpfer presided over a period in UNEP's history that has seen environmental sustainability become front page news and central to international development goals.

Among the milestones of his tenure are a number of important environmental agreements, including the Cartagena Protocol on Biosafety, which addresses issue of genetically modified organisms, and the Stockholm Convention on Persistent Organic Pollutants. Mr. Töpfer was also closely involved in behind-the-scenes negotiations in support of the Kyoto Protocol on climate change, which entered into force in February 2005.

Mr. Töpfer continues to stress his belief that environmental policy is the peace policy of the future and that it is crucial that we create a culture of cooperation and mutual respect between north and south, rich and poor in order to avoid ever-growing tensions in a world where water and other vital resources can no longer be taken for granted.

In 2009 Mr. Töpfer was appointed founding director of the Institute for Advanced Sustainability Studies (IASS), Potsdam, Germany, which does research on climate problems and sustainable economics. He is currently a member of the Advisory Board of the German Foundation for World Population and on the Advisory Board of the Holcim Foundation for Sustainable Construction.





Opening the Eye



JACQUELINE MCGLADE
Executive Director,
European Environment Agency

There has been an explosion of information about the environment around the world. Much of it is distributed openly - but it can still be lost for lack of an easy way to share it with others. How can we best use advances in information and communication technologies to generate an up-to-date view on the state of the environment?

Society is increasingly interested in – and politicians committed to – securing a healthy environment. Economic prosperity and human health are tightly bound up with it. So it is very important to build up the knowledge base to demonstrate this in the face of today's financial crisis and a rapidly changing world. The challenge is to bring together information from the huge diversity of sources in a simple and yet reliable way.

The European Environment Agency has focused, since its creation, on reaping the benefits of advanced technologies to support its mandate to provide high-quality, timely and reliable environmental information to those who need it most. It is now doing this more than ever, through Eye on Earth, a newly launched global public environmental information service which was showcased in December. It meets the challenge by providing a web service where a broad diversity of information can be brought together in one place, so that it can be used and shared worldwide. It also offers



“Perhaps the most revolutionary of all, a set of applications called Watches allows everyone to participate in monitoring their environments and sharing what they find. Noisewatch, Airwatch, and Waterwatch can already be downloaded onto a smartphone or run on a computer – and used to send an observation from wherever a participant may be.”

online web applications to allow users to manipulate datasets to create new knowledge on demand – information that people need to better understand the state of their environment and to respond to changes in it.

Eye on Earth is also a networking tool. The EEA has already uploaded large quantities of data, maps, assessments and ways to view them. But that has only been the start. Historical and real-time data from a broad range of other organizations and institutions – including UNEP, the European Commission, the US Environment Protection Agency, the Russian Federation and Abu Dhabi’s Environment Agency – have also already been uploaded. In December, many others pledged to bring their data online. Most importantly, UNEP agreed to use it to power UNEP-Live – its web-based platform for organizing and accessing environmental information and knowledge in its historical assessments.

The richer the diversity of data providers, the greater Eye on Earth’s usefulness will be. New understandings can emerge just from combining maps and information from different sources in a simple drag and drop movement. Bringing together data on ship traffic in Europe’s seas with an EEA map of marine protected areas in this way – a straightforward and quick process using Eye on Earth web tools – revealed that a high volume of shipping goes right through them. This raised awareness and demonstrated the need for further investigation of the harm that could be caused.

Perhaps the most revolutionary of all, a set of applications called Watches allows everyone to participate in monitoring their environments and sharing what they find. Noisewatch, Airwatch, and Waterwatch can already be downloaded onto a smartphone or run on a computer – and used

to send an observation from wherever a participant may be. People can send in their estimation of the cleanliness of the waters at a local beach – helping others to decide whether to visit it or not – of how clean their air is, or of how noisy a particular neighbourhood becomes in the middle of the rush hour. Citizens who have downloaded the noisemeter from the Eye on Earth website or the EEA onto a smart phone, and sent in the measurements they made, are already helping cities and countries determine how noisy certain environments are and increasing understanding how to improve local living conditions. And later this year Naturewatch will enable them to report whether a plant, bird or animal is a local or invasive species.

Sharing is everything. It’s a prerequisite for expanding and strengthening the global knowledge base so as to support the healthy environment we all depend upon. Eye on Earth will make this happen.



Banking on Africa's opportunities

THE PROBLEM

Despite huge growth in the carbon market (globally, \$142 billion in 2010), Africa has seen very little investment from it. The continent has just two per cent of the registered projects in the Clean Development Mechanism (CDM) pipeline, and lags behind countries such as China, India and Brazil. This is a worrying trend because carbon finance can be an important tool in catalyzing investment in clean energy, which is much needed in a continent where many people do not have access to reliable energy supplies. But there is limited capacity and limited finance for these kinds of projects in Africa, and this has resulted in high transaction costs and a limited appetite among investors who may view Africa as a high risk or who may be unaware of the many opportunities that exist in a continent of developing economies.

THE SOLUTION

UNEP set up the African Carbon Asset Development Facility (ACAD) in 2009. Its aim is to unlock the potential of the African carbon market by helping the African finance sector understand how to incorporate carbon finance into their day-to-day lending activities and provide training on how to improve the flow of finance to clean energy investments.

IMPACTS

Through ACAD, UNEP has provided advanced carbon finance training for more than 250 employees of financial institutions through the African Bankers' Carbon Finance and Investment Forum and regional workshops in Sub-Saharan Africa. Several of the financiers trained now have their own projects in the CDM pipeline and have used the knowledge gained to advance their projects and search for

“Entrepreneurship can transform markets, but support for ecoentrepreneurship remains weak in many countries, particularly across Africa.

Developing private sector skills and mainstreaming the concepts across commercial finance and investment are key to realizing Africa’s abundant renewable energy and climate mitigation potential.”

Brigitte Burnett,
CSR Director, Nedbank

carbon buyers. Also, ACAD has so far provided \$229,427 to 15 projects in Africa to help them advance through the CDM project cycle and move towards financial closure. These financial grants contribute to capacity development by helping provide high-profile role models that other project developers can use as a point of reference. One of the projects supported by ACAD has already been registered and overall, the projects supported will provide greenhouse gas emissions reductions of about 2 million tonnes per year. ACAD has also sponsored the secondment of a senior economist at the Johannesburg headquarters of Standard Bank, one of the largest banks in Africa, building carbon finance knowledge within three of the bank’s teams: project finance, power and infrastructure, and investment banking. This has allowed for training that is specific to the bank’s needs and has helped to increase lending for CDM projects.

SUPPORT

German Federal Ministry of Environment (BMU), through the International Climate Initiative.
Website <http://www.acadfacility.com/>



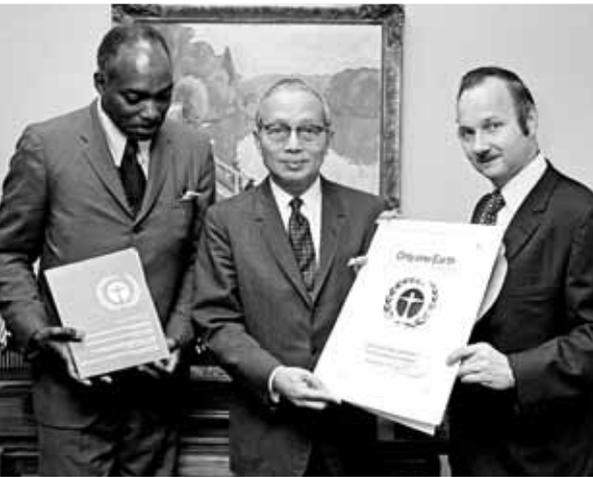
Oando Plc, one of Nigeria’s largest energy solutions providers, teamed up with investment firm Alitheia Capital on an innovative venture aimed at commercializing liquid petroleum gas (LPG). Alitheia took part in some ACAD carbon finance training events and later successfully applied for ACAD grant funding to help it get the project registered as a CDM project and to identify carbon buyers. LPG is a cleaner, more efficient fuel that can be used in the household to reduce the rate of deforestation and indoor smoke inhalation. In addition, its use will increase the income of local retailers.



CAMILLA TOULMIN
 Director,
 International Institute of Environment
 and Development

Life begins at 40!

UNEP was born in 1972, mandated to protect and improve the environment for current and future generations. The proclamation for its establishment notes that “humankind has acquired the power to transform the environment in countless ways and unprecedented scale” – and indeed the forty intervening years of this Anthropocene age have generated major changes in facts, technology and ways of looking at the world. In that year of the Stockholm conference on the human environment, the planet hosted 3.8 billion people, as against 7 billion today; a barrel of oil sold for \$3.50 compared to more than \$100 now. The year also witnessed US President Nixon’s visit to China, symbolising the massive geopolitical shifts that have since taken place.



© UNEP

The early 70s also witnessed the start of the modern environmental movement. The Club of Rome's landmark Limits to Growth spurred a set of debates which spawned Friends of the Earth and Greenpeace. The International Institute for Environment and Development (IIED), which I have directed since 2004, was established in 1971 by the economist Barbara Ward, who wrote Only One Earth for the Stockholm Conference. Like many in similar positions today, my professional training and career span the period from the early 70s to today – we share a common understanding of the problems and underlying drivers – and yet have not made sufficient headway in building a more sustainable planet. Much more is needed in the ten years ahead to marshal the evidence and contest the interests that block progress.

UNEP has had to tread a difficult path over the last four decades – both holding the torch for environmental matters within the UN system, while needing to be nimble in a rapidly changing landscape. Back in 1972, many of us believed that government was well-informed and farsighted, and could be relied upon to take decisions for the greater public good – in contrast to business, which pursued its own short-term interests. Science was largely uncontested and non-governmental organizations (NGOs) barely existed as a constituency within the UN system. Now it is clear that many

governments operate in a timeframe of days and weeks, while better corporate practice is thinking ten or twenty years ahead. Unwelcome evidence from the scientific community is cavalierly dismissed, and NGOs have mushroomed in size and numbers.

The facts have changed a lot over 40 years. Energy use has doubled in absolute terms but intensity per unit of GDP has fallen. Global GDP per head has more than doubled, and the proportion of people living in poverty (below \$1.50/day) has halved, from 50 per cent to 25 per cent. Yet, inequality has also risen with a significant shift in earnings from wage labour to investors with capital.

In 1972, China was still largely rural, and emerging from the Cultural Revolution. India and Pakistan were seeing the first impacts of green revolution technology in agriculture, with the spread of high yielding dwarf varieties of wheat and barley, which helped both countries shift from regular food shortages and famine to a regular harvest surplus. At the time, Norman Borlaug spoke of his plant breeding work having bought 40 years grace, by when new ways of achieving crop yield gains would be needed. The 2007-2008 food and commodity price spike has shown how tight are global supplies of basic grains, and how vulnerable poor people are to shortages in the global market, while recent studies show

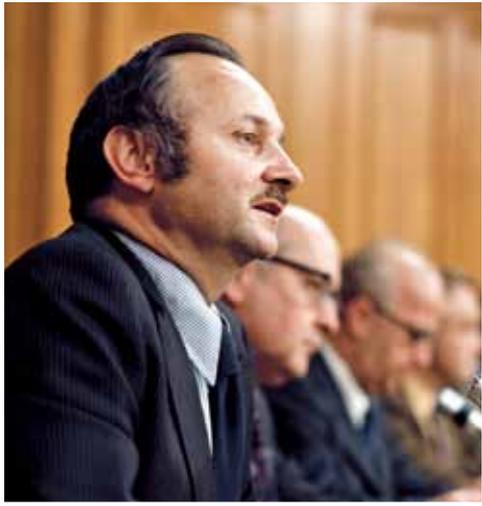


“The facts have changed a lot over 40 years.

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Yet, inequality has also risen with a significant shift in earnings from wage labour to investors with capital”





the difficult trade-offs involved in raising crop production further, given the need to contain greenhouse gas emissions and maintain ecosystem services.

In 1972, the greenhouse effect had long been identified as a potential threat, but with no sense of today's urgency. The principal environmental hazards were air pollution (including acid rain, now much improved), ozone depletion (now stabilised) and water quality and availability (still some way to go, especially in Africa). We lived free of laptop computers, mobile phones or fax machines.

The rapid tightening of information and financial connections since has generated an extraordinary growth in trade and financial transactions, and a thick web of communication networks, the power of which was evident in the recent Arab Spring.

When I did my first fieldwork thirty years ago in Mali, my little mud hut was six hours away from the nearest

telephone line, itself on a shaky connection to the capital Bamako, from which the outside world could be reached on a good day. Today, I can stand in the shade in Makono Dembele's compound, catching the signal from 30 kilometers away and chat to my office with sheep braying in the background. When the power gets low, a solar panel recharges the battery.

World politics and perceptions have also shifted enormously, from the Cold War years of the 70s through the western world's ascendancy in the 80s and 90s to today's much flatter, complex, multi-polar planet. Although Limits to Growth was widely decried at its time, there is a growing recognition that much of its forecast is turning out to be pretty accurate. Johan Rockstrom's work on planetary boundaries has re-ignited debate on where such limits might lie, our uncertainty as regards the science, and need to establish "safe space" within which to operate given the possible catastrophic impact of crossing thresholds for global warming and ocean acidification.

There is also now much more questioning of our economic models and underlying assumptions. Environment has inched from a bolt-on added extra to becoming more embedded in the fundamentals of the economy, thanks to the work of Nicholas Stern, Pavan Sukhdev, Amartya Sen and Joseph Stiglitz, demonstrating the need to price environmental assets and services properly to address market failure.



While IIED researchers David Pearce, Anil Markandya and Edward Barbier published *Blueprint for a Green Economy* in 1988, there was little pick-up by the mainstream economics community. Thanks to UNEP and others, green economic tools are now widely discussed, as is the role that government needs to play in shaping fiscal policy, procurement policy and pump-priming green investment funds. Some governments have begun testing alternative measures for gross domestic well-being: such tools must now be shaped to fit the needs and priorities of different nations: a Green Economy for Mali. Mozambique and Malawi will differ substantially from those for Kazakhstan, Qatar and Colombia.

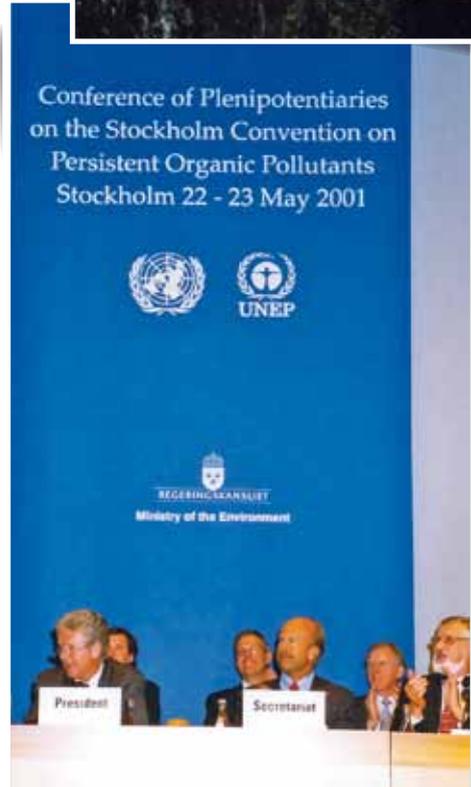
Throughout these tumultuous decades, UNEP has initiated and supported much valuable work in partnership with others, such as the Convention on International Trade in Endangered Species (CITES), the IPCC (with the World Meteorological Organization), the UN Global Compact (with UNDP, UNHCR and others), and the Millennium Ecosystem Assessment (with the World Resources Institute, World Bank and UNDP). It has not always got things right: in my own field, it espoused for many years a simplistic, overblown approach to desertification, showing massive sand dunes engulfing fields and

villages, obscuring the complexity of dryland management, and the positive lessons being learned. Relations with the Rio Conventions have had their ups and downs, with UNEP needing to co-exist with independent secretariats which many thought should fit within its bailiwick.

If Rio, the first Earth Summit held in 1992, marked UNEP's youthful coming of age, Rio+20 brings a moment for more sober assessment of how difficult it is to make sustainability happen. After 40 years, we can see more clearly how a combination of human and institutional characteristics push in the opposite direction: while people are capable of great co-operation and selflessness at times, they also exhibit greed and individualism, short-sighted and status-seeking behaviour. Animal spirits and instincts seem as powerful as reason and evidence. National and global governance systems are meant to contain such selfishness for the common good. Yet, powerful individuals and nations can block such a collective enterprise. Pointing out the alarming discrepancy between commitments and action on sustainable development more than a decade ago, Kofi Annan described our responses as "too few, too little, too late".

As background for Rio+20, UNEP has published *Keeping Track of Our Changing Environment*, highlighting the good and bad news since 1992. It is a mixed bag. There has been a rapid increase in renewable energy investment, but solar and wind still account for only 0.3 per cent of global energy supply, and 1 in 5 people on the

planet still have no access to electricity. Food production has risen by 45 per cent yet close on one billion people remain underfed, 1.5 billion are overweight and a third of all food is thrown away or wasted. In future we will have much less room for manoeuvre. On a planet where resources are increasingly scarce, we must set prices that properly represent the real value of resources and the costs of different behaviours. Only governments, acting together, can do that. UNEP has a vital role to play, in partnership with others, in clearly laying out the consequences of current practice and exhorting nations and their citizens to recognise their common interest in protecting and improving the environment for current and future generations.



UNEP at work

© UNEP



Targeting technologies

THE PROBLEM

Developing countries need access to advanced technologies to adapt to the consequences of a changing climate and yet at the same time achieve better economic growth and social development without adding to their greenhouse gas (GHG) emissions. There are significant barriers to the rapid adoption of such technologies, including high costs, import and export restrictions, inadequate government policies and regulations, and a lack of experience and knowledge to operate and maintain the technologies. All of these can hinder efforts to leverage the investments that would aid in the more rapid diffusion of climate friendly technologies. Hence, developing country parties to the United Nations Framework Convention on Climate Change (UNFCCC) are encouraged to undertake assessments of country-specific technology needs, known as Technology Needs Assessments (TNAs).

THE SOLUTION

Through its Technology Needs Assessments project, launched at the end of 2009, UNEP is helping 36 countries to identify the most urgent and highest impact technologies they need in a changing climate and to analyze the market and trade barriers that prevent them from accessing those technologies. The countries are also looking at their policy, institutional and financial options to overcome these barriers to prepare their National Technology Action Plan.

IMPACTS

With UNEP's support, regional centres now provide on-site support by visiting countries on demand and have set up an online helpdesk to answer questions, provide information, and facilitate the review of country reports. UNEP has also collaborated with the United Nations Development Programme (UNDP)

“For Senegal, the TNA project is a good way to have a view of the current situation of clean technologies in the country. The country hopes to produce a detailed Technology Action Plan which will be very useful tool for the implementation of programs and projects in many sectors.

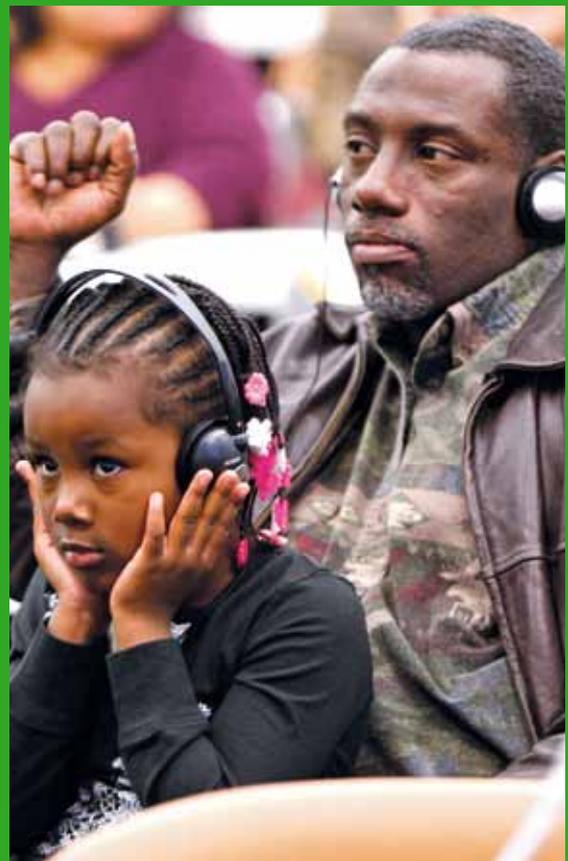
The TNA project can also facilitate the further preparation of the Nationally Appropriate Mitigation Actions and the updating of National Adaptation Programmes of Action.”

**Mass Ndour, TNA Coordinator,
and Mbaye Diagne, project
consultant, Senegal**

along with other organizations to develop the Climatetechwiki web platform through which finance and energy firms can access information on a broad set of mitigation and adaptation technologies. Some 15 countries have developed the expertise to prepare their Technology Needs Assessment and National Technology Action Plan. Seven countries have already prepared the list of prioritized technologies that they would like to see adopted and are in process of preparing their Technology Action Plans, which will help them implement the identified technologies in their countries. Another 21 countries will be involved in training workshops in 2011. Those 21 countries will benefit from the experiences of countries in the previous round through Tech-action, a web based platform gathering information on ongoing TNA activities. By assisting countries to articulate their technology needs, this project is accelerating the pace and relevance of technology transfer in those countries.

SUPPORT

Global Environment Facility Trust Funds and
TMA Norway.
www.tech-action.org/; www.climatetechwiki.org/



In Senegal, a national project coordinator and two team leaders have been trained to prepare the National Technology Needs Assessment and Technology Action Plan. An institutional framework with significantly enhanced opportunities for stakeholder participation in technology planning has been established. Senegal has reached a consensus on its technology priorities and is now looking at the barriers it faces to acquiring those technologies.



Bendy Solar Cells

Imagine decorating your bedroom walls with paper made from the same solar cells that now power your home. That is now the tantalising possibility thrown up by the development of lightweight solar cells that can be printed on paper and still conduct electricity. Researchers at the Massachusetts Institute of Technology printed them on untreated copy paper using a technique that could help slash the cost of producing solar cells.

Solar Street Lamps Feed Energy to the Grid

The humble street light is joining the ranks of wind turbines and solar power plants in supplying renewable energy to the electricity grid. A street lamp covered in photovoltaic cells, which can generate more energy from sunlight than it consumes to light the street, is being tested in the United Kingdom. And the lamp is already supplying electricity to the National Grid. The SunMast, developed by Scotia, based in Aarhus, Denmark, generates electricity from sunlight during the day, which it supplies to the grid. It then simply draws electricity back from the grid at night to power its light.



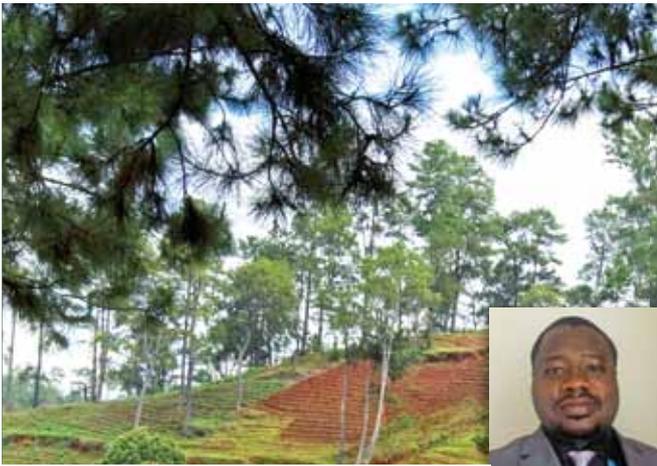
Bringing Forests to the Desert

It may sound like an environmentalist's pipe dream, but giant greenhouses could soon be popping up in some of the world's deserts, producing fresh drinking water, food and fuel. The Sahara Forest Project, which aims to create green oases in desert areas, has signed a deal to build a pilot plant in Aqaba, near the Red Sea in Jordan. With funding from the Norwegian government, the team plans to begin building the pilot plant on a 200,000 square metre site in 2012.

Air battery for electric cars

One of the biggest drawbacks with owning an electric vehicle (EV) is range anxiety, or a fear that the battery charge will not get them to their destination. Standard electric vehicles use lithium-ion (Li-ion) batteries, which are bulky and rarely provide 160 kilometres (100 miles) of driving before they run out. Now IBM claims to have solved a fundamental problem that may lead to the creation of a battery with an 800-kilometre (500-mile) range – letting electric cars compete with the gas guzzlers. Known as a lithium-air cell, it has theoretical energy densities more than 1,000 times greater than the Li-ion type. Several research prototypes have already been demonstrated and as part of Battery 500, an IBM-led coalition involving four US national laboratories and commercial partners, plan to have a full-scale prototype ready by 2013, with commercial batteries to follow by around 2020.





SUNDAY A. LEONARD
Special Assistant to the Chief Scientist



JOSEPH ALCAMO
UNEP Chief Scientist

Setting priorities

Policymakers, local to international, are confronted with more issues than they can possibly address and are therefore always busy setting priorities. How should they decide which global environmental issues most urgently require their attention? How can they figure out what is most important from the constant flow of new scientific findings about changes in the atmosphere, terrestrial environment, and hydrosphere, and how these changes relate to society? UNEP's answer is a "Foresight Process", a systematic approach to identifying and ranking emerging environmental issues.

In this process 'emerging' is used to denote issues already recognized as very important by the scientific community, but not receiving adequate attention from the policy

"These are only five out of 21 compelling issues identified by the UNEP Foresight Process.

This list is not meant to be the last word on what issues to work on, but does provide much to think about when considering priorities for policymaking over the coming years."

community. An issue is judged to be "emerging" if it stems from new scientific knowledge, accelerated rates of impact, heightened level of awareness or new ways available to respond.

The Process involved lively debates among a Foresight Panel of 22 distinguished scientists from around the world, looking at issues from all sides, and challenging their importance and timeliness. It produced a preliminary list, which was further commented on by an additional 428 scientists worldwide.

All this resulted in a list of 21 priority issues (See Table, page 27). Most fall within such sustainability themes as food security, water issues, biodiversity, waste management, and so on, but others cut across these themes. These cross-cutting issues reflect the Panel's strong belief that it is important to look beyond the silos of individual themes and disciplines.

They include:

Aligning Governance to the Challenges of Global Sustainability.

The current system of international environmental governance, with its maze of interlocking multilateral agreements, is a product of the 20th century and is likely to be unsuitable for handling the 21st century's sustainability challenges. Some commentators believe that it lacks the necessary representativeness and accountability for the transition to sustainability, and that a much higher level of participation and transparency is needed. Others believe that its effectiveness must be urgently improved by streamlining intergovernmental decision-making. Although, it is not clear what system would work better, new models of governance – ranging from public-private partnerships to alliances of civil society groups – need to be examined.

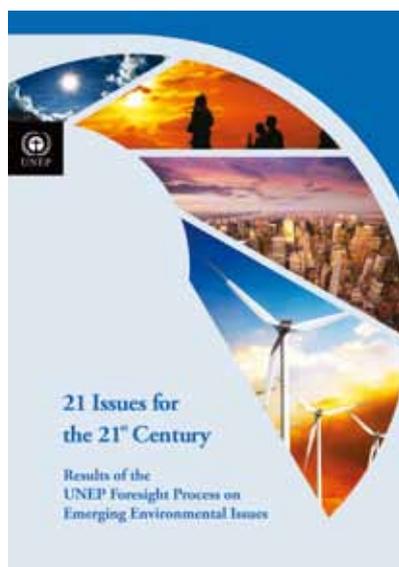
Transforming Human Capabilities for the 21st Century: Meeting Global Environmental Challenges and Moving Towards a Green Economy.

Society has already confronted a host of global environmental challenges and, through persistence and ingenuity, found many solutions. As new ones come up, the question is whether it has the right capabilities to find and implement solutions and support a burgeoning Green Economy. It particularly needs to make a special effort to fill in skills gaps in the green sector and update educational institutions to better cover sustainability work. It needs to train managers to respond to global environmental change better, and retool research to address the sustainability challenge in a more effective and integrated way.

Broken Bridges: Reconnecting Science and Policy.

Society needs strategies and policies underpinned by a strong

science and knowledge base if it is to cope with global environmental change. But many believe that linkages between the policy and science communities are inadequate or even deteriorating, and that these “broken bridges” are hindering the development of solutions. Improving communication, accessibility of scientific information, and other underlying causes of these broken links, will provide an atmosphere where scientists can better respond to society's needs. Policymakers will be better informed, and the public will benefit from evidence-based policies.



Social Tipping Points? Catalyzing Rapid and Transformative Change in Human Behavior for the Environment.

New findings from social science research have shown how damaging human behavior can be steered in a more positive direction, relatively quickly, by public policy. An example is the public's attitude towards cigarette smoking which has, in many countries, switched from being fashionable to being seen as a dangerous health threat within one generation. Can these insights

also be applied to transforming consumption habits that now lead to destructive environmental changes? What public incentives – economic, informative, prohibitive – would work best to achieve this? How can international environmental agencies help governments and other actors trigger sustainable consumption?

Coping with Migration Caused by New Aspects of Environmental Change.

Mass migrations of people have occurred throughout history, but some scholars now believe that it is increasingly influenced by the new factors of climate change and other global environmental changes. Even some policies to limit global environmental change, such as expanding the production of biofuels, may play a role in stimulating migration. Estimates of the number of future “environmental migrants” range up to the hundreds of millions, but these numbers are very uncertain and depend on the definition used. Regardless of the exact numbers, there is a high risk that environmental change will become an increasingly important factor (among others) in driving migration, and society should prepare itself for this eventuality.

These are only five out of 21 compelling issues identified by the UNEP Foresight Process. This list is not meant to be the last word on what issues to work on, but does provide much to think about when considering priorities for policymaking over the coming years.

The full Foresight Process Report can be downloaded at:

www.unep.org/publications/ebooks/ForesightReport/

Acknowledgement.

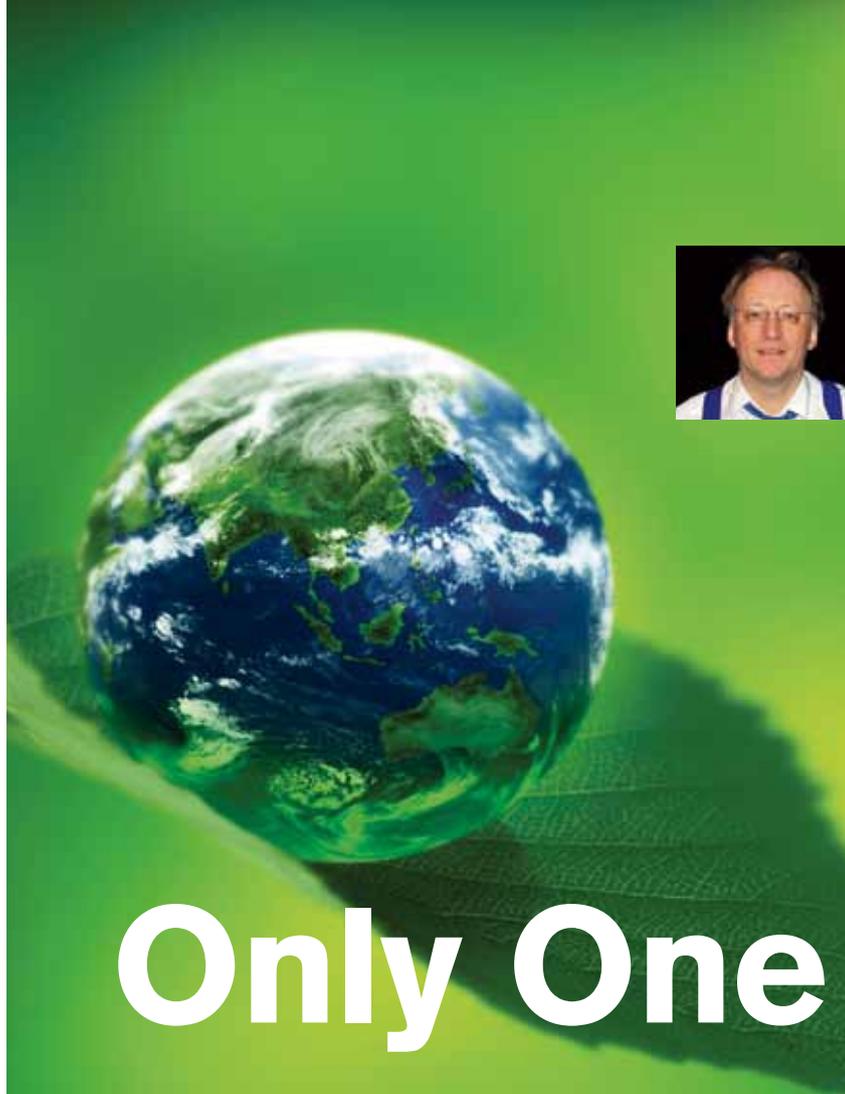
The authors are indebted to the UNEP Foresight Panel and other participants of the UNEP Foresight Exercise 2011 for elaborating the issues described in this article.

Ranking of 21 emerging global environmental issues according to the UNEP Foresight Process 2011

RANKING*	ISSUE TITLE
1	Aligning Governance to the Challenges of Global Sustainability
2	Transforming Human Capabilities for the 21st Century: Meeting Global Environmental Challenges and Moving Towards a Green Economy
3	New Challenges for Ensuring Food Safety and Food Security for 9 Billion People
4	Broken Bridges: Reconnecting Science and Policy
5	Social Tipping Points? Catalyzing Rapid and Transformative Change in Human Behavior for the Environment
6	New Insights on Water-Land Interactions: Shift in the Management Paradigm
7 **	Accelerating the Implementation of Environmentally-Friendly Renewable Energy Systems
7 **	New Challenges for Climate Change Mitigation and Adaptation: Managing the Unintended Consequences
7 **	Beyond Conservation: Integrating Biodiversity Across the Ecological and Economic Agendas
10	Greater Risk than Necessary? The Need for New Approaches to Minimizing Risks of Novel Technologies and Chemicals
11	Boosting Urban Sustainability and Resilience
12	The New Rush for Land: Responding to New National and International Pressures
13	Potential Collapse of Oceanic Systems Requires Integrated Ocean Governance
14	Changing the Face of Waste: Solving the Impending Scarcity of Strategic Minerals and Avoiding Electronic Waste
15	Shortcutting the Degradation of Inland Waters in Developing Countries
16	Acting on the Signal of Climate Change in the Changing Frequency of Extreme Events
17	The Environmental Consequences of Decommissioning Nuclear Reactors
18	New Concepts for Coping with Creeping Changes and Imminent Thresholds
19	Coastal Ecosystems: Addressing Increasing Pressures with Adaptive Governance
20	Coping with Migration Caused by New Aspects of Environmental Change
21	Managing the Impacts of Glacier Retreat

* Ranking based on scoring of UNEP Foresight Panel after extensive deliberations and after consideration of polling results of over 400 scientists worldwide.

** Issues had equal score, therefore equal ranking.


FELIX DODDS

Executive Director of
Stakeholder Forum and
Chair of the 64th UN DPI NGO Conference

Only One Earth

Ours – future generations will surely decide – is the irresponsible generation. They will look upon 1992 to 2012 as a lost twenty years, during which we could have laid the foundations for a more sustainable world. Instead we have increased unsustainable consumption patterns in developed countries and exported them to developing ones, with increasingly negative and destructive impacts on the world's environment and on poor people. We knew the problems, we knew most of the answers – but we failed to scale them up to deliver what was needed.

Rio+20 must ensure we take a different economic path. And while the term 'Green Economy' has become controversial in some circles, it at last puts economic affairs on the table. I believe we should see it

as a just transition to one that puts sustainability and people, equity and fairness at its core.

There are clear parallels between the ecological and financial crises. Banks and financial institutions privatized gains and socialized losses. We are doing the same with the planet's natural capital. Our present lifestyles are drawing it down at irreplaceable rates from other parts of the world and from future generations. So what could Rio do?

Establishing Sustainable Development Goals (SDGs) has been tabled by the governments of Colombia and Guatemala. Integrating them with the Millennium Development Goals into a single post-2015 framework would be a vital outcome from Rio. Meanwhile a meeting hosted by the

government of Monaco has suggested that one SDG should focus on oceans, addressing "all the sectors that rely on ocean resources and space but urgently need to be integrated and made sustainable to continue the provision of their economic, social and environmental services; and to raise the living standards of deprived communities". Other areas might include energy, biodiversity, food security and nutrition, water, urbanization, sustainable consumption and production. The goals should have universal application and build on Agenda 21 and the Johannesburg Plan of Implementation.

The lack of funding for implementing these two agreed programmes is already facing us with huge challenges. If Rio+20 is to succeed, Rio money must be put

on the table to fund a move towards an economy based on sustainable development.

Support for introducing a financial transaction tax has grown in Europe, and the Eurozone might go ahead with one. It could help governments refinance themselves, while taking money from those who caused the present problems, and should surely be used to support the needed transition.

Last September, Maurice Strong suggested developing an Earth Bond. “We should now” he said, “tap private sources, giving them opportunities to invest in the Green Economy by purchasing Earth Bonds, the proceeds of which would be invested in sustainable development projects in developing countries.”

Simon Zadek suggests amending the sovereign wealth funds’ Santiago Principles to include sustainable development criteria. Such funds – amounting to \$4.7 trillion – could have a huge impact if targeted towards sustainable development.

Encouraging the Credit Rating Agencies to include sustainable development criteria in their rating systems could also have a big effect on changing corporate and government activities.

And at last year’s UN General Assembly, the UK insurance firm Aviva, along with fifty other companies, proposed that Rio should support establishing a Convention on Corporate Sustainability, under which corporations would either have to report sustainability impacts or explain why they chose not to. Such a convention – which has already attracted support from governments and stakeholders – should go further and deal with responsibility, principles of transparency and accountability.

The summit’s other main task will be to address the institutional framework for sustainable development. UNEP has had an amazing forty years helping to create our environmental legislative framework, while acting as the global advocate for environment. It has managed this with an inadequate budget and a lack of political will from governments, but with a deeply committed staff. It must now be strengthened to address the issues of today’s world, including upgrading it into a World Environment Organization which brings together all the environmental conventions into a coherent structure.

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After nearly twenty years it is clear that the UN Commission on Sustainable Development does not work. It has failed to deliver on its work programme since the 2002 Johannesburg World Summit on Sustainable Development. One bold and important suggestion is that there should be a Council of the UN General Assembly on Sustainable Development dealing with new and emerging issues.

The risk of a fragmented science base could be overcome by having an Intergovernmental Panel on Sustainable Development overseeing the Intergovernmental Panel on Climate Change, the Intergovernmental Platform on Biodiversity and Ecosystem Services and any future science panels. It could also address integrated modeling and scenario settings to ensure coherent information for decision makers and report to the new Sustainable Development Council.

Delivering sustainable development takes place locally. There should therefore be strengthening, re-establishment and creation of councils on sustainable development at all levels of government, producing a partnership that would provide an engine for implementation, monitoring and new ideas.

One of the successes of 1992 was developing a regional convention in Europe on Principle 10 of the Rio Declaration – access to information, public participation and environmental justice. Rio+20 could be the launching pad for securing renewed and more specific commitments by governments to the Principle through, for example, establishing regional conventions to provide enforceable access to information.

A fundamental revolution is needed, not in 40 years’ time, nor in only one country, but in the next ten years and across the globe. As Senator Robert Kennedy put it in 1968: “A revolution is coming – a revolution which will be peaceful if we are wise enough; compassionate if we care enough; successful if we are fortunate enough. But a revolution is coming whether we will it or not. We can affect its character; we cannot alter its inevitability”. Let’s work for a world built on sustainable societies, responsive citizens and accountable governments.

WWW Rio+20 and Sustainable Development: useful links

This page contains links to websites to help you research issues related to Sustainable Development. Our Planet magazine does not, however, endorse the viewpoints of any of the groups to which we link, and we cannot guarantee the accuracy of the information posted on these sites. Rather, we hope to provide you with a broad range of opinions and perspectives.

Earth Summits

Rio+20

www.uncsd2012.org/rio20/

The Conference will take place in Brazil on 20-22 June 2012 to mark the 20th anniversary of the 1992 United Nations Conference on Environment and Development (UNCED), in Rio de Janeiro, and the 10th anniversary of the 2002 World Summit on Sustainable Development (WSSD) in Johannesburg.

The 2012 UN Conference on Sustainable Development

www.facebook.com/UNRioplus20

To interact with the 2012 UN Conference on Sustainable Development.

UN Department of Economic and Social Affairs

www.un.org/en/development/desa/index.html

The United Nations Department of Economic and Social Affairs (DESA) and its predecessors have helped countries around the world meet their economic, social and environmental challenges for more than 50 years.

Sustainable Resources & Development

UNEP and the Green Economy Initiative

www.unep.org/greeneconomy/

UNEP's Green Economy Initiative provides a range of advisory services to more than 20 governments around the world. Underpinning all dimensions of the Green Economy Initiative is a focus on robust economic research and policy analysis.

International Institute for Sustainable Development

www.iisd.org/

IISD champions sustainable development around the world through innovation, partnerships, research and communications.

MDG-F Environment and Climate Change

www.mdgfund.org/content/environmentandclimatechange

Shows efforts contributing to achieving MDG 7 on environmental sustainability particularly the target of integrating the principles of sustainable development into country policies and programmes and reversing the loss of environmental resources.

REN21

www.ren21.net

REN21 convenes international multistakeholder leaders to enable a rapid global transition to renewable energy. REN21 promotes renewable energy to meet the needs of both industrialised and developing countries that are driven by climate change, energy security, development and poverty alleviation.

IRENA

www.irena.org

Recognising the huge potential of renewable energy, IRENA's Member-States have joined together to establish an international organization dedicated to facilitate the rapid development and deployment of renewable energy worldwide.

World Business Council for Sustainable Development

www.wbcsd.org/about.aspx

The WBCSD is a CEO-led organization of forward-thinking companies that galvanizes the global business community to create a sustainable future for business, society and the environment.

International Institute for Environment and Development

www.iied.org/

IIED was launched in 1971 by renowned economist and policy advisor Barbara Ward, making it one of the very first organizations to link environment with development.

ICLEI - Local Governments for Sustainability

www.iclei.org/index.php?id=about

ICLEI is an association of over 1,220 local government members, who are committed to sustainable development.

Sustainable Energy Finance Initiative (SEFI)

www.sefi.unep.org/

SEFI provides financiers with the tools, support and global network needed to conceive and manage investments in the complex and rapidly changing marketplace for clean energy technologies.

UNEP Risoe Centre on Energy, Climate and Sustainable Development

www.uneprisoe.org/

UNEP Risoe supports UNEP in its aims to incorporate environmental and development aspects into energy planning and policy worldwide.

UNEP's International Resource Panel

www.unep.org/resourcepanel/

The International Resource Panel was set up in 2007 to develop holistic approaches to the management of global resources.

UNEP's Energy website

www.unep.org/themes/energy/

Information on UNEP's key activities to address the environmental consequences of energy production and use at the global and regional levels.

UN Environment Programme 40th Anniversary

www.unep.org/40thAnniversary/

In celebration of UNEP's 40 years, the website marks key events, negotiations and experiences that have taken place and includes photos of the times.

numbers

1972

13%
of global energy supply comes from renewable energy sources — **Keeping Track of our Changing Environment: From Rio to Rio+20, UNEP**

UNEP established after Stockholm UN Conference on the Human Environment and provides global leadership and encourages partnership in caring for the environment

2%-5%
of the rural population in Sub-Saharan Africa are connected to the grid compared to 98 per cent in Thailand — **UNEP Finance Initiative 2012**

66%
of all new electricity generated in sub-Saharan African after 1998 has come from renewable sources — **UNEP Finance Initiative 2012**

40%
of the world's population now lives within 100 kilometers of the shoreline — **UNEP Green Economy in a Blue World**

2%-5%
of the rural population in Sub-Saharan Africa are connected to the grid compared to 98 per cent in Thailand — **UNEP Finance Initiative 2012**

30%
of the world's fish stocks are overexploited, depleted or recovering from depletion — **UNEP Green Economy in a Blue World**

4 million
estimated child deaths globally per annum due to environmental hazards. — **UNEP Annual Report**

13.1 billion
tonnes of waste — 20 per cent more than present levels — is projected will be produced in the world by 2050 — **UNEP Annual Report**

12 Billion
trees planted by UNEP's Billion Tree Campaign worldwide before officially being handed over to the Plant for the Planet Foundation — **UNEP Annual Report**

85%
of rural population in Sub-Saharan Africa relies on biomass for energy. — **UNEP Finance Initiative 2012**

30,000%
increase in solar energy supply since 1992 — **Keeping Track of our Changing Environment: From Rio to Rio+20, UNEP**



Acting Local



KONRAD OTTO-ZIMMERMANN
Secretary General,
ICLEI – Local Governments
for Sustainability

Two decades after the Rio Earth summit adopted its landmark Agenda 21 ('think global, act local'), the world population has grown from 5.5 billion to 7 billion people. The challenges postulated in Stockholm (1972) and glimpsed in Rio (1992) are today fast becoming a reality. To tackle these 21st century challenges, a strengthened UNEP could be a frontrunner in facilitating the full participation of all key stakeholders for sustainable development, and thus harnessing their potential to affect change.

While governments remain crucial actors for environmental issues at local, regional and national scale – and UNEP plays an important role at the global scale – the public sphere alone cannot effect all necessary change alone. Civil society and the private sector have crucial contributions to make, especially in the implementation of decisions and action on the ground.

Rio+20 in June 2012 provides the rare opportunity to address sustainable development issues in a unique global setting. In order to address the severe, complex and interconnected challenges that the world is facing, all actors must work together. Only then does the world have a chance to make the changes our planet urgently needs. This entails the involvement of Local Government Organizations (LGOs) in strengthening the UNEP amongst other relevant fora.

LGOs have significant powers in environmental matters and thus can help to implement global agreements, shape policy, and ultimately contribute to safeguarding global common goods. Each local government can only act locally, but when united and working together through global LGOs, the accumulated impact is significant and should be harnessed by the UN and its member states by meaningfully involving LGOs in a strengthened UNEP.

When the UN Conference on Environment and Development adopted Agenda 21 in 1992, it included a section on “Strengthening the roles of Major Groups”. The nine Major Groups that are recognized in Agenda 21 are Business and Industry, Children and Youth, Farmers, Indigenous Peoples, Local Authorities, NGOs, Scientific and Technological Community, Women, Workers and Trade Unions.

Whilst the involvement of Major Groups has enriched the debates at various UN platforms and brought relevant voices to the table, the current structure demonstrates clear limitations: indeed, these nine Major Groups are very distinct and different from each other in their constituencies, capacities, and roles and mandates, yet they are being treated equally in the UN governance.

Local Governments are unique among those nine groups by being in charge of governing a defined territory and population with powers granted by the National or State Constitution. Local Government is the sphere of government closest to the people and local issues. Typically, Local Governments have the mandate to deal with issues such as land use and development planning, building permits, roads and public transport, water and sanitation, energy and many more which are of direct relevance to the local community. Cumulatively, Local Governments can make a relevant impact on global environmental matters. The combined expertise and viewpoint of Local Governments should be more appropriately linked to global environmental policy-making.

Local Governments are joining together nationally, regionally and globally as LGOs. While each individual Local Government focuses on its local issues, LGOs are familiar with international issues of relevance to local communities and can therefore help to build a

bridge between local and global policymakers. As the sphere of government closest to the people and often democratically elected, local governments often know best or see first which problems are being faced by their citizens.

LGOs also help to accumulate the information from hundreds of cities, towns and counties, thus helping to highlight topics which merit global attention. With over half of the global population living in cities, urban areas are also causing environmental problems. Around 80 per cent of total global greenhouse gas emissions stem from urban areas, for example.

“The impacts of some environmental crises are first or most directly faced by local communities. Local governments should therefore be heard in global discussions around environmental assessment, early warning and agenda setting in order to ensure that such issues are captured.”

Today’s cities are designed as extracting, resource-consuming systems and often organized in a way, which is not environmentally sound. Low urban density leads to large distances having to be covered, and often the infrastructure entices people to use cars to move around in cities. Designing cities more densely would allow for more environmentally-friendly modes of transportation like walking, biking and public transport. Urbanization as such is not new, but its increasing speed and scale have turned it into an emerging global issue. While in 1950 less than one-third of the world’s population lived in cities, by

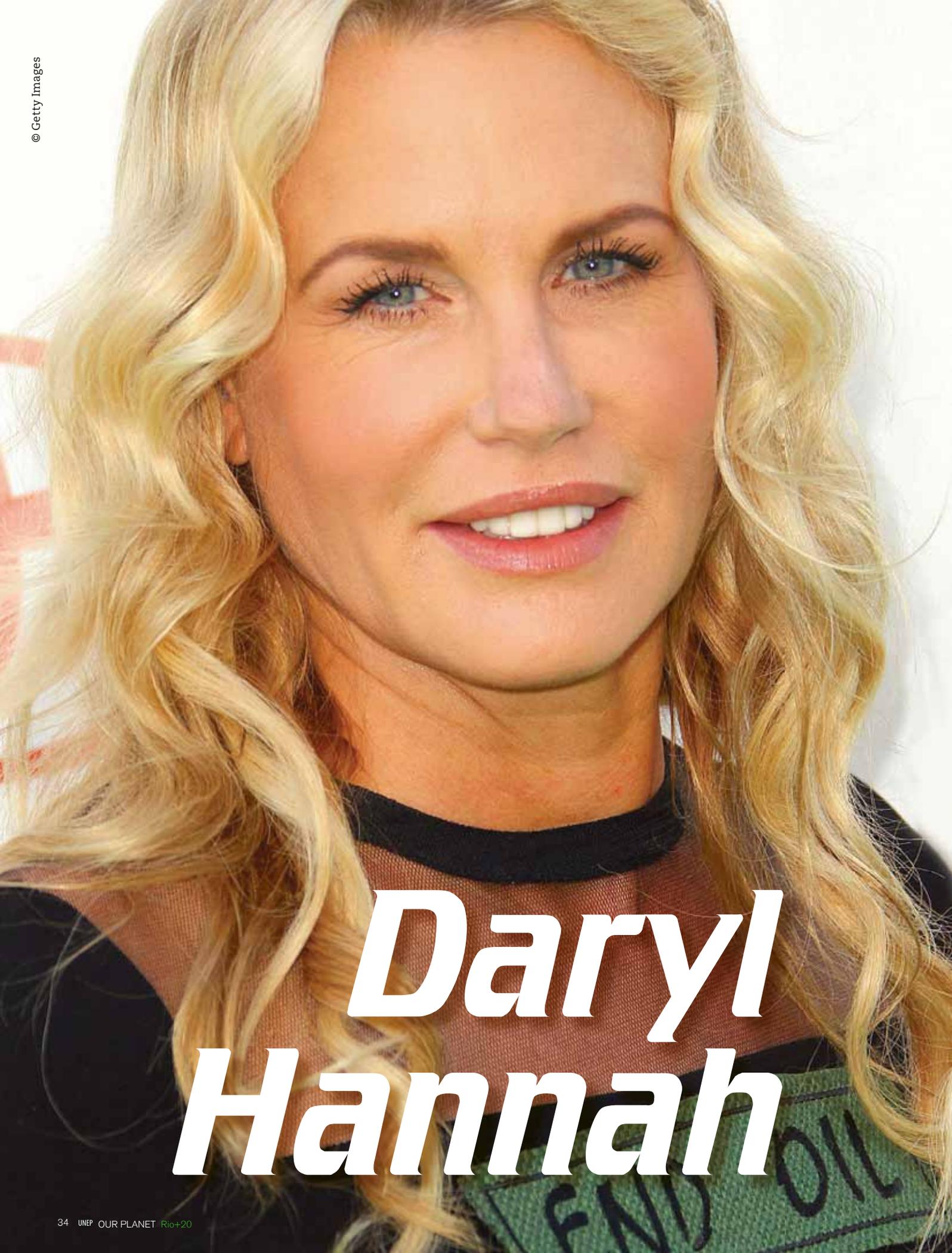
2050 over two-thirds of the world population will be living in urban areas.

The impacts of some environmental crises are first or most directly faced by local communities. Local governments should therefore be heard in global discussions around environmental assessment, early warning and agenda setting in order to ensure that such issues are captured. Moreover, local governments can play an active role in early warning. This could be done via a network of urban observatories, which can serve as UNEP’s “urban sensors” and report new issues and threats to UNEP, in UNEP’s role as global environmental authority with a mandate to keep the global environment under review.

The environmental departments of local governments are usually very well aware of local environmental challenges and efforts. LGOs and their associations can serve as a link between these local knowledge hubs and UNEP as the global knowledge hub. Based on this knowledge as well as on local governments’ significant capacity for implementing MEAs, LGOs should be more fully involved in global environmental policy-making, including in UNEP’s Governing Bodies. Detailed proposals for how this can be done have been developed.

One of the proposals for a strengthened UNEP is the establishment of a voluntary review mechanism for the implementation of multilateral environmental agreements (MEAs). If such a mechanism is established, it should include LGOs in its structure.

Rio+20 in June 2012 provides a platform to make the desired and necessary changes, such as the full inclusion of LGOs. We need all actors to work together in an efficient way if we want to reach the global goals we need in order to address current unsustainable trends and environmental threats.



Daryl Hannah

“...she grows a wide variety of produce, from potatoes to persimmons, pomegranates and passion fruit.”

“I just don’t want to be part of the polluting, fossil fuel economy”, says Daryl Hannah, the actress, and she has certainly been trying to kick the hydrocarbon habit for longer than most. For the last twenty years she has lived off the grid — and she is given to gulping down a glass of the sustainable biofuel on which she runs her classic Chevrolet El Camino coupe utility to emphasise that its toxicity is “somewhere between table salt and maple syrup”. She was talking to Our Planet at a ‘Slow Life’ environmental symposium, organised by the luxury resort company Six Senses at Soneva Fushi in the Maldives. Getting there naturally involved burning jet fuel, so as she freely admits, she has only partially succeeded. “I’m obviously not completely out of it because of travel and other things”, she says. “But I do try to keep it to specific areas, and being off grid means that I am opting out to a certain extent.” She buys carbon offsets for her travel and — since Sir Richard Branson outlined his plans to develop a clean aviation fuel at the same Symposium — she can perhaps look forward to the day when she may eventually be able to tick off that area too.

The *Splash* and *Kill Bill* star grew up on the 47th floor of a skyscraper in downtown Chicago which, she has said, made her so “disassociated and alien to the world” that she had “issues at school”. Her parents responded by sending her to summer camp in the Colorado Rockies for two months every year between the ages of 7 and 17 and there, in the wilderness, as she puts it, “found my centre”.

And it was to the Rockies that she returned to “overhaul” her lifestyle back in 1991, when— long before it became fashionable — she created a zero-carbon home. She restored an old stage coach station, berming

it into the landscape to provide added insulation; using non-toxic and recycled, and reclaimed materials; maximising passive solar energy; and installing solar photovoltaic

panels which supply almost all of its power (a generator running on sustainable biodiesel provides back-up).

Water comes from a spring and wastewater is recycled to the organic garden where — as a vegetarian since the age of 11 — she grows a wide variety of produce, from potatoes to persimmons, pomegranates and passion fruit. She has a compost lavatory, but no television and the finishing touch is supplied by a stone, covered in (periodically watered) moss from the original site which is used indoors as a couch.

“Twenty years ago, it wasn’t easy to find the right goods and services,” she says. “But it’s great, the bills are low and people say it’s beautiful. It’s a hard place to leave.” And though the homestead is tiny by Hollywood star standards, she doesn’t want anything bigger. “I don’t want 19 bathrooms. I like having it on a human scale.”

Even outside the home, she is determined to live sustainably. Her biodiesel for both house and car comes from the waste oil of local restaurants. “I know who makes my biofuel, how it’s made and how it’s processed “ she says adding that she can’t remember when she last visited a petrol station “except to use the restroom”. Her other car — her ‘*Kill Bill Trans-Am*’ — has been converted to run on alcohol.

She campaigns on many environmental issues — and has been arrested three times at various demonstrations in less than six years — but she insists: “It is a really good idea to start with yourself. Getting off fossil fuels is not just good for the planet; it’s good for you.”



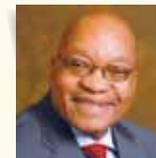
“We need a better **common understanding** of **Green Economy**, and **Rio+20** could get us closer to such an understanding.”
FREDRIK REINFELDT
 PRIME MINISTER, SWEDEN



“We are, therefore, **investing massive resources** to achieve our goal of a **Green Economy.**”
MWAI KIBAKI
 PRESIDENT, KENYA



“We will make all our efforts to consolidate our **clean energy**, which is an essential, **key asset** of Brazil.”
DILMA ROUSSEFF
 PRESIDENT, BRAZIL



“We have spoken a great deal about using **cleaner sources of energy**. Today we reaffirm that **commitment** and determination to move towards a **low-carbon economy.**”
JACOB ZUMA
 PRESIDENT,
 SOUTH AFRICA

1972-2012: Serving People and the Planet

www.unep.org/ourplanet

www.unep.org/gc/gcss-xii/

www.unep.org/40thAnniversary

