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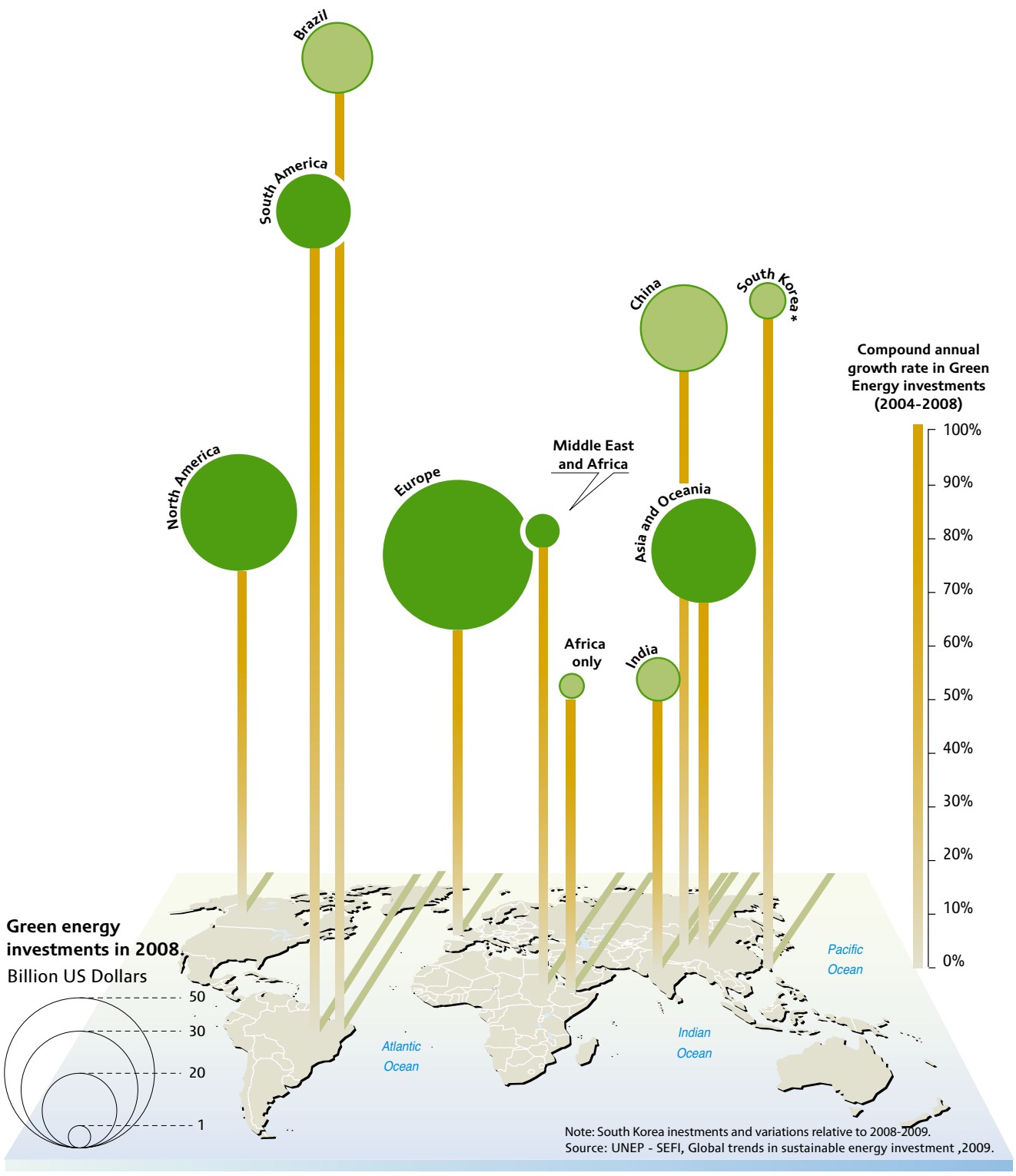

A new deal for a resource-efficient and Green Economy

By ***Achim Steiner***

If the recent food, fuel, financial and economic crises have taught us anything it is that narrow definitions and objectives for growth are unlikely to serve society well in the 21st century. Indeed, unless we put the green into growth we are in danger of repeating the mistakes of the past which have led in large part to the current economic crisis and have pushed millions back into hunger and poverty.

For the crises of the here and now will pale besides the ones to come if you layer on top of them, the climate and looming natural resource scarcity crises on a planet of 6 billion, expected to rise to over 9 billion by 2050. When the financial crisis occurred, employment was already a global major challenge, with 1.3 billion people under or un-employed, and another half a billion young people worldwide poised to join the job market over the next 10 years.

But though we cannot disregard the crises, something quite fundamental has also been happening in many countries, developed and developing alike.

The last 12 months have seen a markedly different discourse, and a set of responses that indicate a willingness to seize the opportunity to drive tomorrow's development by making the transition towards a Green Economy – if only we can hold our collective nerve and stick with it.

The multi-trillion dollar stimulus packages have served as adrenaline shots to save the ailing global economy for the time being. But some nations and regions, from Japan to China and the United States to Europe and Mexico are going beyond this – investing significant slices to revive economic activity that are expected to emerge fitter, leaner, healthier and with a smaller ecological footprint.

In short they are factoring in the broader economic, social and environmental opportunities possible via a transition to a low carbon, resource efficient development path. Take the Republic of South Korea – if you look at the stimulus there, the range of environmental investments and the systematic approach involving the public and the private sector, then perhaps this is the most comprehensive Green Growth package of them all.

South Korea's green deals target investment in renewable energy and transport but also ecosystems including freshwater and forests.

The close to $40 billion green stimulus is also expected to generate 1 million jobs by 2012 in areas from clean technology to natural resource management.

Meanwhile UNEP launched its annual global trends report under its Sustainable Energy Finance Initiative (SEFI) in June 2009. This report confirmed that investment in renewables in 2008 was $155 billion, higher for the first time than investment in new fossil fuel generation, at $110 billion. Investment in renewables was up from only about $35 billion in 2004. How many economists in the 1990s would have predicted such a turn-around? And by far the largest growth was not in the developed economies, but in China and India.

Other highlights, showing progress towards a Green Economy future include:

☞ On World Environment Day 2009, President Calderon announced that Mexico was taking on voluntary greenhouse gas emission cuts of 50 million tonnes of Co2 a year or a reduction of around 8%. He also announced that, with the right financing in place, this could rise to a reduction of close to 16%.

(CONTINUES NEXT PAGE)

Greening the world economy

Greening the world economy means turning markets and finance into partners in sustainable development. With the world in the grip of an ominous financial crisis, we are only just realising how important the way we manage our money can be for the future.

(CONTINUED)

☞ Brazil, with close to 50% of its energy already coming from renewable sources such as hydro and ethanol, announced a 30,000 to 40,000 megawatt wind power programme early 2009, which will be backed by incentives and market mechanisms.

☞ In July 2009, a consortium of some 20 firms started raising money for the African-European Desertec project – building solar collectors in an area of desert in the Sahara 800 kilometres square that receives enough sunlight to generate the whole world's energy needs.

☞ Kenya has announced plans to double its current installed electricity capacity by 2012 thanks to sources such as geothermal and wind power, but also drawing in part on its roughly 10% share of the Clean Development Mechanism in Africa.

☞ Also in Kenya, a private sector consortium is building sub-Saharan Africa's largest wind farm, with an initial installed capacity of some 300 megawatt whereas Tanzania is currently installing wind turbines equal to 10% of its current energy needs.

There is optimism and there is transformational change underway, but there is also a great deal of uncertainty. If a Green Economy is to be nurtured and sustained then several factors need to be continued or put in place. We need to make every dollar and euro, every rupee and peso work harder and on multiple fronts – that will really accelerate the transition towards a Green Economy that is here to stay, through decoupling and resource efficiency, getting more with less.

Let me make a few suggestions:

☞ The green stimulus packages need to be invested now, not in six months' time nor in two years' time – there is an urgent need to overcome the current credit crunch and the difficulties of raising finance via banks or on the stock markets – this was a central message from renewable energy developers on behalf of rich and poorer economies involved in the UNEP SEFI report mentioned earlier.

☞ There needs to be a greening of development cooperation – one of the recent surprises in Kenya was that the government was planning to bridge an energy gap by buying in diesel-generated power from independent power producers simply because the higher, up front financing of clean energy was not available. This is surprising given the fact that diesel electricity is more expensive per unit than geothermal electricity.

☞ Perverse subsidies, such as the over $250 billion-worth of fossil fuel subsidies, need to be reviewed and phased-down – there is little or no evidence they address poverty. The funds freed-up could be spent on clean technology and perhaps on climate adaptation investments – various estimates indicate that adaptation funding of between $28 billion to close to $90 billion is needed annually over the coming years. Phasing-out such perverse subsidies would also reduce greenhouse gas emissions by an estimated 6% and contribute to global GDP to the tune of 0.1%.

☞ Opening up, rather than protecting, markets is likely to accelerate the dispersion of clean technology and the transfer of climate-friendly technology from developed to developing economies. This was highlighted in a report on trade and climate change, which UNEP and the World Trade Organization released in June. The report estimates that one-third of Clean Development Mechanism projects involve technology transfer. It cites a study showing that between 1998 and 2008 some 215,000 patents were registered globally for low or zero-carbon technologies such as waste-into-energy, biomass, wind, wave and fuel-cell power.

☞ Above all, perhaps, it is of crucial importance for governments to seal a credible deal at the UN climate convention meeting in Copenhagen to raise the price of carbon and give certainty to the carbon markets.

At its heart the transformation towards a Green Economy is about ensuring that the full costs of pollution and environmentally-damaging activities are internalized rather than externalized – so that real choices can be made. At the same time, establishing a Green Economy is about more intelligent management of resources – financial, human and natural – thus ensuring that economies invest and re-invest in them to maximize resource efficiency and sustainable economic benefits, and achieve the best possible return for current and future generations.

The international community is only just scratching the surface in terms of capturing the true value of the Earth's natural or nature-based assets which underpin vast sectors of the global economy including agriculture. The Economics of Ecosystems and Biodiversity assessment – of which UNEP is proud to host the secretariat – estimates that in terms of forest ecosystem services alone we are losing services at a rate of $2 trillion to $5 trillion a year. The global community is also increasingly realizing the damages of our unsustainable consumption and production patterns through the Marrakech Process in active collaboration with all the regions for defining an adequate enabling policy framework and setting the foundations for a truly culture of change. This is being further mainstreamed through the UNEP International Panel for Sustainable Resource Management in demonstrating the necessity to decouple throughout a life cycle approach.

A good deal in Copenhagen is therefore also very important as it will likely stimulate investment in forest ecosystems with multiple opportunities including reduced greenhouse gas emissions, soil stabilization, improved water supplies and reduced biodiversity loss. This may open the door to investing in other ecosystems for their climate benefits with multiple spin offs. This deal should also give due consideration to reducing greenhouse gas emissions from the building sector, one of the largest consumers of energy and producers of CO_2.

The world has had a serious wake-up call in terms of the global economy and its current trajectory – the vulnerable are being hit the hardest with an estimated 100 million people likely to be plunged back into poverty and a record 1 billion people expected to be hungry by the end of 2009.

But governments have re-engaged not as meddlers – as some purists might claim – but as managers on the global stage. And we are seeing a fresh set of values and a serious discourse re-emerging in terms of what is real wealth for the many, rather than for only a few.

Come what may, the international community is going to have to embrace a Green Economy – the question is whether it does so in a timely, focused and well-directed way. Or whether it will come by default, forced upon policy-makers by the world rapidly running out of resources, from fisheries to forests, while struggling under the yoke of unchecked climate change.

The current stimulus packages and rising green investments represent a striking, perhaps once-in a life time opportunity to achieve that stable and sustainable transition if these investments can be fully realized and backed by forward-looking policies and measures over the medium to long term. The packages can, and indeed are, driving more sustainable consumption and production patterns. They are also driving to more sustainable markets that in turn are triggering demand for more sustainable Green Growth technologies, goods and services that are giving rise to the kinds of sustainable businesses, industries and jobs we need in this new millennium

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Green growth is essential to any stimulus

*By **Ban Ki-moon** and **Al Gore***

This article was originally published in the Financial Times 16th February 2009 (www.ft.com)

Economic stimulus is the order of the day. This is as it must be, as governments around the world struggle to jump-start the global economy. But even as leaders address the immediate need to stimulate the economy, so too must they act jointly to ensure that the new de facto economic model being developed is sustainable for the planet and our future on it.

What we need is both stimulus and long-term investments that accomplish two objectives simultaneously with one global economic policy response – a policy that addresses our urgent and immediate economic and social needs and that launches a new green global economy. In short, we need to make "growing green" our mantra.

First, a synchronised global recession requires a synchronised global res¬ponse. We need stimulus and intense co-ordination of economic policy among all main economies. We must avoid the beggar-thy-neighbour policies that contributed to the Great Depression. Co-ordination is also vital for reducing financial volatility, runs on currencies and rampant inflation as well as for instilling consumer and investor confidence. In Washington last November, G20 leaders expressed their determination "to enhance co-operation and work together to restore global growth and achieve needed reforms in the world's financial systems". This needs to happen urgently.

Stimulus is intended to jump-start the economy, but if properly conceived and executed it can also launch us on a new, low-carbon path to green growth. Some $2,250bn (€1,750bn, £1,569bn) of stimulus has already been announced by 34 nations. This stimulus, along with new initiatives by other countries, must help catapult the world economy into the 21st century, not perpetuate the dying industries and bad habits of yesteryear. Indeed, continuing to pour trillions of dollars into carbon-based infrastructure and fossil-fuel subsidies would be like investing in subprime real estate all over again.

Eliminating the $300bn in annual global fossil fuel subsidies would reduce greenhouse gas emissions by as much as 6 per cent and would add to global gross domestic product. Developing re¬newable energy will help where we need it most. Already, developing economies account for 40 per cent of existing global renewable resources as well as 70 per cent of solar water heating capacity.

Leaders everywhere, notably in the US and China, are realising that green is not an option but a necessity for recharging their economies and creating jobs. Globally, with 2.3m people employed in the renewable energy sector, there are already more jobs there than directly in the oil and gas industries. In the US, there are now more jobs in the wind industry than in the entire coal industry. President Barack Obama's and China's stimulus packages are a critical step in the right direction and their green components must be followed through urgently.

We urge all governments to expand green stimulus elements, including energy efficiency, renewables, mass transit, new smart electricity grids and reforestation, and to co-ordinate their efforts for rapid results.

Second, we need "pro-poor" policies now. In much of the developing world, governments do not have the option to borrow or print money to cushion the devastating economic blows. Therefore, governments in industrialised countries must reach beyond their borders and invest immediately in those cost-effective programmes that boost the productivity of the poorest. Last year, food riots and unrest swept more than 30 countries. Ominously, this was even before September's financial implosion, which sparked the global recession that has driven a further 100m people deeper into poverty. We must act now to prevent further suffering and potential widespread political instability.

This means increasing overseas development assistance this year. It means strengthening social safety nets. It means investing in agriculture in developing countries by getting seeds, tools, sustainable agricultural practices and credit to smallholder farmers so they can produce more food and get it to local and regional markets.

Pro-poor policy also means increasing investments in better land use, water conservation and drought-resistant crops to help farmers adapt to a changing climate, which – if not addressed – could usher in chronic hunger and malnutrition across large swaths of the developing world.

Third, we need a robust climate deal in Copenhagen in December. Not next year. This year. The climate negotiations must be dramatically accelerated and given attention at the highest levels, starting today. A successful deal in Copenhagen offers the most potent global stimulus package possible. With a new climate framework in hand, business and governments will finally have the carbon price signal businesses have been clamouring for, one that can unleash a wave of innovation and investment in clean energy. Copenhagen will provide the green light for green growth.This is the basis for a truly sustainable economic recovery that will benefit us and our children's children for decades to come.

For millions of people from Detroit to Delhi these are the worst of times. Families have lost jobs, homes, healthcare and even the prospect of their next meal. With so much at stake, governments must be strategic in their choices. We must not let the urgent undermine the essential. Investing in the green economy is not an optional expense. It is a smart investment for a more equitable, prosperous future.

■ **About the authors:** Ban Ki-moon is UN Secretary-General. Al Gore is former US Vice-President.

Green economy: From Ban Ki-moon to Fuheid al-Sharif

By ***Najib Saab***

This article was originally published in the Daily Star (http://www.dailystar.com.lb)

"Were you the one who wrote that speech?" my son enquired after we listened to the UN Secretary General Ban Ki-moon's graduation speech to the class of 2009 at the Johns Hopkins School of Advanced International Studies in Washington. William, who graduated with a degree in energy and environment policies, was taken by surprise with the high environmental tone of the secretary general, compared to the usually subdued international statements meant to please everybody, while saying nothing.

The global economic crisis is a genuine wake-up call that requires shakeup of the old development patterns, said Ban as he called for a new green deal that invests in clean and renewable energy resources. "By investing in green, we create jobs and spur economic growth. At Copenhagen, we need to unleash green investment and jump-start a lasting economic recovery."

Moreover, the secretary general urged governments, companies and individuals to take effective steps to safeguard the planet: use public transport systems, recycle wastes, plant trees, make companies accountable for their environmentally damaging practices and ask your representatives in government to strike a historic deal in the Copenhagen Climate Change conference.

This candid language that calls for halting sa¬vage development patterns is new to the head of the UN, as until recently it has been confined to staunch environmental groups. But Ban has shown an unprecedented commitment. In fact, the Green Economy Initiative launched by the United Nations Environment Program (UNEP) last year was not destined to such acclaim without the support of the highest authority at the international organization. This initiative appears to have succeeded in turning the economic crises into an environmental blessing, as many countries have allocated a reasonable percentage of their economic incentive packages to green economy programs. Here are a few examples: South Korea, Ban's home country, has allocated 80 percent of economic incentives to green economy, while China allocated 38 percent, the US 25 percent and Germany 12 percent.

Governments are now convinced that allocating resources to green economy is not a luxury, but an option which stimulates growth and creates jobs as well. In the US it is envisaged that a new $100 billion program for energy efficiency in buildings and towns will create two million new job opportunities within four years. On another front, the market for organic agriculture has increased from $15 billion in 1999 to $50 billion in 2008, creating enormous job opportunities, being a labor-intensive activity- an ideal option for unemployed agricultural labor in many parts of the Arab region.

Apart from renewable energy, retro-fitting for energy efficiency, organic and sustainable agriculture, the Arab countries can invest in countless sectors in order to create new job opportunities within a green economy, such as water management and ecotourism. About 50 million citizens in the Arab countries currently lack access to clean drinking water resources and 100 million lack access to water needed for proper sanitation. The World Bank estimates that Arab countries need to invest up to $200 billion until 2020 in water management. Such investments can enhance environmental conditions and create new job opportunities that the Arab countries badly need, knowing that 25 percent of young people below 30 years old and 17 percent of the total workforce are currently unemployed.

The wave of green economy that has started to disperse globally, from the US, to the UK, Korea and China is starting to hit the Arab World. The Arab Forum for Environment and Development (AFED) has finished last month the first series of workshops in seven countries in partnership with UNEP for the launch of the Arab Green Economy Initiative, with the participation of the private sector and public and civil organizations. National committees that emerged within this process will recommend programs to the annual AFED conference in November 2009, paving the way for real action.

Fuheid al-Sharif, governor of Saudi Arabia's General Corporation for Water Desalination, has called for the "nationalization" of desalination technology and its associated equipment: "It is not logical that we own the biggest desalination plant in the world and are the greatest producer of desalinated water, while we are still importing the technology and equipment entirely, at a time when we have all the opportunities and capabilities for locally developing all of those."

This is only one of the many fields of productive investment in green economy, that meets the real needs of the region, while supporting the national economy and creating hundreds of thousands of job opportunities.

The world is changing for the better, governed by the will to survive. As we welcome Ban's statements about green economy, we are more thrilled with the statement of the head of Saudi Desalination Corporation that reflects the spirit of the recommendations from the AFED annual Conference for capacity building in desalination technologies and local production of equipment and spare parts.

Imagine how many million jobs can be created and how many billions of dollars can be gained from the use of the sun in the Arab world to desalinate water or produce hydrogen from sea water and export it pressurized as clean energy.

The US committed for the first time in Bonn last month to reduce carbon dioxide emissions by 17 percent in 2020, compared to 2005 levels. Concurrently, the EU countries have committed to reduce emissions by 20 percent with promises from both sides to increase the ceilings of reduction, if China and India join the system. This approach is an indicator of a complete new phase, ushering a historical deal on climate change in Copenhagen next December.

With US President Barack Obama and Ban, we should be witnessing a new era in international cooperation on climate change not witnessed before. Countries which choose to stay on the sidelines will be left behind.

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THE DAILY STAR

Low-Carbon Economy

A Low-Carbon Economy (LCE) refers to an economy that limits the output of greenhouse gas (GHG) emissions into the biosphere. The objective is first to take into account all GHG emission sources, from the large industrial plant to the private household. There are then three ways to lower GHG emissions: avoid unnecessary GHG emissions, limit necessary emissions, and trap the greenhouse gases that are still emitted (carbon storage).

Avoiding unnecessary emissions can, for example, mean using carbon-efficient transportation (trains and boats instead of planes, cars or trucks) or avoiding overheating or overcooling buildings.

Along the same lines, limiting necessary emissions might involve building more efficient buildings (that require less heating, cooling and lighting) or using more efficient transportation (electric or hybrid cars, more efficient trains or planes).

Resource Efficiency

We are consuming more than nature can regenerate and we are producing waste faster than the earth's systems can process it. A WWF study released in 2008 reinforce the message clearly: human consumption of the earth's resources outstrips the planet's capacity to regenerate by about 30%. As a result of continuing population growth and increasing demand for resources in many parts of the world, this ecological deficit is amplified each year.

Resource efficiency is about ensuring that natural resources are produced, processed and consumed in a more sustainable way, reducing the environmental impact of the consumption and production of goods and services over their full life cycles. By producing greater wellbeing with less material consumption, resource efficiency enhances the way in which human needs are met while respecting the ecological carrying capacity of the earth.

Improved resource efficiency is also essential for achieving the Millennium Development Goals (MDGs). MDG 7, for example, defines the four targets for ensuring environmental sustainability – reversing the loss of environmental resources, reducing biodiversity loss, increasing access to safe drinking water and basic sanitation, and improving the lives of at least 100 million slum dwellers. If these targets are to be reached, greater resource efficiency and more sustainable production and consumption patterns will be required. SCP offers developing countries new opportunities such as the creation of new markets, job generation (for example, markets for organic food, fair trade, sustainable housing, renewable energy) and the improved use of natural resources.

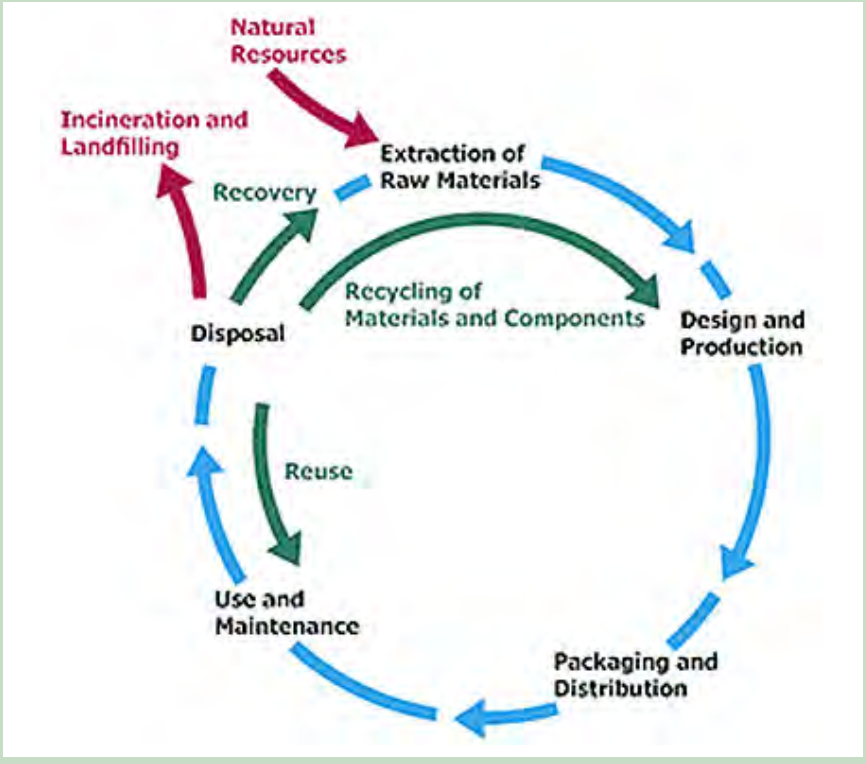
See also: **www.unep.org/resourceefficiency**

Life cycle analysis

Every product has a life cycle. Products are designed, produced, launched, used and maintained, and at some point, may "die" (disposal or recovery).

Life cycle analysis moves beyond the traditional focus on a production site and manufacturing processes to include the environmental, social and economic impact of a product or service system over its entire life cycle, from cradle to grave. This analytical tool helps us to understand how production systems and consumer choices are one part of a whole system of events.

Indeed, a life cycle approach identifies both the opportunities and risks of a product or technology, from the extraction of raw materials to disposal, and can provide relevant information to determine and influence patterns of consumption and production.



Economics for the planet goes one step beyond greening the economy. Debate on the economics of nature is only now beginning, but depending on the direction it takes, we may see new models for business and government accounting emerge, new currencies expressing natural and social assets. We may even see a GDP of the poor. Time will tell. One thing is certain, we are all part of the puzzle.

Putting the global economy on a green path

*By **Fatma Ben Fadhl**, **Moustapha Kamal Gueye** and **Nicholas Bertrand***

Global crises and linkages

The cumulative effect of the financial and economic crisis has been a contraction of economic growth in many parts of the world. Falling growth has quickly translated into decline in incomes and rise in poverty. It is estimated that every 1% fall in growth in developing economies translates into an additional 20 million people consigned to poverty. The United Nations Department of Economic and Social Affairs estimates that world income per capita could drop by 3.7% in 2009. The number of people living on less than $2 a day could rise by some 100 million and those below $1 a day by 40 million. According to the International Labour Organization (ILO), the number of unemployed could rise from 190 million in 2007 to 210 million in late 2009.

As world leaders battle to counter recession and face the triple food, energy and financial crises, longer-term challenges lay ahead: these include climate change, fossil fuel depletion, and ecosystem degradation. Figure 1 shows the cause-to-effect interlinkages between the climate, financial, energy and food crises, which are the rationale for a holistic approach advocated for by the Green Economy Initiative.

The economic crisis is indicative of flaws in patterns of growth and development over the past 50 years that have excessively relied on investment in financial capital without equal attention to investment in human and natural capital. The global Gross Domestic Product (GDP) has doubled between 1981 and 2005 while 60% of the world's ecosystems have been degraded or exploited unsustainably according to the Millennium Assessment Synthesis report released in 2005. This is undermining the basis of livelihoods and wealth creation, particularly affecting the poor and most vulnerable segments of society. In low-income countries, natural capital accounts for up 26% of the wealth, compared to 2% in the richest countries. The imbalance in patterns of investment in economic, human and natural capital represents a challenge for long-term sustainable development and must be given due attention in the global effort to rebuild economies.

These challenges and contradictions will not disappear if economic growth were to resume in a business as usual manner. Once global growth resumes, the price of oil is expected to rise to $180 a barrel. The impact will be felt especially by the poor. In 2008 rising fuel prices cost consumers in developing economies $400 billion in higher energy expenditure and $240 billion in dearer food. The rise in food prices in 2007 is estimated to have already increased global poverty by between 130 million and 155 million people.

Consumers who do have access often pay high prices for erratic and unreliable services. In 2008 the International Energy Agency (IEA) estimates that currently some 2.4 Billion people use unsustainable traditional energy sources in Africa, Asia and Latin America. The expected increase in energy prices will add to global energy poverty.

Furthermore, the IEA's 2008 World Energy Outlook estimates that, with current practices, despite the slowing down of population growth and future economic growth prospects, the number of people without access to electricity in 2030 will still be 1.4 billion. About two-thirds of this number will live in sub-Saharan Africa.

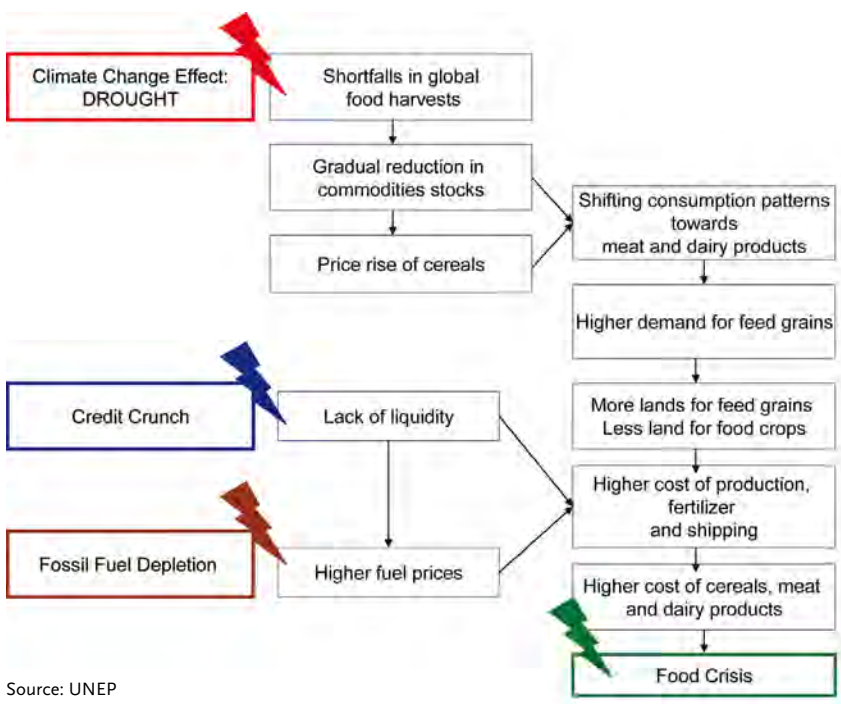
UNEP's call for a Global Green New Deal

In the wake of unprecedented economic stimulus packages a recent UNEP report released in December 2008 called for a Global Green New Deal and a subsequent Policy Brief to G20 heads of states urging them to turn the crisis into an opportunity by enabling a global green economy driven by massive job creation from a more efficient use of resources, energy-efficient building and construction, widespread use of modern clean public transport, the scaling up of renewable energy, sustainable waste management as highly lucrative sectors, and sustainable agriculture that reflects the latest thinking in ecosystem management and biodiversity and water conservation.

The GEI seeks to make the economic case that the right mix of policy actions can stimulate recovery and at the same time improve the sustainability of the world economy. Over the next few years, these policies hold the potential of creating millions of jobs, improving the livelihoods of the world's poor and channel investments into dynamic economic sectors. The "Global Green New Deal" (GGND) as called for by UNEP refers to such a timely mix of polices.

A number of governments are responding to the financial crisis by stimulating their economies through public investment. By April 2009 the G20 nations had announced nearly $3 trillion of fiscal stimulus packages, representing approximately 6% of their total GDP. Twelve of these major economies included "green stimulus" measures for diverse green sectors totalling over $400 billion, among which $183 billion for renewable energy (see figure 2). Green stimuli account for 6% of the total recovery packages announced – but the countries vary significantly in terms of investment and the clarity of their measures.

Figure 1: Interlinkages between the climate, financial, energy and food crises



Source: UNEP

A world economic recovery that revives fossil fuel consumption will accelerate global climate change. Greenhouse gas (GHG) emissions are expected to increase by 45% to 41 gigatonnes (Gt) in 2030, with three-quarters of the rise generated by China, India and the Middle East. The IEA warns that the atmospheric concentration of GHG could double by the end of this century, and lead to an eventual global average temperature increase of up to 6°C. Such a scenario is likely to cause a sea level rise between 0.26 and 0.59 meters, and severely disrupt ecosystem services. According to the Stern Review of the Economics of Climate Change, with 5-6°C warming, the world economy could sustain losses equivalent to 5-10% of global GDP. Poor countries will suffer costs in excess of 10% of GDP. Reports by the IPCC indicate that by 2020, rain-fed agricultural production in several sub-Saharan African countries could decline by over 50%. Changes in agricultural productivity will not only hit GDP growth expectations, but also exacerbate many of the agricultural and food security challenges already facing the world's poorest countries. In 2007 the OECD note that across all cities worldwide, about 40 million people are exposed to a 1 in 100 year extreme coastal flooding event, and by the 2070s, the population exposed could rise to 150 million.

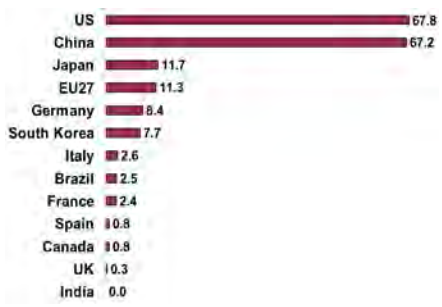
Investing in green sectors

Responding to these challenges requires transformative change in the way resources are allocated in the economy. There is growing indication that investment in the so-called green sectors could offer solutions to the myriad of environmental, economic and social challenges of today. During 2008, the United Nations Environment Programme (UNEP), the International Labour Organization (ILO), the International Organisation of Employers (IOE), and the International Trade Union Confederation (ITUC) jointly commissioned "Green Jobs: Towards Decent Work in a Sustainable, Low-Carbon World" which is the first comprehensive report on the emergence of a "green economy" and its impact on the world of work in the 21st Century.

The report showed that employment will be affected in at least four ways as the economy is oriented toward greater sustainability:

- Additional jobs will be created – as in the manufacturing of pollution-control devices added to existing production equipment.
- Some employment will be substituted – as in shifting from fossil fuels to renewables (see figure 3), or from truck manufacturing to rail car manufacturing, or from land filling and waste incineration to recycling.
- Certain jobs may be eliminated without direct replacement – as when packaging materials are discouraged or banned and their production is discontinued.
- Many existing jobs (especially such as plumbers, electricians, metalworkers, and construction workers) will simply be transformed and redefined as day-to-day skill sets, work methods, and profiles are greened.

Figure 2: Green Stimulus allocations to clean energy by Country ($bn)s



Total amount announced by the 12 economies amounts to $183.4bn. Source: New Energy Finance.

Table 1: Estimated employment in the renewable energy sector

Technology	Global (2006)
Wind	300,000
Solar	170,000
Solar Thermal	624,000
Biomass	1,174,000
Hydropower	39,000
Geothermal	25,000
Renewables combined	2,332,000

Source: UNEP/ILO/WorldWatch Institute

Building on these findings, the UNEP -led Green Economy Report due to be released at the end of 2010 aims at proving that sustainability in high impact sectors of the economy offer green opportunities for economic growth in the future as sustainable investments in these sectors can contribute to rapid economic recovery in the short term and sustained economic growth over the next few decades with positive contributions to decent job creation and poverty reduction.

Conclusion

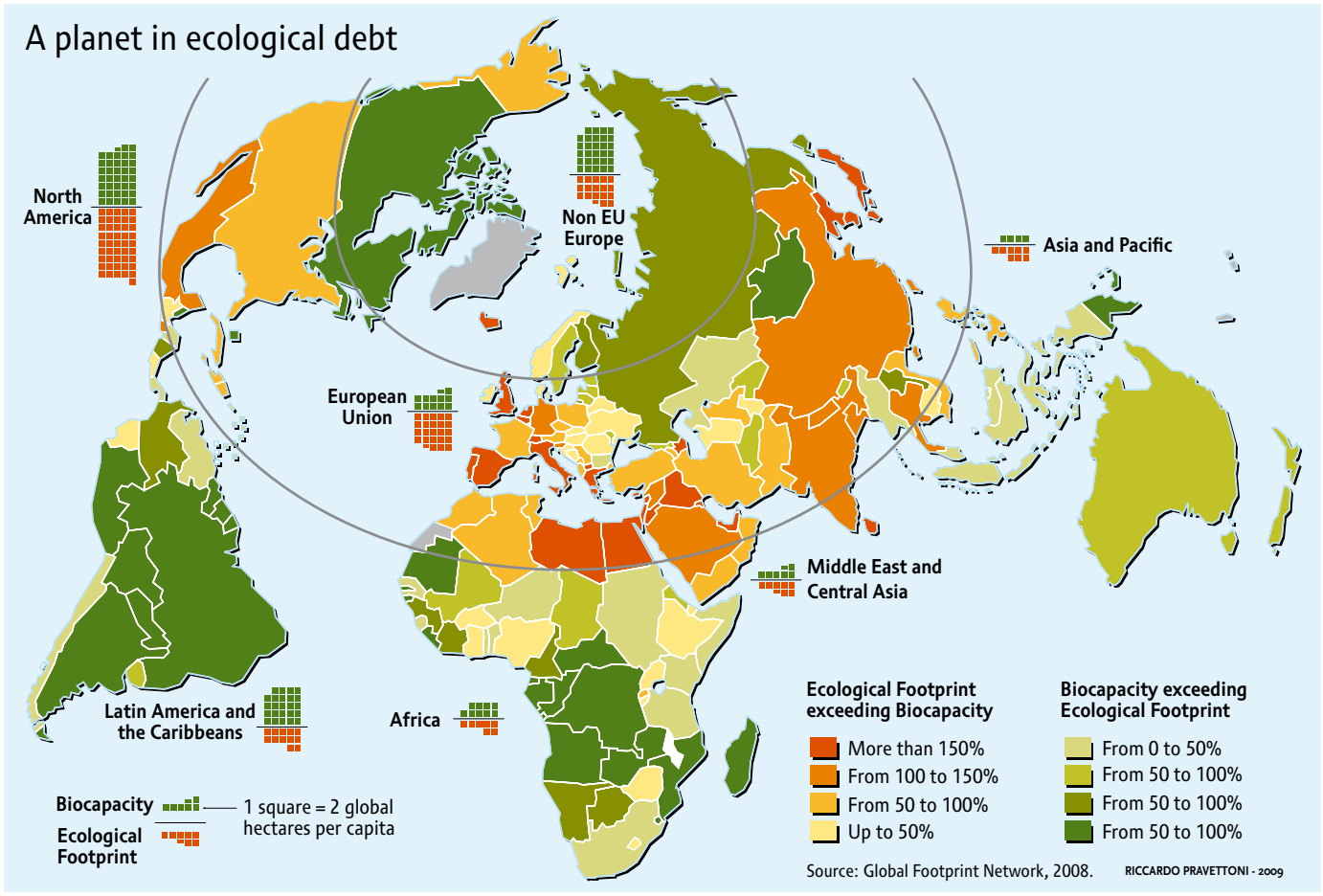
Throughout history, crises have always been times of quick and bold action. They have also offered opportunities for transformative change in society and their economies. The multiple food, energy, ecological, financial and economic challenges witnessed in recent years should be seized as a major opportunity to reorient investment and financing in a new set of economic, natural and human assets that can drive recovery and prosperity and address poverty over the long run by laying the foundation of a global transition towards a green economy.

Through the GEI, UNEP is committed to work with governments, civil society and the private sector to identify the most promising streams for enabling a green economy. For instance, the Green Economy Report (GER), a key component of the Initiative, will seek to make a macroeconomic case for increasing public and private investments in 12 "green sectors" (the 12 sectors are as follows: cities, buildings, finance, renewable energy, transport, waste management, industry, tourism, water, agriculture, forests and fisheries). The report's main objective is to motivate and enable policymakers, business executives, and stakeholders to invest in green sectors, to be supported by necessary policy and institutional reforms.

UNEP will also assist with the reviewing of national or regional green policy initiatives to provide guidance to other countries, UNEP will also define and assess promising financial instruments that will facilitate and secure investments in green sectors.

■ **About the authors:** Fatma Ben Fadhl, Moustapha Kamal Gueye (PhD) and Nick Bertrand are Economics Affairs Officers at UNEP working on the Green Economy Initiative.

Ecological creditors and debtors



*By **Mathis Wackernagel***

A version of this article first appeared in the Commonwealth Ministers Reference Book 2009

We are all familiar with the concept of creditor countries, that is, countries that extend financial resources to regions far outside their borders. But there is another type of creditor nation that underwrites the economies and livelihoods of distant shores. So-called ecological creditors are countries that have more biocapacity (ability of their ecosystems to produce resources) than they use for their own benefit. By providing ecological services – ranging from exporting resources in the form of wood products, for example, to removing CO_2 from the atmosphere – they provide many ecological services the rest of the world's countries rely upon.

More than three-quarters of the world's population now lives in countries that are ecological debtors – they use more resources and ecological services than the ecosystems within their borders produce. This has changed drastically since just five decades ago, when the vast majority of the world's people lived in countries with ecological reserves. As the number of ecological creditor nations dwindles, the resource pressures on those remaining surpluses increase and a clear challenge emerges: not everyone can be a net importer of resources. Much of Latin America, as well as New Zealand, Canada, Gabon, Finland, Botswana, Australia and others, are still in an ecological creditor situation, which might significantly – and positively – affect their future economic standing and competitiveness, if resources are managed well. Conversely, those ecological debtor countries that are preparing themselves for resource constraints will be far better equipped to navigate the future. Recognizing this new geopolitical shift can help put the climate negotiations on a much more productive path.

This is why: ecological debtor countries depend on the health of ecological assets in creditor countries. It is very much in their interest both to become less dependent on such assets, and to support creditor countries in managing those assets carefully.

Through our Ecological Creditor and Debtor Initiative, Global Footprint Network is convening key policy experts and decision-makers to initiate a dialogue on the growing significance of biocapacity for economic prosperity and stability. If we succeed, policy-makers will start to recognize both the tangible benefits of maintaining ecological assets and the risk that liquidating these assets poses to their nations' long-term interests.

Avoiding the impending resource crunch

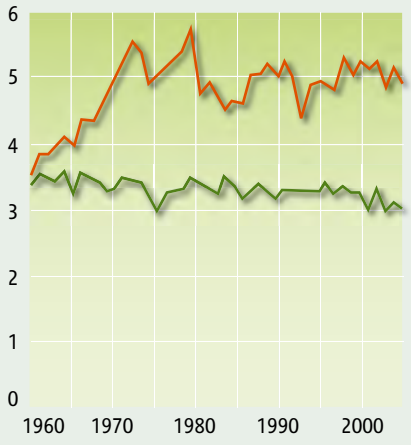
The shift of many nations from being ecological creditors four or five decades ago to ecological debtors today is part of a larger global trend. In the early 1960s, humanity consumed only about half of what planet Earth could provide. In the mid-1980s, humanity began to demand resources and ecological services faster than the earth could renew them, a condition known as ecological overshoot. Since then, growing human population and per capita resource consumption have caused overshoot to escalate. Our accounts conclude that in 2005, the most recent year for which data are available, human demand exceeded by 30% what the earth could renew.

The symptoms of overshoot are clear and pressing: rapid climate change, crop shortages, biodiversity loss, freshwater stress, shrinking forests and depleted fisheries. Yet, so far, global negotiations around environmental crises have been mired in dragged-out debates and deadlock, with no significant moves toward implementation. Most political leaders see little strategic upside to bold action and aggressive policy. The path to reaching global agreements (such as the emerging Copenhagen agreement on climate change) has been extremely fragile; now with the world's shaky economic situation, there is an especially high likelihood of monkey-wrenching.

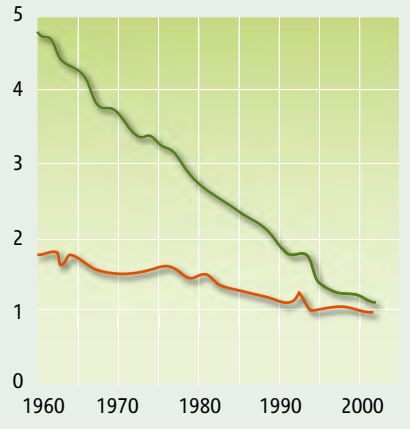
Incorporating a creditor/debtor view of the world into the discussion brings an invigorating element of national and regional self-interest. Creditor countries have the economic, political and strategic motive for preserving their ecological assets, while debtors have a direct interest in reducing their exposure by minimizing their resource dependence.

In recognizing that humanity is moving at great speed into resource constraints, and that reinventing our urban infrastructure so it can cope with these constraints takes time – possibly several decades – it becomes clear that there is no advantage in waiting. While collective agreements will certainly accelerate action, delaying action incurs a growing cost and risk.

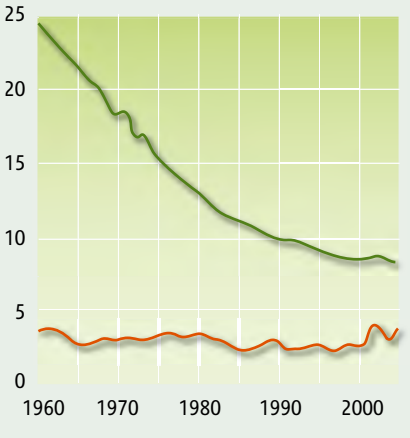
World Ecological Footprint and Biocapacity, 1961-2005



Tanzania Ecological Footprint and Biocapacity, 1961-2005



Botswana Ecological Footprint and Biocapacity, 1961-2005



As ecological reserves become increasingly rare, it will become critical for creditor and debtor nations to forge new relationships and move toward policies that protect natural assets while improving health and well-being. In this game, everyone can win. Every single person will benefit from early action.

The challenge for creditors and debtors

It is now generally accepted that running a trade deficit involves risks, but the same is not true of ecological deficits. Consider the United Kingdom. In 1961, it was one of only a handful of countries in the world where the population's demands on nature exceeded the country's biocapacity. At that time, it used nearly twice what its ecosystems could renew. In the last four and a half decades, however, that spread has nearly doubled. The UK now demands resources of more than three times its biocapacity – and at the same time, the number of countries with ecological reserves able to provide the ecological services it needs is shrinking rapidly.

As for ecological creditors, the future doesn't give them an advantage if they don't prepare well and avoid the pitfalls. Tanzania and Botswana are still creditors, but their ecological remainder is shrinking rapidly. Climate change, expanding population and other factors are increasing the pressure on each country's ecological assets. Without such a remainder, it will be more difficult for those countries to succeed in the global economy, particularly as it will become increasingly difficult in a world with global overshoot to access ecological services from abroad.

The Ecological Creditor Initiative will help countries think through these various challenges and develop strategies that recognize nature as a core asset. In the long term, these discussions could shift the way we value and negotiate resources in the 21st century, providing clear strategic and economic advantages for nations to become more resource-efficient and bolster their ecological reserves.

In April, Global Footprint Network met with policy experts and government representatives in Lima, Peru, to kick off the initiative and begin a series of workshops on the growing significance of biocapacity and its potential for competitive advantage in a resource-constrained world. The organization will continue to hold meetings and convene international work sessions throughout the year, including hosting a side-event at Copenhagen. Next year, Global Footprint Network plans to present a summary of the work session findings at a wide range of international forums and conferences, leading up to a Presidential Gathering on Biocapacity in late 2010.

Once leaders begin to understand the inherent value of ecological assets, the paradigm will shift from "the more we reduce resource consumption and waste emission, the more difficult it is for us to be competitive" to "the more we reduce resource consumption, the greater our well-being and the lower our risk."

It changes the equation from a negative sum game, where financial wealth is generated at the expense of the environment, to a positive sum game, where the economic objective becomes securing the best lives using the fewest resources.

■ **About the author:** Mathis Wackernagel, Ph.D., is founder and Executive Director of Global Footprint Network. For more information on the Ecological Creditor and Debtor Initiative, go to www.footprintnetwork.org/creditors.

The economics of nature

By **Håkon F. Høydal**, **Anne Solgaard** and **Hedda L. Bredvold**

Based on an interview with Mr Pavan Sukhdev, study leader for the project on The Economics of Ecosystems and Biodiversity and the UNEP Green Economy Initiative

"Most of what nature provides us is free. It does not go through a market economy. That is why it tends to get ignored," says Pavan Sukhdev. The Indian economist aims to include the natural environment in our economic calculations.

Pavan Sukhdev is the leader of the TEEB project – The Economics of Ecosystems and Biodiversity – which was launched at the G8+5 Environment Ministers' meeting in Germany in March 2007. If he achieves what he is working for, we might in a few years see a different economy, which includes the pricing of what nature gives us. "Even if nature may seem to give it for free, that is no reason not to include its value when measuring our economy," Sukhdev tells Environment and Poverty Times.

– In nature, you can appear to have a free lunch once in a while, but not continuously. We are focusing too much on what human beings produce, and are missing the extent to which nature creates and human beings use up those created resources. We give priority to the market economy: to manufacturing, industrial processing and to the service sector, because these generate profits for corporations and taxes for governments. What we are missing is the importance of nature when it comes to providing climate stability, free flows of clean air and fresh water and biodiversity. Services like flood prevention and carbon sequestration are certainly not paid for. They are services provided free by nature that do not go through a market economy. And so they tend to get ignored in our modern world.

– This is what TEEB wants to change. The project was started by the G8+5 conference in 2007 in an effort to try and merge the two ecos: ecology and economy. The traditional way of approaching and applying economics is too narrow, and misses a lot of the equation, Sukhdev explains.

– Industrial processes are only the fag end of the overall process. Even if you make food, it is not the harvesting and the processing that are central in the production. It is the production and selection of the seeds, their cultivation, the growing of the food, the fertility of the soil, the cycling of nutrients, and the access to the use of fresh water resources. There is a lot of production in nature that goes into everything we consume. But traditionally we only look at the element of production that is manufactured by man. Because of that limitation in our thinking we tend to take actions that are not good for the survival of the economy and humanity, Sukhdev says. What TEEB tries to do is to convert all this into numbers.

– We try to calculate how much it is worth to have these nature-given services. What is the value of biodiversity? How much is it worth? What are the costs of the alternatives? How much will it cost not to have fresh water, to replace it with artificial irrigation? Which costs would be incurred by the economy to provide the alternative? All this adds up to us working out the economics of nature's losses.

– How is it possible to translate the multiplicity of our ecosystem into numbers?

– It's not. Nature itself is everything. All we can calculate in economic terms is the value of the services we receive. We cannot value nature itself. If we want to value nature, the answer is very simple: it's infinitely valuable. With it we can survive, and without it we cannot. The difference between survival and non-survival is one divided by zero, and the answer to that is infinity. I don't need a project to calculate the value of nature. I need a project to work out the value of ecosystem services and biodiversity benefits to the economy.

– Nature in numbers. How do you want to use these ecosystem spreadsheets?

– We must make politicians and businesses understand what they are missing when they think they can run the economy without paying attention to these values. That is what the project is about. We in TEEB are trying to prove that without these values you wouldn't have the economy we have today.

– Can you give us an example of how this is already implemented today?

– Yes, I can. In Costa Rica, for example, the government has decided to charge a tax on transportation by private cars through fuel tax. The income from this is used for payments of environmental services. The government identifies farmers who have patches of forest on their farms, and they reward them for conserving these. The government pays for four values of the forest: carbon, water, the landscape and biodiversity. If the forest has some of these values, the farmers are rewarded. So far, they have identified 10,000 farmers to whom these payments are made. It has become so big it has become part of the environmental policy of Costa Rica. The logic is that you have to have a reward, and the reward has to be material, otherwise people will not change. You can object that the money is only going to the rich farmers, because only rich farmers have large farms with forests. But because of this, the overall fertility of the soil will improve, so poor farmers are also benefitting from this.

Pavan Sukhdev, Lead Author, 'The Economics of Ecosystems and Biodiversity' on the "To be honest, the economic consequences (from human consumption of natural resources) are huge" - *http://www.youtube.com/watch?v=7JwaYCRyDII*

Pavan Sukhdev hopes a similar system soon will be applied to his home country India. In neighbouring Nepal, over 80% of the energy comes from fuel wood. People are constantly chopping wood. This forest degradation has a serious effect on flooding in Bihar, an Indian state south of Nepal and as a result, the flood and mud flows down the Nepalese hills to Bihar get worse every year. These floods cost Bihar a third of their GDP. Therefore it makes sense for Bihar to pay Nepal for protecting the forests in Nepal. It is not happening yet, but this is one of the international payments for ecosystem services which need to be worked out.

– The basic problem is that nature gives us all this for free. Why should producers or any of us be interested in giving value to resources and services for which consumers do not have to pay? If that resource was taken away, the cost of replacing it would be high. Take coal for example. It has taken several hundred million years with heat and very high pressure to produce the coal which we mine. Try to estimate the value of that, imagine how much it would cost to replace that process, to recreate coal. It's massive.

As a trained economist and devoted ecologist, it is easy for Mr Sukhdev to talk about nature in economic terms. He argues that we need to buy assurance from nature, to safeguard us from a loss we cannot afford.

– The risk comes in two ways. There is the risk of running out of resources. The other is the climate risk: you burn fossil fuels, the company which sells it doesn't pay for the resource, but only the cost of extracting it, nor does the individual who uses it pay for it. In the end we shall all pay for it by not having a world for our children. So you need to value this risk. In finance we always value risk. We pay premium for risk. But nature does not charge you a premium. Nature is no financial institution. It is not charging a premium for the assurance of providing its services next year and the year after. You're assuming it, for there is no charge.

Pavan pauses briefly before he continues, making exclamation marks by thumping his finger on the table:

– Right now, there is no assurance! Nobody is paying their premium. No one is putting up the pressure to bring about real changes in consumption patterns, or political, economic or social structures for that matter. Governments are more focused on ensuring employment, and will ensure that they meet the needs of the people in the short term. And corporations are not interested in controlling their externalities. A corporation is targeted at making a profit. So we have a fundamental problem.

He is, however, optimistic.

– Change is gradual. You cannot have a vision for the future without a plan for getting there. But nowadays, people do not have a vision for a low-carbon economy. Gradually the vision is coming, but we are struggling to find out how to get there. Transition is always difficult, but it has to be done. It cannot just be GDP growth that drives everything.

– Regarding that, you are known for having calculated a GDP of the poor. What does that mean?

– The whole world is as dependent upon nature as the poor are, but the result of the loss of nature is more immediate for them. For the rich, biodiversity is perceived as a luxury. For the poor, it is part of their daily survival. What they get from nature is vital. They get fuel wood, fresh water, free honey, leaves for the cattle, building materials, to mention a few gifts of nature. Their livelihoods depend heavily on these things that are harvested free. We did the calculation in India: If you take the ecosystem services not accounted for, it was only 7% of the national GDP. But if you look at to whom these benefits go, the answer was almost 60% of the GDP for the poor comes free from nature. So if you lose biodiversity you are condemning the poor to eternal poverty. There is a deep and economically proven link between what comes from nature, and poverty. Development has to happen by ensuring that those flows continue, and then by providing extra, like education and health and new livelihoods. You can't say to a poor person "so you've lost your forest, but you now have a hospital and a school!" What is he going to do? He can't eat the hospital, he can't feed the cattle with the school. We can't have development that looks only on building of schools and so on. You have to build livelihood, and respect existing livelihoods of the poor.

This is why he is pessimistic about our achieving the Millennium Development Goals.

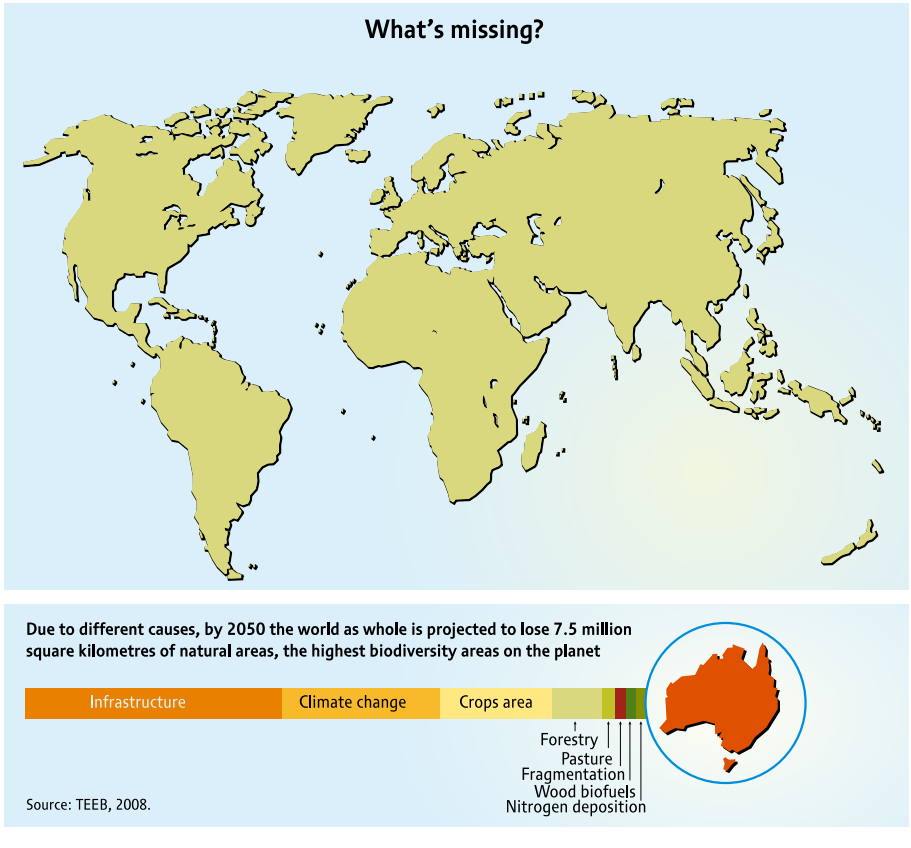
– They cannot be successful because people do not understand the connection between having a healthy environment and achieving these goals. You can't solve health problems just by building hospitals. You have to look at what the people eat, how they live, what is the impact of a healthy environment on them?

No budget ends with a total of infinity. Mr Sukhdev is convinced this is also the case for the budget of nature's services and resources provided to man. It is finite.

– You can't have sustainability if you are eating capital. Today we are consuming our natural capital. The Global Footprint Network has compared the bio capacity in many countries to what they consume. The global average is 1.35 – we are consuming 35% more than the Earth's bio capacity. That is not a good idea. It is like living in a house and say "I need a fire, so I'll chop up this window. I need some clothes, so I'll rip off the carpet." You have to live on the flows from nature.

Right now, the rich world consumes at a rate that would require 3 to 4 earths to sustain it. That does not worry Mr Sukhdev. Yet.

– Right now, the rich world is so small it does not seem to matter. But if the developing world becomes richer, and follows the same pattern of development, we will be in even more trouble than we are today. That is also the part of the problem for the Copenhagen meeting in De-



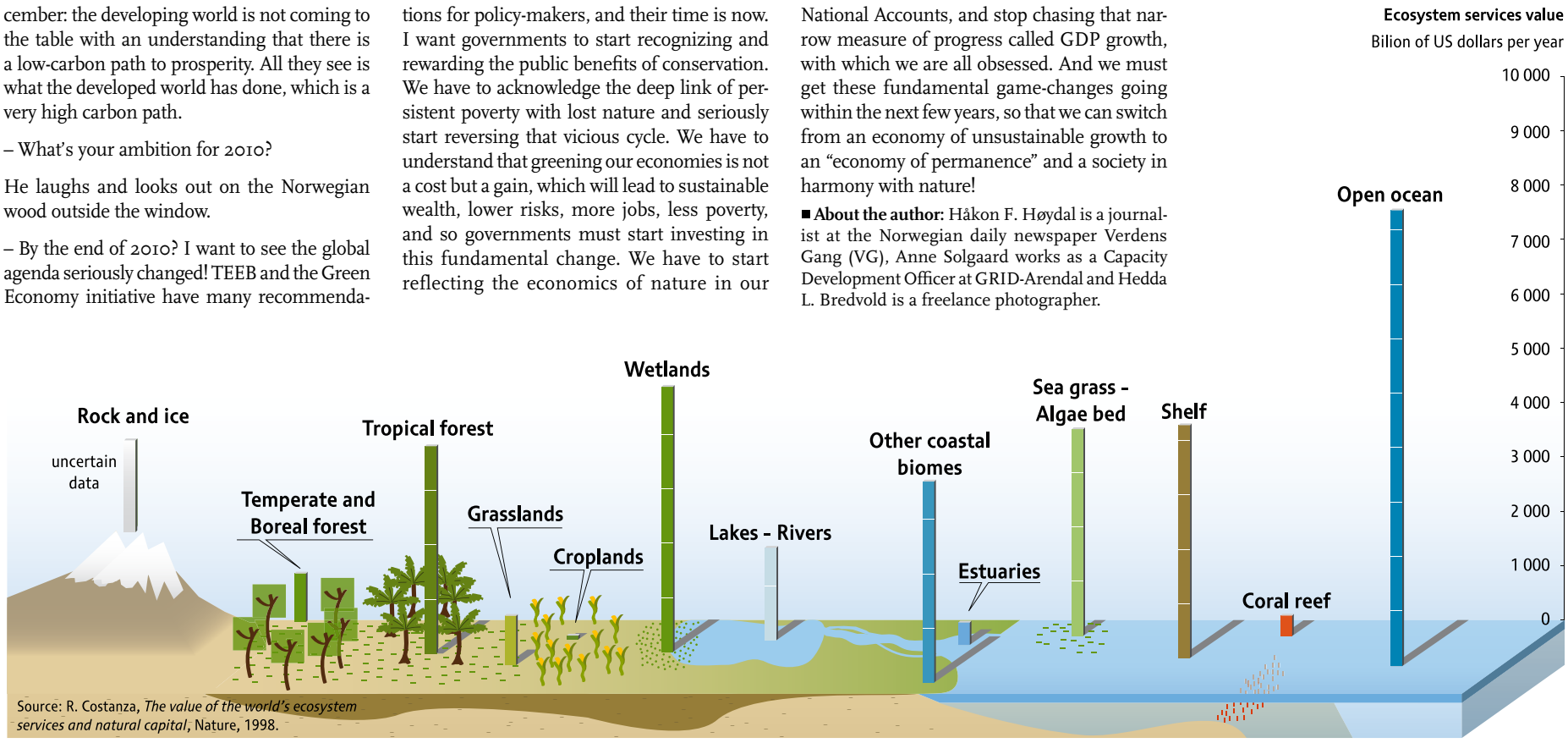
cember: the developing world is not coming to the table with an understanding that there is a low-carbon path to prosperity. All they see is what the developed world has done, which is a very high carbon path.

– What's your ambition for 2010?

He laughs and looks out on the Norwegian wood outside the window.

– By the end of 2010? I want to see the global agenda seriously changed! TEEB and the Green Economy initiative have many recommendations for policy-makers, and their time is now. I want governments to start recognizing and rewarding the public benefits of conservation. We have to acknowledge the deep link of persistent poverty with lost nature and seriously start reversing that vicious cycle. We have to understand that greening our economies is not a cost but a gain, which will lead to sustainable wealth, lower risks, more jobs, less poverty, and so governments must start investing in this fundamental change. We have to start reflecting the economics of nature in our National Accounts, and stop chasing that narrow measure of progress called GDP growth, with which we are all obsessed. And we must get these fundamental game-changes going within the next few years, so that we can switch from an economy of unsustainable growth to an "economy of permanence" and a society in harmony with nature!

■ **About the author:** Håkon F. Høydal is a journalist at the Norwegian daily newspaper Verdens Gang (VG), Anne Solgaard works as a Capacity Development Officer at GRID-Arendal and Hedda L. Bredvold is a freelance photographer.



Economics for People and Planet

*By **Tony Juniper***

Ask a representative group of people what is the greatest threat facing humankind in the 21st century and many suggestions will follow. Terrorism, hunger and poverty will be there, so might a violent superpower confrontation, and disease epidemics will likely be among them. A few people would say that our approach to economics should be at the top of the list. While all the others are real threats, the evidence increasingly suggests that this last one is most likely the correct answer.

The reason is simple. For all its sophistications, mainstream neo-classical economics does not account the needs of, and the impacts of development on, nature. In fact, nature is set to be the ultimate limiting factor on human progress, welfare and fulfilment as we head toward the middle decades of this century. The developed world's consumption patterns take little account of constraints that could in the not too distant future create grave dangers for human societies. At the same time, many environmental problems are not limited by country borders, and often poor communities in the developing world have to bear the greatest burden of impacts.

The scale of the oversight almost couldn't be bigger. One widely cited study by the ecological economist Robert Costanza and his colleagues published in 1998 gave an indication of just how big. He and his co-authors set out to estimate the financial cost of replacing all the services provided to us by nature. Pollination of crops, restoration of soil fertility, recycling of wastes, the coastal protection provided by coral reefs and mangroves, the creation of rain by natural forests and the climatic stability that enables human societies to develop were estimated to be about double the value of global GDP in that year.

In other words this study suggested that the part of the economy that we seek to grow and which is at the core of the political ambition of countries worldwide is actually worth only about half as much as the part that we do not measure, and which is apparently provided for free by nature.

We know now that those free services have been taken far too much for granted. Climate change is the most prominent issue in terms of media coverage and political attention. However, it is unfortunately not the only ecological concern that should be high on our list. The depletion of so-called ecosystem services, ranging from deforestation to overfishing and from soil erosion to the reduced availability of freshwater, is already an economic concern in many parts of the world. So is the depletion of some non-renewable resources, such as conventional oil reserves.

While for many the relationship between economic and ecological conditions might seem like an academic discussion, there is every reason to believe that it is rapidly becoming a practical question of the most pressing kind. For while we treat nature as an endlessly available and largely free service, it is fast dawning that on both counts these are dangerously flawed assumptions. While GDP has continued to grow, nature has been progressively depleted, and this decline in free eco-services will increasingly limit GDP growth.

The main findings of the Millennium Ecosystem Assessment, for example, set out in 2005 how it will be very difficult to meet official poverty reduction targets if the degradation of ecosystems continues unabated. Similar conclusions have been reached in relation to climate change. If we change our approach toward economics, and our expectations as to what constitutes a good life, we might still avoid an ecological crash later this century.

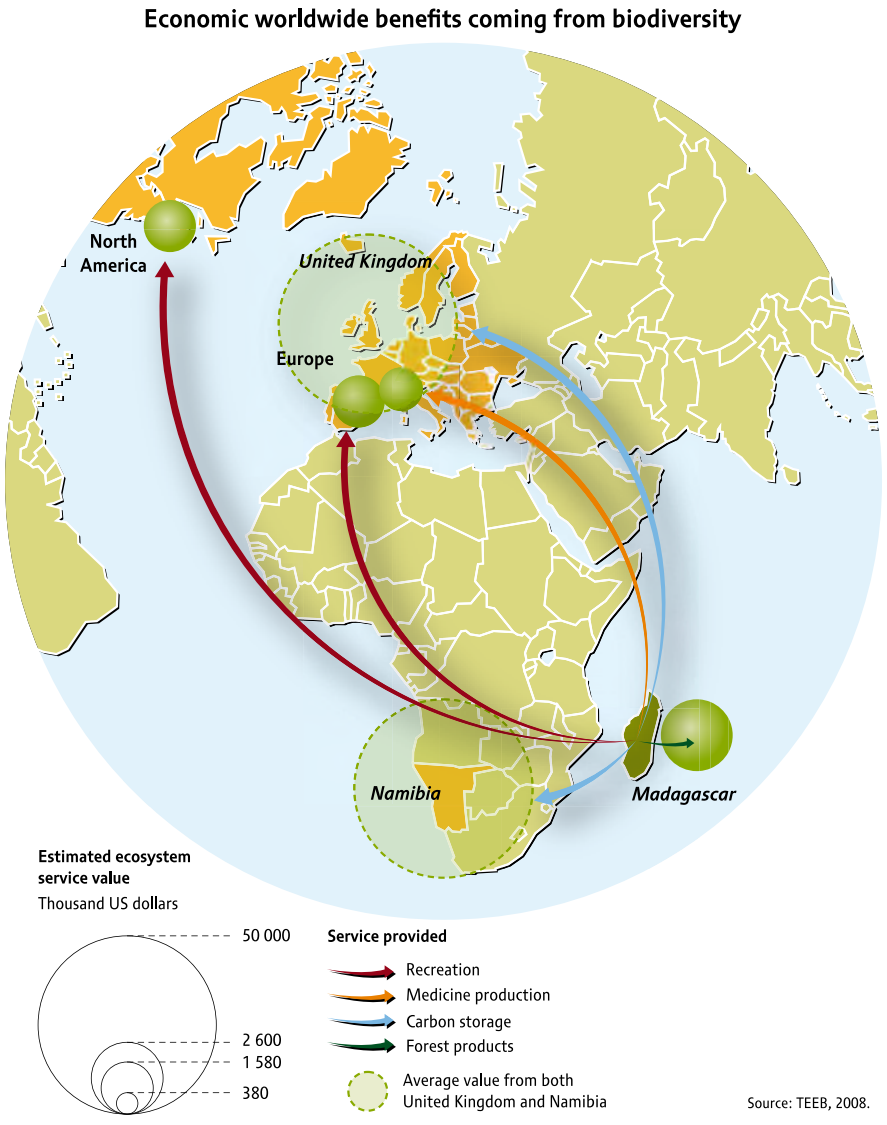
The economic crisis that we are living through right now might be just the opportunity we need to make the transition needed for people and planet. The question is, can we seize the moment, or will the temptation be to return to the 'business as usual' from before the crisis?

Clearly the possibilities are considerable. Equipping the world with the low carbon technologies needed to cut emissions to the level that will avoid the worst impacts of climate change is perhaps the biggest business opportunity in history. Clean vehicles, super efficient appliances, renewable power systems and smart grids could transform the impact of how we live – if only the measures are put in place to ensure these technologies are deployed quickly – and to those in most need of development first. Similarly with the potential for resource efficient manufacturing and genuinely sustainable farming – the opportunity is there, if we wish to take it. Financial transfers from rich to developing countries via innovative new financial mechanisms could help developing countries to keep their remaining forests, cutting emissions and conserving the vast biological wealth held in these ecosystems, while at the same time enabling sustainable poverty reduction.

The transformation to a green economy could create millions of jobs, generate new markets, stimulate new technologies and provide the opportunities for dynamic new businesses, and in the process yield massive social and economic benefits while at the same time conserving the natural systems upon which we all depend. New measures of economic development that consider human wellbeing rather than simply consumption levels, while simultaneously accounting for the state of nature's capital, are needed. If we pursue different economic priorities with different measures, then perhaps sustainable development can still become a reality.

While such a transformation until recently sounded like a utopian dream, it increasingly sounds like our only option to avoid a humanitarian and ecological catastrophe. The moment has certainly arrived to harness economics for people and the planet – the question is; how will we do it?

■ **About the author:** Tony Juniper is an independent campaigner for sustainable living. Special adviser to the Prince of Wales Rainforests Project and a Senior Associate with the Cambridge University Programme for Sustainability Leadership.



Business opportunities and new green jobs are the life blood of a more sustainable future. New opportunities are shaped by drivers such as changing consumer tastes and preferences, government regulations and innovation. This may also lead to more meaningful new jobs for individuals all over the planet.

Growing the wealth of the poor for a green economy

By ***Lauren Withey***

Three-quarters of the world's poorest citizens – those living on less than $2 per day – are directly dependent on natural resources for a significant part of their daily livelihoods. Yet the sustainability of such resources and the rural poor's access to them is frequently under threat from more powerful forces. Artisanal fishermen are losing their catch to large trawlers, forest-dwellers are losing their homes to timber companies, and rural water supplies are being diverted to urban areas and large-scale commodity farming. Climate change, meanwhile, is altering natural resource patterns around the world.

Without secure access to the natural resources upon which they have traditionally relied, the rural poor look elsewhere to create livelihoods. This leads to relocation and accompanying social strife, as well as less sustainable resource stewardship – if a farmer believes the land he is farming will only be his for one or two cropping seasons, he is likely to farm it differently than if he were confident that he would have access to the land for a decade.

Yet where the rural poor are offered secure and long-term access to natural resources, they are often able to build enterprises that create economic, social, and environmental resilience. The steps to fostering such resilience are also steps along the path out of poverty. These findings, which emerge from the World Resources Report, Roots of Resilience: Growing the Wealth of the Poor, are more important than ever within the current global downturn – building greener, more resilient, and more inclusive societies is the only road to lasting economic recovery.

Setting the context

The focus of Roots of Resilience emerged from a growing awareness that a number of troubling features of our global community are tightly intertwined – and that addressing them will require equally integrated solutions. These features include:

- The world is wealthier, but wealth tends to be highly concentrated in a small percentage of the population.
- The Millennium Ecosystem Assessment of 2005 found that 15 out the 24 major ecosystem services it assessed are being degraded or used unsustainably.
- We are already experiencing the consequences of climate change; the pace of these early changes, such as polar ice melt, is more rapid than any models had predicted.
- We have made commendable progress in reducing the number of people living in poverty; but that achievement has been limited to China and a handful of South Asia countries. The plain fact is that almost half the world's population – 2.6 billion people – continues to live on $2 per day or less; one billion of them on $1 per day or less.
- In spite of becoming a predominately urban world in 2007, three-quarters of the poorest families still live in rural areas.
- High population growth rates in rural areas and the return of unemployed urban dwellers back to the countryside is driving these numbers up. These rural-dwellers depend in large measure directly on natural resources for their existence.

These five features of our global society are tightly connected. For example, wood usage and meat consumption has risen rapidly in wealthier countries and fast-growing states like China and India in recent years. This has increased pressure on forest resources in developing states, pushing the poor off their former land. Higher logging rates and burning of the forest for agriculture and cattle ranching contributes to the degradation of forest ecosystems and to climate change. Given the interconnectedness of these issues, any attempt to address one of them must also address their links.

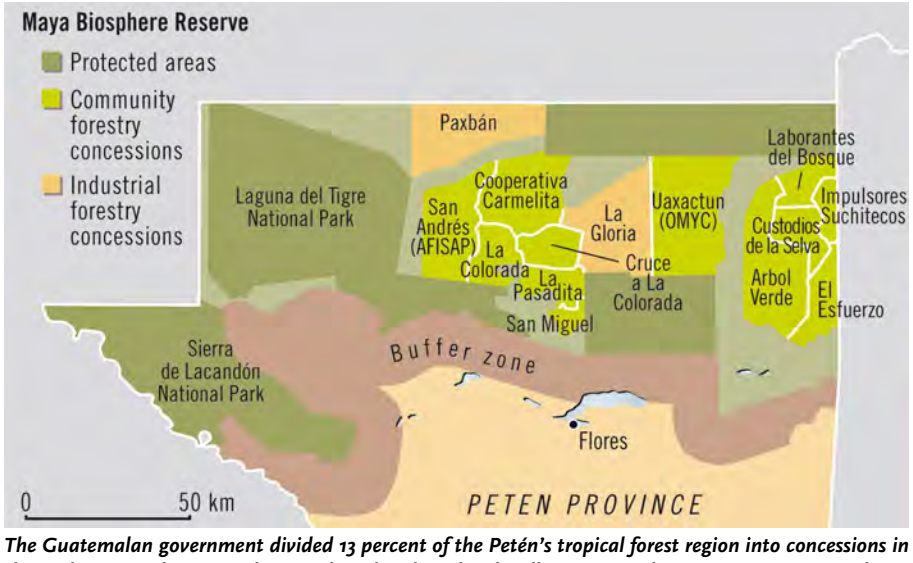
Roots of Resilience identifies an intersection point at which all five of these features can be addressed: ecosystem-based enterprise development. The book contends that the scaling up of ecosystem-based enterprises, such as fishermen's or coffee cooperatives, increases rural resilience, reinforcing the ecological foundations of the rural resource base and providing communities with a stepping-stone along a pathway out of poverty.

Households across the developing world depend directly upon natural resources for daily sustenance and livelihoods. Degradation of these resources forces women and children to walk long distances each day – sometimes more than 20 miles – just to find fuel wood and water for their families. *John Talbott, World Resources Institute, 2007.*

Ecosystem-based enterprises and a green economy

In the year since Roots of Resilience was first published, the global economic downturn has sparked an increasing awareness of the unsustainable nature of the global growth model. Though it was tempting to think that the strong growth trend of the past might last indefinitely, such optimism has been grounded in inaccurate valuations of assets, including natural resources.

Any accurate valuation of these resources should take into account the wide-ranging contributions they make to society beyond their immediate economic value in the marketplace. For example, the contribution that trees make to preventing soil erosion is almost never fully reflected in timber prices – yet erosion control is a valuable ecosystem service that improves water retention and soil fertility, and lowers harmful sedimentation in waterways. Such pricing inaccuracies drive global markets toward overexploiting natural resources and result in economic outcomes such as the commodity price spikes of 2008. The populations that depend directly upon these resources suffer the most as a result.



The Guatemalan government divided 13 percent of the Petén's tropical forest region into concessions in the mid- 1990s. These parcels were then distributed to legally constituted community groups under 25 year leases. NGOs and development organizations worked with these community groups to help them to sustainably manage and derive value from the forest. *World Resources Institute, 2008.*

As part of the recognition of the need to green the global economy, important tools are being developed and implemented that help to internalize the environmental and social values of our natural resources – a global carbon market is one example.

But we need not wait for markets to perfect natural resource pricing in order to move toward a more sustainable and inclusive economy. Roots of Resilience highlights one step we can take right now in this direction, by promoting rural ecosystem-based enterprises.

The case studies of ecosystem enterprises that form the empirical foundation for Roots of Resilience indicate that any success in overcoming poverty takes time and persistence (see Box 1: Forestry in Guatemala). The factors that go into this success – including a wide range of governance variables – are complex and interrelated. Roots of Resilience identifies those elements without which any promise of sustained growth is greatly diminished, focusing on three in particular: community ownership and self-interest; intermediate organizations that foster rural skills and capacity; and networks that support rural producers and provide learning structures. With these factors present, resourceful and resilient communities can emerge.

Community ownership and self-interest

Ensuring that communities have self-interest in stewarding the land around them is a fundamental part of securing benefits for communities from their natural resources. While rural "ownership" rarely implies that individuals have the full bundle of rights typically associated with property ownership, it does mean that they have secure access to a particular resource for an extended period of time. Only by feeling that their access is secure will individuals be willing to invest in the long-term sustainability of their resource.

True ownership, as defined in Roots of Resilience, also involves not only a granting of rights but also a commitment by the community or a subset thereof to maintaining the resource. In a watershed management project, for example, individuals may make this commitment in the form of providing labour to build watershed management infrastructure, or sacrifices of personal water consumption for the benefit of the full community.

Intermediate organizations

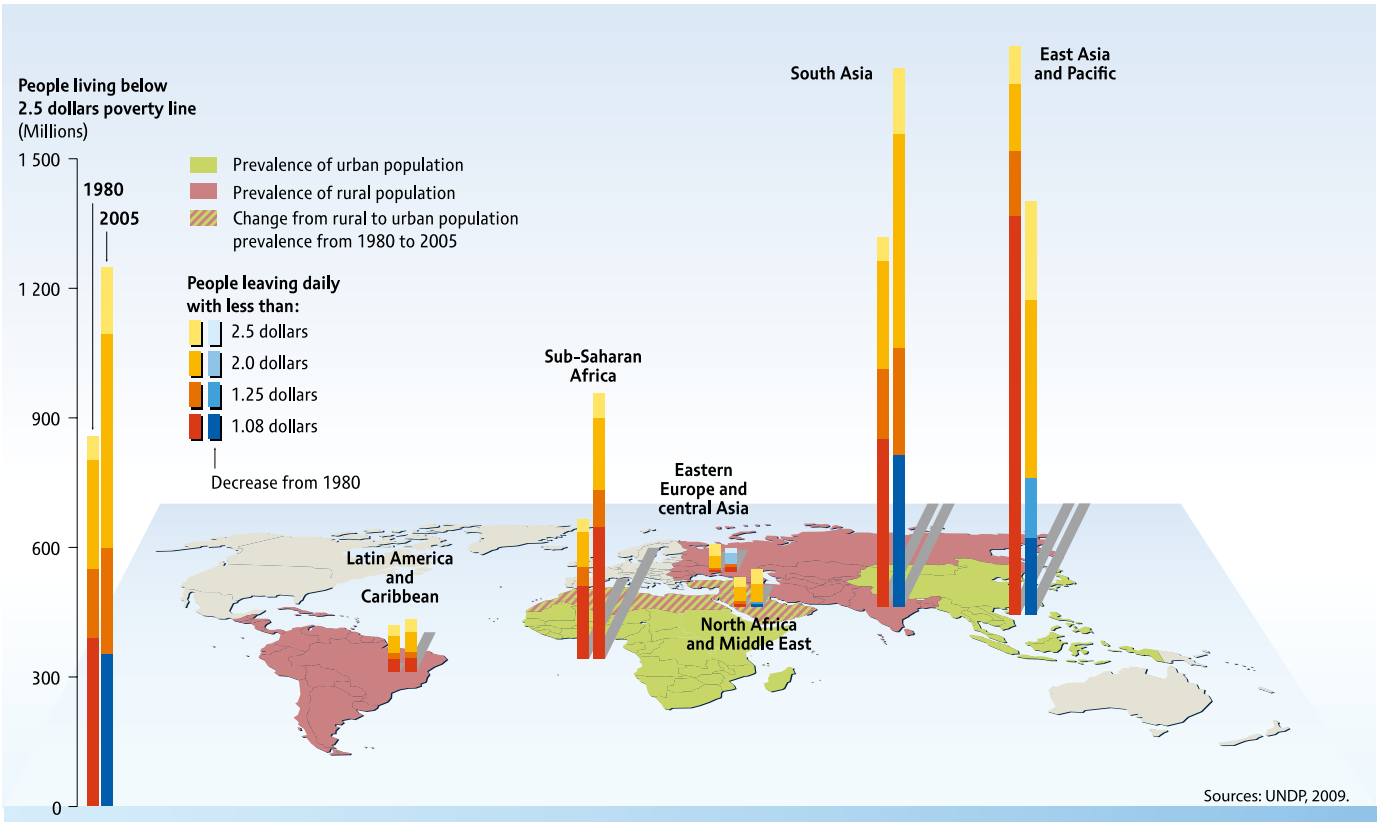
In addition to examining the importance of ownership for successful ecosystem enterprises, Roots of Resilience also looks closely at the increasingly critical role of intermediate organizations in promoting rural enterprise development. These organizations, which may be national, international or regional in scope, provide critical skills and access to key resources for rural enterprises.

An organization like Washington DC-based New Ventures, for example, provides business mentoring for small and medium enterprises, and links enterprises to potential investors. The Rainforest Alliance, meanwhile, helps small producers of forest products to receive sustainability certification and find appropriate market pathways for these goods. Such intermediaries are often non-profit in nature, but they can also take the form of government extension services, or for-profit development companies.

Networks

The value of networks – such as farming or fishing cooperatives, microfinance associations or forums that connect local officials with members of national governments – is also highlighted in Roots of Resilience as a key to the success of rural enterprises. Horizontal networks like producer cooperatives allow communities to learn from one another and take advantage of economies of scale, increasing the power of individual producers in the marketplace and improving the quality of goods via communication of best practices.

Vertical networks, which link producers or local organizations to international NGOs or government officials, are also critical for scaling up ecosystem-based enterprises. Where these relationships exist, it is not uncommon for practices implemented at the local level to be used as models for national standards. In Bangladesh, for example, a wetland management project piloted by a coalition of NGOs with connections to the national government was ultimately successful enough at improving the health of critical wetlands and at providing sustainable livelihoods to local populations that the national government has used the project as a model for its national forestry law.



Resilience for the road ahead

The three factors described above all contribute to the scaling up of rural ecosystem enterprises, and simultaneously enhance the resilience of rural communities in three ways: they make them more economically resilient – better able to face economic risks; they add to their social resilience – better able to work together for mutual benefit; and they make them more ecologically resilient – more productive and stable in the face of environmental changes such as climate change. These three forms of resilience are critical for sustainable development. A community with these qualities will tend to develop stronger ecosystem-based enterprises, while such enterprises will in turn enhance all three types of resilience. Importantly, a community's level of resilience will shape its capacity to deal with systemic shocks such as climate change.

The key lesson that emerges from Roots of Resilience is that focusing on the needs of the rural poor – the de facto stewards of natural resources around the world – can help address the combination of challenges that our society faces. Supporting the capacity of these rural residents to create and scale up ecosystem enterprises is one powerful way of helping to meet these needs while building resilience within rural communities. Those looking to lead a shift toward a truly sustainable global economy can find value in these lessons. Only by ensuring that the poor have lasting access to both natural resources and a vibrant marketplace can we begin to meaningfully address the environmental, economic and social challenges around us and create an inclusive and green global economy?

■ **About the author:** Lauren Withey works for World Resources Institute.

Forestry in Guatemala – benefits and challenges of ecological enterprises

Guatemala's northernmost region, El Petén, hosts a unique blend of natural beauty, biological diversity, and archaeological heritage dating back to ancient Mayan civilization. The Petén's 33,000 square kilometres of relatively undisturbed lowland tropical forests shelter 95 species of mammals, among them spider monkeys and pumas, and 400 species of birds, including the iconic scarlet macaw. The region is also home to an expanding melting pot of Guatemalan citizens: indigenous descendants of the Mayans, political refugees who sought refuge during 20 years of civil war, and economic migrants from the country's overpopulated cities and degraded highlands. A decade ago, deforestation had diminished biodiversity and threatened forest-based livelihoods in the region. Northern El Petén serves as the setting for one of the three main case studies examined in Roots of Resilience, for it is now home to successful community-run forestry enterprises whose sustainably harvested wood and non-timber forest products (NTFPs) are attracting the attention of overseas buyers.

With the support and supervision of non-government organizations (NGOs), donors and government agencies, community-owned forestry enterprises now steward more than 420,000 ha in the multiple use zone of the renowned Maya Biosphere Reserve (MBR). These enterprises are each in charge of one distinct parcel of land – a concession – that the Guatemalan government has leased to them. Forest product sales from these enterprises have brought new employment, infrastructure, social cohesion and income. Between October 2006 and September 2007, the concessions produced some $4.75 million in certified timber sales and close to $150,000 in sales of xate (palm leaves used for flower arrangements) and other non-timber forest products. Under village management, biodiversity has flourished and forest fires, illegal logging and hunting have declined dramatically, while continuing unabated in neighbouring national parks. By 2000, the forest concessions in the reserve managed by these community enterprises had become the world's largest tract of sustainably certified and community-managed forest. Many of the region's enterprises meet the international certification standard of the Forest Stewardship Council (FSC) for sustainably harvested wood, and several sell high-income finished products such as decking and floor panels in addition to timber.

This transformation of fragmented communities of farmers and illegal loggers into ecoentrepreneurs did not occur in a policy vacuum. Government decentralization policies, which awarded communities tenure rights and resource management responsibilities, provided an enabling environment and motivation for communities to protect their forests. Substantial assistance from donors and intermediary support organizations provided the funds and the technical expertise to make the concession model work. Progress toward financial and organizational independence for the enterprises has been slow, but the more successful ones now show signs of increased resilience. The overall results have proved promising enough for policymakers to consider scaling up the effort across the region. Already, communities in Honduras are replicating the concession model, while government agencies from Nicaragua, Panama and Peru have hired members of Petén's community-owned enterprises as consultants in sustainable forest management.

International Panel for Sustainable Resource Management

The sustainable management of resources has become a critical objective in the effort to reconcile socio-economic development and environmental preservation. It means we need to reduce overall resource requirements and environmental impacts to a level within the natural capacity of ecosystems, while increasing economic welfare and social well-being. This is referred to as "decoupling" environmental impacts from economic growth. It is also associated with increased resource productivity. Increasing resource productivity is indeed a win-win strategy, in particular for developing countries at the early stages of development.

International pressure to decouple is mounting in the face of converging priorities to create wealth, alleviate poverty and protect the environment. Dealing with such a complex problem requires cross-cutting solutions. Furthermore, a general consensus about the goals and roadmaps for the way forward is needed. However, such consensus does not yet exist, as the nature and scale of the problems and the solutions are difficult to estimate. Despite the developments in environmental sciences and methodologies, the results are still disputed. The technicality of the debates has been an impediment to the integration of scientific findings into the effective management of natural resources. A solid understanding and consensus on the scientific basis for decoupling is urgently needed to achieve sustainable development.

The International Panel for Sustainable Resource Management (Resource Panel) was launched in 2007 to help bridge this knowledge gap. The Panel aims at providing decision makers and other interested parties with independent and authoritative information about sustainable resource management. Brought together by the United National Environment Programme (UNEP), it consists of eminent scientific experts, highly reputed in the field of resource management. Its role is to provide policy relevant assessments that crystallize and evaluate the latest scientific, technical and socio-economic literature on global resource use, and highlights the means on how to move towards more sustainable resource management.

The Resource Panel expects to play a key role in linking the efforts of the business and scientific communities with policy makers. The business community, with its first hand knowledge of large scale resource consumption and the benefits of resource efficiency, has made strong contributions. In parallel, the scientific initiatives from academia and NGOs have led the way in providing a forewarning that humanity is facing severe resource constraints and key knowledge such as life cycle databases and material accounting.

For more information on the resource panel: www.unep.fr/scp/rpanel

Payment for Ecosystem Services in East & Southern Africa

*By **Alice Ruhweza***

Markets and payments for ecosystem services are gaining momentum in Africa, but government support is vital for scaling up.

Payments for Ecosystem Services (PES) is an arrangement whereby those who benefit from services provided by ecosystems – such as water supply and filtration, flood control, erosion protection, biodiversity conservation and carbon sequestration – can pay for them, while those who provide the services can secure financial benefits from their efforts. Markets for ecosystem services – some regulatory and others voluntary – now exist, the most common being those related to greenhouse gases (otherwise known as the carbon markets), water, and even biodiversity. The innovation that differentiates PES from previous paradigms or approaches is that the payments are contingent on the ecosystem service provider maintaining continuity of the specified ecological service.

In Africa, markets and payments for ecosystem services have been growing steadily. Two inventories of PES schemes by the Katoomba Group in 2005 and 2008 show growth from 45 to 68 PES and PES-like initiatives, an increase in money exchanging hands and considerable diversity in the projects and different types of payments being made (See Table 1). However, the inventories also report long gestation periods and lack of assurance that some projects will move from design to implementation. Few legal and policy changes have been made in the region to accommodate PES. However, this has not been a major constraint to the development of pilot projects. Last but not least, most countries reported increasing interest from buyers to purchase carbon offsets from Africa, but organizing sellers and being able to provide the quality of credits that meets the buyers' requirements is still a problem. For example, most buyers want certification to certain standards (such as the Voluntary Carbon Markets and the Climate Community and Biodiversity standards), which sellers cannot afford.

Markets and payments for ecosystem services are gaining momentum in Africa, but government support is vital for scaling up.

PES assessments carried out by the East and Southern Africa Katoomba Group find the following challenges to markets and payments for ecosystem services in the region, which can be divided into

- Information barriers
- Technical barriers
- Policy and regulatory barriers
- Institutional barriers

Information barriers: Most sellers of ecosystem services do not understand the market. For example, they do not understand the Kyoto Protocol's CDM guidelines or even the voluntary market and how it works, and whether or not they would qualify. Potential buyers of ecosystem services (consumers, businesses, utilities, government agencies at all levels) are often unaware of their dependence on ecosystem services. In addition, potential sellers are not aware of ecosystem service payments and markets and few know how to find potential buyers. Further compounding the situation, few policymakers and regulators are knowledgeable about the policy requirements and implications of payments for ecosystem services. Finally, there is a shortage of service providers and project developers to assist with nascent PES deals. As a result of these information gaps, most of the projects in the countries inventoried are ad hoc, decentralized and do not follow any uniform guidelines.

Technical barriers: Most countries inventoried lack individuals and organizations with the requisite knowledge to organize, design and implement payments for ecosystem services (PES) effectively. Even where sellers and buyers may be aware of the ecosystem services there is often a lack of readily available technical skills needed for PES, such as experience with methods for calculating the financial value of these services and assessing the price that buyers would be willing to pay and sellers willing to receive. In addition, best practices have not yet been established through extensive on-the-ground experience and examples in the region. This gap increases the risks for buyers, both in terms of reputation and return on investment. For prospective sellers – including land and resource owners as well as environmental stewards – the technical barriers are significant. Few have access to the specialized skills needed to assess the market potential of their resources and the resource management options that might be available to help them focus on restoring and maintaining ecosystem services. Also, PES models that clearly work for extremely low-income communities are few and often unproven. And if low-income community members wish to go beyond carbon or water deals, in particular to consider bundled multiple ecosystem services, they find that robust and proven models for biodiversity payments are especially lacking.

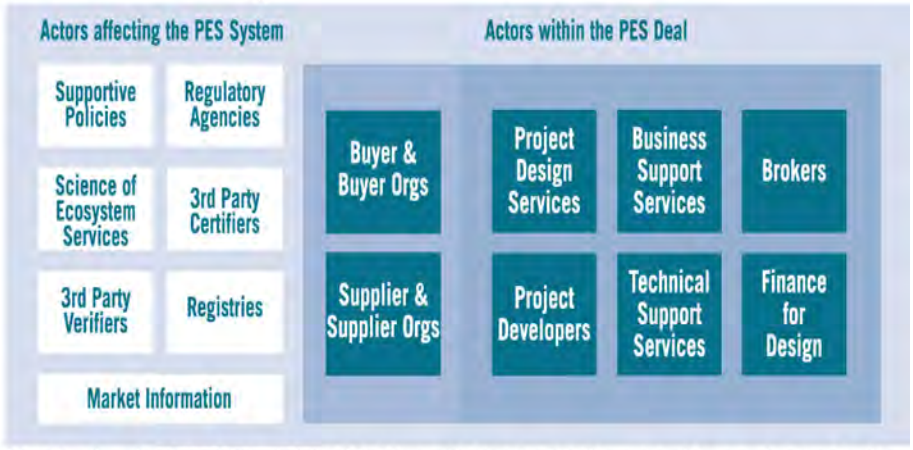
Policy and regulatory barriers: In many cases there is confusion about appropriate government roles in the development and operation of specific types of PES. Sometimes problems have arisen from insistence by government officials that flows of funds should go through particular agencies. More fundamentally, there are conflicts over delivery of ecosystem services as private goods as opposed to public goods, over existing rights to ecosystem services and the flow of benefits from their sale, and over equity issues for low-income buyers or sellers of ecosystem services. Policy confusion also exists. Misunderstandings are also related to whether ecosystem service payments should be bundled so as to ensure that the full set of ecosystem objectives are met, or whether payment or market systems should focus on particular ecosystem services valued by interested buyers. The lack of policy support is felt more at the expansion stage, and, in some cases, it reduces the price buyers are willing to pay. Thus, without clear policy and regulatory arrangements, potential PES buyers hesitate, since the legal standing regarding purchases and the enforceability of contracts is uncertain. Private sector buyers may also be unsure about the political and public acceptability of their role in PES. In addition, both buyers and sellers may be uncertain about underlying tenure rights for land and resources, thereby increasing the risks of long-term ecosystem service agreements.

Table 1: Inventory of PES schemes by Katoomba Group in Uganda, Kenya, Tanzania and South Africa

	Total number of projects recorded in 2005	Total number of projects recorded in 2008	Number of projects where payments had exchanged hands in 2005	Number of projects where payments had exchanged hands in 2008
Biodiversity	18	19	2	5
Carbon	17	27	5	10
Water	10	16	2	4
Bundled		6	0	
Total	**45**	**68**	**9**	**19**

Source: The Katoomba Group. The full national inventories for South Africa, Kenya, Uganda, Tanzania, and Malawi are accessible online at http://www.katoombagroup.org/~katoomba/regions/africa/assessments.php

Figure 1: An example of institutions required for PES schemes



Adapted from: Bracer, C., S. Scherr, A. Molnar, M. Sekher, B. O. Ochieng, and G. Sriskanthan. 2007. "Organization and Governance for Fostering Pro-Poor Compensation for Ecosystem Services." CES Scoping Study Issue Paper No. 4, ICRAF Working Paper No. 39. Nairobi, Kenya: World Agroforestry Center.

Institutional barriers: Most African countries lack the necessary institutions – such as certification bodies, financial intermediaries, national registries for ecosystem services – across the value chain from seller to buyer. This increases current PES transaction costs (see Figure 1 below). In most of the CDM projects, for example, to actually achieve ecosystem service benefits a company would have to cover a larger area. Most single companies are not willing to do this. Currently, most PES support in the countries inventoried is provided by the international public sector or by conservation NGOs still in the early stages of the PES learning curve, rather than by business leaders or seasoned leaders in PES development.

A role for governments?

Very few of the PES schemes inventoried by the Katoomba Group in 2005 and 2008 are driven by government and, moreover, very few legal or policy changes have been made by governments to accommodate PES. Conversations with policy makers during Katoomba meetings in Uganda (2005), South Africa (2006) and Tanzania (2008) revealed a great interest in PES, but also a lingering scepticism – particularly around whether PES schemes are compatible with or can support poverty reduction, which is the overriding objective of governments. The concerns continuously raised by government officials are the low price of carbon credits, high transaction costs and the prohibitive opportunity cost for many farmers engaging in carbon projects.

The Katoomba Group believes that government can and should play a key role in facilitating PES by investing in the development of designated institutions that can serve as centres of excellence, PES information hubs or facilitators of PES schemes, or that can fulfil the role of honest brokers. This includes institutions to facilitate the aggregation of carbon crediting amongst a large number of smallholders, certification and verification bodies, registries, contract negotiators and monitoring and enforcement organizations that can ensure that projects are delivering the ecosystem services. Investing in such local institutions would reduce the transaction costs of hiring international experts to do the same job. Related to this is a need for capacity-building of home-grown service providers and project developers.

Governments should also play a role in clarifying tenure and property rights where they are not clear and agreements must be reached on who has rights to payments for ecosystem services. There are many cases where poor communities are stewards of ecosystems and should be paid for such services. However, they do not have property rights.

Furthermore, governments should set up clear rules and guidelines for PES: what the services are, what buyers should pay for, at what price, and so on. This would reduce risks and assure interested buyers (particularly the private sector) that they are indeed getting what they are paying for.

Last but not least, Government can put in place an enabling legal and policy framework that links communities to ecosystem service markets and facilitates the flow of conservation finance from private and public sectors to communities.

■ **About the author:** Alice Ruhweza is a private consultant with expertise spanning the areas of trade, telecommunications, health, and the environment with a special emphasis on payments for ecosystems services (PES). She coordinates the East and Southern Africa Katoomba Group (www.katoombagroup.org), a regional working group of individuals interested in advancing environmental markets.

Job prospects in a low-carbon world

*By **Michael Renner**, **Sean Sweeney** and **Jill Kubit***

The pursuit of so-called green jobs will be a key economic driver as the world steps into the uncharted territory of building a low-carbon global economy. Climate-proofing the economy will involve large-scale investments in new technologies, equipment, buildings and infrastructure, which will provide a major stimulus for much-needed new employment and an opportunity for retaining and transforming existing jobs.

The number of green jobs is already on the rise. Most visible are those in the renewable energy sector, which has seen rapid expansion in recent years. Current employment in renewables and supplier industries stands at a conservatively estimated 2.3 million worldwide. The wind power industry employs more than 400,000 people; the solar photovoltaics (PV) sector, an estimated 170,000; and the solar thermal industry, more than 600,000 (mostly in China). The expanding concentrating solar power industry is adding to these numbers. And more than 1 million jobs are found in the biofuels industry – growing and processing a variety of feedstocks to produce ethanol and biodiesel.

Wind and solar are poised for continued rapid expansion. Under favourable investment projections, wind power employment worldwide could reach 2.1 million in 2030, and the solar PV industry might employ as many as 6.3 million people by then. In addition to manufacturing jobs, there will be many jobs in installing and maintaining systems. In Bangladesh, for instance, the spread of solar home systems – which might reach 1 million by 2015 – could eventually create some 100,000 jobs.

Still, many more green jobs than in energy production will eventually be created through the pursuit of more efficient buildings, machinery, vehicles and appliances.

Construction jobs can be greened by ensuring that new buildings meet high performance standards. This is particularly important in Asia, which is undergoing a construction boom. And retrofitting commercial and residential buildings to make them more energy-efficient has huge job potential for construction workers, architects, energy auditors, engineers and others. For instance, the weatherization of some 200,000 apartments in Germany created 25,000 new jobs and saved 116,000 existing jobs in 2002-04 at a time when the construction industry faced recession. Providing decent and efficient housing in the developing world's urban agglomerations and slums presents an unparalleled job creation opportunity.

Incorporating the very best in fuel efficiency technology would dramatically lessen the environmental footprint of motor vehicles. An assessment of the most efficient cars currently available suggests that relatively green auto manufacturing jobs may today number no more than about 250,000 out of roughly 8 million direct auto sector jobs worldwide. But a concerted push toward much greater efficiency and carbon-free propulsion systems is needed. Likewise, retrofitting highly polluting two-stroke engines that are ubiquitous, especially in Asia, to cut their fuel consumption and emissions would create many jobs.

Overall, the reliance on cars and trucks needs to be reduced. Railways offer an alternative, yet many jobs have been lost over the last few decades as rail has been sidelined. In Europe, railway manufacturing and operating employment is down to about 1 million. Even in China and India, rail jobs fell from 5.1 million to 3.3 million from 1992 to 2002. A recommitment to rail, as well as to urban public transit, could create many millions of jobs. There are also substantial green employment opportunities in retrofitting old diesel buses to reduce air pollutants and in replacing old equipment with cleaner compressed natural gas (CNG) or hybrid-electric buses. In New Delhi, the introduction of 6,100 CNG buses is expected to create 18,000 new jobs.

Basic industries like steel, aluminium, cement and paper may never be truly green, as they are highly energy-intensive and polluting. But increasing scrap use, greater energy efficiency, and reliance on alternative energy sources may at least render them a pale shade of green – though "a green shade of brown" might be a more appropriate description. Secondary scrap-based steel production requires up to 75% less energy than primary production. Worldwide, 42% of steel output was based on scrap in 2006, possibly employing more than 200,000 people. Likewise, secondary aluminium production uses only 5–10% as much energy as primary production. About one quarter of global aluminium production is scrap-based. No global employment numbers exist for this, but in the United States, Japan, and Europe it involves at least 30,000 jobs. The cement and the paper and pulp industries have similar greening potential, but like the aluminium industry they are relatively small employers.

The number of recycling and remanufacturing jobs worldwide is another unknown. In developing countries, paper recycling is often done by an informal network of scrap collectors, sometimes organized into cooperatives in order to improve pay and working conditions. In Cairo, some 70,000 Zabbaleen recycle an estimated 85% of the materials they collect. Brazil is thought to have some 500,000 recycling jobs. China, with estimates as high as 10 million jobs, trumps all other countries in this area.

The potential for green jobs is immense. To date, however, the green jobs rhetoric still outweighs concrete actions.

For many developing countries, a key concern is the future of agriculture and forestry, which often still account for the bulk of employment and livelihoods. Small farms are more labour- and knowledge-intensive than agroindustrial farms, and they use less energy and chemical inputs. Organic farming is still limited, although expanding as consumers in Western countries become more conscious about health and environment matters. For the time being, at least, organic products remain a niche market, in part because higher prices limit their affordability. More labour-intensive than industrialized agriculture, this can be a source of additional green employment in the future. A study in the United Kingdom and Ireland showed that organic farms employed one third more full-time equivalent workers than conventional farms do.

Afforestation and reforestation efforts, as well as generally better stewardship of critical ecosystems, could support livelihoods among the more than 1 billion people who depend on forests, often through non-timber forest products. Planting trees creates large numbers of jobs, although these are often seasonal and low paid. Agroforestry – which combines tree planting with traditional farming – offers significant environmental benefits in degraded areas, including carbon sequestration. It has been shown to provide food and fuel security and to create employment and supplementary income for small farmers. Some 1.2 billion people already depend on agroforestry to some extent.

There is additional job potential in dealing with the accumulated environmental ills of the past and improving the ability to cope with the climate change that is already inevitable. Building flood barriers, rehabilitating wetlands and coastal forests, and efforts to adapt farming to climate change (through conservation tillage, greater water efficiency, etc.) would likely employ large numbers of people.

Green jobs need to be decent jobs – offering good wages and income security, safe working conditions, dignity at work and adequate workers' rights. Sadly, this is not always the case today. Recycling work in particular is often precarious and can involve serious occupational health hazards. Growing crops for biofuels at sugarcane and palm oil plantations often involves excessive workloads, poor pay, exposure to pesticides and oppression of workers.

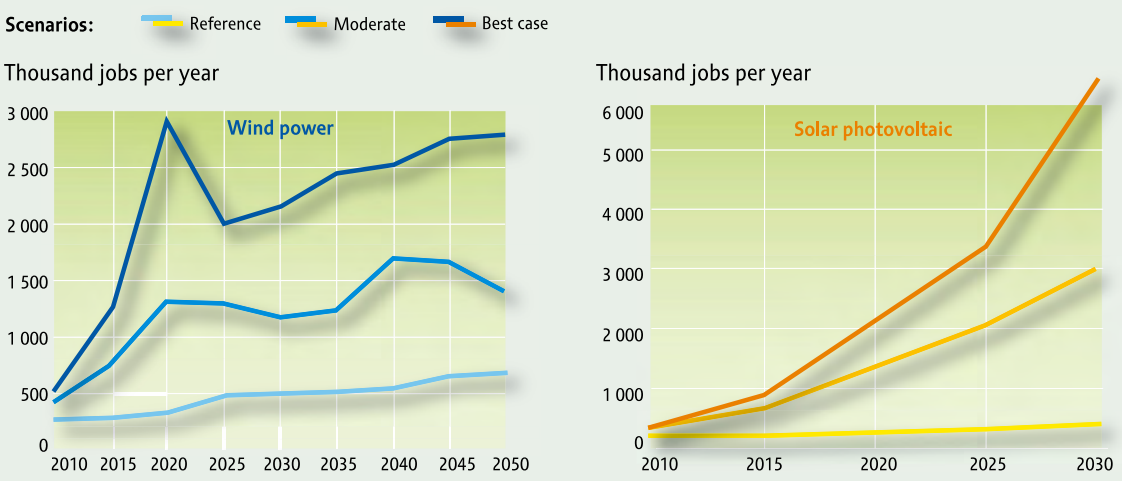
To realize the full potential, sustained public and private investments are required, and governments need to establish a firm and predictable policy framework for greening all aspects of the economy. It will also be critical to develop innovative forms of technology transfer to expedite the spread of green methods around the world. In part, this may require new institutions, such as the newly established International Renewable Energy Agency. However, a fresh look at global trade and intellectual property rules – an assessment whether these rules are consistent with a sustainable economy – will also be necessary. Finally, an expansion of green education, training and skill-building programs is crucial. None of these are politically easy tasks. Their completion requires not only visionary and courageous leadership, but also growing public awareness and bottom-up pressure.

The potential for green jobs is immense. To date, however, the green jobs rhetoric still outweighs concrete actions on the part of most governments and corporations. Indeed, unsustainable business practices continue to be more prevalent than green success stories. The bulk of economic stimulus packages passed in early 2009 attempted to reinvigorate consumption instead of laying the groundwork for a transition toward a greener economy.

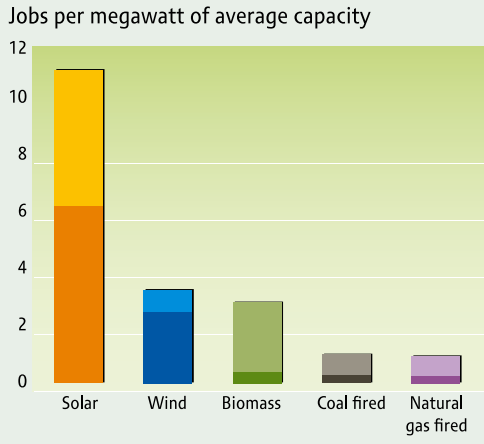
Relative to the overall labour market dynamics worldwide – the need to create tens of millions of additional jobs each year – green jobs are not yet growing fast enough. There is, in fact, a rising informality in the global economy that runs counter to the goals of green job creation. Seen in this broader context, the green job challenge is less a technical issue (reducing carbon footprints and avoiding other negative environmental impacts) and far more a question of how to restructure the economy so that it truly works for human needs.

■ **About the authors:** Michael Renner is a Senior Researcher at the Washington, DC-based Worldwatch Institute. Sean Sweeney and Jill Kubit are the Director and Assistant Director, respectively, of Cornell University's Global Labor Institute in New York City. This article is derived from a 2008 study the authors produced, Green Jobs: Towards Decent Work in a Sustainable, Low-Carbon World, for the joint UNEP/ILO/ITUC/IOE Green Jobs Initiative (available at: http://www.unep.org/labour_environment/features/greenjobs-report.asp).

Green Jobs in the future



Average employment over life of facility



Source: UNEP-ILO-IOE-ITUC, Green Jobs: *Towards decent work in a sustainable, low carbon world,* 2008.

The attractiveness of the SIWA oasis offers a great opportunity for both the local community and the ecotourism business. *SIWA.*

The Poverty and Environment Nexus: A Business Opportunity?

*By **Sahba Sobhani** and **Austine Gasnier***

There is ample evidence that we are using the planet's resources faster than they can be renewed, and humanity's ecological footprint, our impact on the planet, has more than tripled between 1961 and 2003. The biggest contributor to our footprint is the way we generate and use energy: our reliance on fossil fuels to meet our energy needs continues to grow and climate-changing emissions now make up 48% of our global footprint. If continued, the current status of usage of the world's energy resources paints a destructive path for the future of development. Today, nearly 1 billion households lack access to clean and proper energy supplies, relying instead on resource-depleting, pollution-creating and health-damaging sources such as wood and fuel oils.

This situation urgently demands that all actors take action, including the private sector. But beyond the need for the private sector to address environmental challenges, the very same challenges represent a significant business opportunity. A large-scale study undertaken by the International Finance Corporation (IFC) and partners to specifically examine the risks and opportunities of sustainability for businesses across emerging economies, found that many businesses were gaining benefits (such as higher sales, reduced costs and lower risks) from better corporate governance, improved environmental practices, and investment in social and economic development.

At the crossroads between business case, poverty alleviation and environmental sustainability

The Growing Inclusive Markets initiative is a multi-stakeholder research and advocacy platform led by the United Nations Development Programme (UNDP) that seeks to promote greater inclusion of poor people in markets of goods and services as consumers, producers and employees. This initiative reflects UNDP's strong conviction that the private sector is a great untapped resource for achieving investment and innovation to achieve the Millennium Development Goals (MDG), including MDG 7 which focuses on environmental sustainability.

Inclusive business models in short

Inclusive business models include the poor on the demand side as clients and customers, and on the supply side as employees, producers and business owners at various points in the value chain. The benefits go beyond immediate profits and higher incomes. For business they include driving innovation, building markets and strengthening supply chains. And for the poor they include higher productivity, sustainable earnings and greater empowerment.

The initiative's main contribution is to create a climate in which intermediary institutions can make markets more inclusive by gathering relevant information, highlighting good examples, developing tools to support business and market development strategies, and creating space for dialogue at both the global and local level.

Its 2008 flagship report, Creating Value for All – Strategies for Doing Business with the Poor – was based on empirical evidence from 50 specially commissioned case studies of inclusive business models across regions, sectors and types of companies. The report analyses constraints and strategies for companies to expand beyond traditional business practices and bring in the poor as partners in wealth creation. A number of these case studies feature companies that have developed financially sustainable business models with significant environmental benefits, thus contributing to a greener economy.

A wealth of inspiring examples

Many inclusive business models contribute to both human development and environmental sustainability: water provision,

Green fashion improving women's lives

In Rwanda the new fashion is to wear these beautiful, colourful, quite unique necklaces, made out of neither precious stones nor expensive materials, but something as simple as out-of-date magazines and calendars. Various women's associations have adopted this original way of making jewellery and some are even exporting to neighbouring countries. The women get cash-in-hand for their work and together with their agricultural activities they are now able to cover basic needs and even set aside some savings.

A member of one such cooperative, Alphonsine Mukansanga, explains: "I was only a farmer before joining the Tuberwe cooperative. After joining the cooperative I could afford to buy clothes, food and medical insurance and help my family when needed and when they are ill. I am now even able to save some money for cases of emergency."

In Rwanda poverty affects a larger number of women than men, and its impact is more severe too. Furthermore 86% of the women work in agriculture and only 33% of them are engaged in some kind of wage-earning employment in the non-agricultural sector. But women also take charge of collecting water, food and cooking energy for the household. Women are consequently extremely vulnerable to environmental stress. To improve women's livelihoods it is crucial to diversify their sources of income. With women much more likely than men to invest in their families and their children's education, efforts to target women are also key to achieving the goal of poverty reduction in Rwanda.

Recycling paper has not only become an income-generating activity for poor women, it also contributes to the Rwandan government's objective of keeping Kigali clean. Glossy papers, magazines and old calendars are now turned into the most beautiful and colourful necklaces. Not only are the women using old paper, but baskets and bags are being made out of organic waste materials, such as banana and palm leaves and sisal. After plastic bags were banned in the country in 2005, a whole new market for alternatives to plastic bags developed and the Tuberwe cooperative is now selling an increasing number of baskets to meet growing demand. The women in Rwanda have really proved that a more sustainable and resource efficient economy can indeed provide green jobs!

Recycled paper turned into beautiful necklaces. *Elise Christensen/UNDP-UNEP PEI.*

Sulabh's coin-operated toilet facilities provide low-cost sanitation to poor consumers. *Sulabh.*

"Central Forest", one of Huatai's fast-growing trees model districts, covering about 60 hectares. *Huatai.*

energy generation, agriculture, recycling, or tourism (see examples below). They show that commercial success, environmental sustainability and poverty alleviation can go hand-in-hand, although many constraints specific to the markets of the poor stand in the way. Innovative strategies are therefore needed to overcome these market constraints and develop successful models.

Technology, for instance, can help companies to do business under difficult conditions and more sustainably. For example renewable energy sources can generate electricity for the 1.6 billion people who still lack access to it without exerting further stress on the world's climate. Clean sanitation technology is a sustainable and cost-effective alternative for low-income population. Biodigesters can transform waste from pig farming into energy, food for fish breeding and biofertilizers. Business models adaptations, such as sourcing from local communities or deploying recycling, are additional ways for businesses to contribute to environmental sustainability.

Providing cleaner energy

In Mali, where only 10% of the population has access to electricity, the rural energy service companies set up by Electricité de France and its partners are providing electricity to underserved rural areas through solar home systems and diesel generators. The elimination of kerosene lamps has improved indoor air quality. In addition solar systems and generators – which might be replaced by biofuels in the future – save respectively around 95% and 85% of CO_2 emissions compared to traditional energy sources. The companies are already breaking even and profits are expected to reach 12 to 15%. At the same time the service will generate a significant human development impact for the 40,000 people currently being served, improving their ability to pump water for livestock and electrifying healthcare centres, schools and small businesses, with over 50 new local jobs and economic spin-offs.

Promoting ecologically-friendly tourism

In Egypt, Environmental Quality International (EQI), a Cairo-based consultancy, has implemented the Siwa Sustainable Development Initiative, with a portfolio of enterprises and projects that include eco-lodges, women's artisanship, organic farming and community art, all of which contribute to revitalizing cultural heritage and nourishing ecologically-friendly tourism. EQI is also implementing a renewable energy initiative that uses biogas digesters to produce biofuel for lighting and cooking, as well as organic fertilizers. It also contributes to prevention of water depletion and further deterioration of soil resources, and raises staff awareness of environmental conservation. These initiatives have created 75 direct jobs and income-generating opportunities for over 300 members of the local community, while generating a profit, partly used to support local entrepreneurship and enhance living standards for the poor through the provision of financial services, as well as the construction of a cinema and library.

Improving Sanitation Systems

It is estimated that 2.6 billion people lack adequate sanitation around the world. In India, Sulabh International, a local NGO, has developed a commercially viable business model, training 60,000 poor people, mostly women. Sulabh employed low-cost sanitation technology using locally available materials to design environmentally-friendly toilets that require little water for flushing. By 2006 Sulabh had installed 1.4 million household toilets and maintained 6,500 public pay-to-use toilets, with an estimated 10 million people using the facilities across the country. Most of the public toilets run by Sulabh break even in eight to nine months, and some are highly profitable. In 2005 Sulabh's revenues reached $32 million, with a 15% surplus reinvested in social programmes.

Using forest biodiversity sustainably

In 2000 the Huatai Paper Company Ltd, the largest newsprint manufacturer in China, launched a new strategy to substitute wood pulp for straw pulp. Paper production from wood pulp reduces the amount of pollutants six to seven-fold and does not require chlorine for bleaching. The key was mobilizing local farmers to plant fast-growing trees. Farmers get support through technology, education and irrigation from Huatai and the local government, convinced by the company about the potential win-win nature of this initiative. About 6,000 households have taken part, planting 40,000 hectares of fast-growing trees and generating a significant new source of income. The triploid white poplar trees grow on formerly unused salty land. Meanwhile, Huatai has grown its newsprint business and is minimizing the risk from volatile import prices for pulp.

Investing in the recycling industry

Together with water and sanitation systems, or electricity grids, waste collection is often part of the missing infrastructure that characterizes the markets of the poor. With about 85,000 tonnes of waste generated every day, Mexico is the tenth largest garbage producer in the world. At the same time, tens of thousands of people, including children, are making a living by scavenging saleable items from open-air dumps in very tough, informal conditions. The founders of the Petstar company saw an opportunity in this challenging situation. They realised value could be added to the plastic collected, by closing the recycling value chain, linking the scavengers to the bottling industry. They built the first bottle-to-bottle recycling facility with high-tech automated machinery in Latin America. This innovative project will improve the scavengers' working conditions by creating separation centres and offering formal contracts. It will also reduce child labour through specially created community education centres, and increase social awareness of the importance of recycling through organized visits to the recycling plant. Last but not least it will yield returns for the company through the sale of the recycled material.

In Philippines, CocoTech, thanks to a fruitful collaboration with a government research institute, managed to turn the challenge of waste into a real business opportunity by converting unused coconut husks into a whole range of environmentally-friendly products such as coco pots, pot liners, grow poles, brushes and rope, while producing a strong social impact on the local community which processes them. CocoTech grew from a small community-based project with an initial capitalization of about US$7,000 and five employees in 1993 into a medium-sized enterprise of 25 employees with revenues exceeding US$300,000 in 2006 and more than 6,000 families involved in the manufacture of CocoTech products.

Evidence from the field reveals that there is a lot of untapped potential for companies willing to develop business models that have positive impacts on the bottom line, the lives of the poor and the environment simultaneously. However, grasping this opportunity is difficult due to numerous market constraints, such as limited market information, inadequate infrastructure, ineffective regulatory frameworks, missing knowledge and skills, or restricted access to financial services. And yet, as the case studies show, entrepreneurs have found successful strategies to overcome these constraints, from adapting their products (Sulabh), to investing in infrastructure and education (PETSTAR), leveraging the strengths of the poor (EQI), combining resources and capabilities with others (CocoTech), or engaging with governments (Huatai).

However, further research is needed to get a better understanding of how economic, social and environmental value is created and distributed, and what results can inclusive business models generate. This will therefore be one of the focuses of the second phase of the Growing Inclusive Markets Initiative and its next set of case studies currently being commissioned with a view to highlight good practices, share lessons learnt, and thus encourage the private sector to action.

■ **About the author:** Sahba Sobhani is a Programme Manager, and Austine Gasnier is a Research Associate at Growing Inclusive Markets Initiative, UNDP. The views expressed in this paper are the authors' and do not necessarily represent those of the United Nations Development Programme.

Towards triple impact. Toolbox for analysing sustainable ventures

Sustainable ventures can make a significant contribution to poverty alleviation and environmental sustainability. These business initiatives and activities improve human well-being and the environment on a profitable basis (people, planet, profit), contributing to decoupling economic growth and improvements in well-being from natural resource use.

Developing and managing sustainable ventures is a challenge. Key questions related to the identification of opportunities, the understanding of the determinants of success and the assessment of costs and benefits appear repeatedly.

The UNEP publication, Towards triple impact. Toolbox for analysing sustainable ventures in developing countries, introduces a toolbox that helps to answer such questions. It addresses initiatives that support sustainable ventures including donor programmes, award schemes, private and public investors, professional education programmes and policy makers. They can use the tools to systematically identify, evaluate, advice, and promote sustainable ventures.

The toolbox can be downloaded in English, Spanish and French from www.unep.fr/scp/poverty/publications. Publisher: UNEP

Green Jobs: Towards decent work in a sustainable, low-carbon world, by the Worldwatch Institute (2008)

This report by the Worldwatch Institute has been commissioned and funded by UNEP, as part of the joint UNEP, ILO, IOE, ITUC Green Jobs Initiative. The report is the first comprehensive study on the emergence of a "green economy" and its impact on the world of work. It includes new data that shows a changing pattern of employment in which green jobs are being generated in many sectors and economies around the world as a result of measures to tackle climate change and reduce greenhouse gas emissions. This has also led to changing patterns of investment flows into areas such as renewable energy and energy efficiency at the household and industrial level. Within current policy frameworks, only a fraction of the potential benefits for jobs and development is forthcoming.

The Report is available for download (English & Chinese) at www.unep.org/civil_society/Publications/index.asp and www.unep.org/labour_environment/features/greenjobs.asp. Publisher: UNEP EP 8-08 #200763569

Land and sea abound with examples of change and imminent action for a green economy.

Agriculture for shift to a Green Economy

By **Asad Naqvi** and **Njogu Morgan**

The world is in the grip of economic, environmental and social crises. On the environmental front, some of the worst case scenarios of abrupt and dangerous climate change are occurring. Between 53 to 100 million more people could fall into the $2-a-day poverty trap in 2009 as a direct result of the financial crisis. Global unemployment in 2009 could increase by up to 50 million over 2007 levels if the situation continues to deteriorate. Although food prices are slightly declining from some of their highest levels in many decades they are expected to remain high.

A majority of poor people in developing countries live in rural areas and most depend on agriculture for their livelihoods. One way of addressing the poverty, in all of its dimensions, is to transform agricultural practises to ensure greater food security, more and decent employment opportunities, and supplementary incomes that can be used to meet needs such as health care and education.

In the last few decades, a common response to this challenge has been to prescribe intensified high chemical input agricultural methods. By some measures, these methods have been successful. For example they have helped to double global crop production in the last forty years helping to produce enough that can feed six billion people albeit very unevenly. In other measures – such as impacts on human health, greenhouse gas emissions, sustainability of yields and depletion of natural resources - they have performed poorly. This led an international panel of scientists to call for systemic changes in the way the world produces its food and fibre.

This article discusses how sustainable agriculture,[1] a key catalyst for shift to a Green Economy, is helping reduce the burden of poverty while protecting the environment.

Alleviating Poverty

"...the lessons I had from Manor House and those that I continue to receive from Eric Kisiangani and his colleagues at Rural Technology Centre have moved my household from misery to normal rich life comparatively. My small 'shamba' is producing surplus which I sell for income. Last season, April to June, I earned Kshs. 15,000 ($268) from sales of Sukuma Wiki (similar to tree collards). My 0.3 acres of land is producing enough of healthy vegetables that bring money to knock at my door in the wee hours of the day. I mean, people come knocking at the door of my house before 6.00am wanting to buy vegetables. Apart from food and money for my family, I am able to fertilise my soil from material that it produces and supports. BIA [Bio-intensive agriculture] has recreated hope in me and my household. I can now face the future proudly."

This is a story as told by Susan Wakesa on the value of the training she received in sustainable agriculture from an organisation we have worked with in East Africa. This is by no means an isolated case. Higher price premiums and incomes in sustainable agriculture than can be attained with conventional crops are helping a growing number of producers to escape the poverty trap in simple but meaningful ways. Some farmers, especially in developing countries, are able to offer their children better lives since they can now afford to send them to school, pay for their health care and provide food. Others are shrugging away the debt yoke because of the lower input costs involved.

The story is yet more optimistic. Organic agriculture provides more jobs than conventional using about thirty percent more labour depending on farm size and crop. This employment ratio rises even slightly higher if a farm is involved in other steps of the "farm to fork" supply chain. It is due to these characteristics that in 2007, Mexico was able to create an additional 178,000 jobs by converting some of its agricultural production to organic farming. In other words, sustainable agriculture can help address unemployment. .

Food on the table, reliably

Another way in which sustainable agriculture relieves poverty is through enhanced food security for producers and consumers. Practices such as intercropping, use of diverse and traditional crop varieties, and crop and animal rotation not only help build breeding grounds for biodiversity but also ensure security of food supply in the face of environmental and socio-economic woes. These methods are helping to increase yields and productivity in general. For example, farmers in Kenya, Tanzania and Uganda participating in a programme to transition into sustainable farming methods have increased their productivity by more than 100% and ensured greater food security.

Protecting the environment

Turning to environmental stewardship, there is increasing evidence that sustainable agriculture has a low footprint in a range of indicators. Research shows that organically managed farms have higher levels of biodiversity compared to conventional ones. Increased water retention, reduced soil erosion, and efficient use of water are some of the other environmental benefits observed due to sustainable farming methods. Emerging data also suggests that sustainable agriculture is a good companion in efforts to mitigate and adapt to climate change. Practices such as mulching, perennial cropping, crop rotation and organic manure application allow for higher levels of carbon sequestration at 3 to 8 tonnes more carbon per hectare than conventional farms. Sustainable agriculture also has a low greenhouse gas emission profile due to lower levels of energy utilisation and higher energy efficiency.

Catherine Badgley
Assistant Professor and Research Scientist, University of Michigan

Conclusions

Our account of sustainable agriculture shows 'win-win' possibilities in poverty alleviation and environmental protection. This suggests that it is ready for wider adoption. In developing countries where poverty is chronic, this transition will be easier in some respects because most farming is 'near' sustainable because of the predominance of subsistence agriculture which uses low levels of inputs. The transition to sustainable agriculture by poorer farmers previously practising very basic methods of agriculture as we have seen in East Africa is also generally associated with yield increases and incomes. We are however mindful of some challenges that actors face in the sector such as poor farm to market and export infrastructure in developing countries, the need to invest in research and learning since sustainable agriculture is knowledge intensive, protectionist tendencies in some developed countries, trade distorting subsidies and price volatility for some commercial products in the open marketplace, to name a few. These are not insurmountable and the flurry of activities that we increasingly see, led by both public and private actors in the development of more sustainable agriculture inspires optimism.

Honorable Prime Minister of United Republic of Tanzania, Mr. Edward Lowassa, officially launched the East African Organic Product Standard (EAOPS) developed with the support of UNEP and its partners.

■ **About the authors:** Asad Naqvi (Programme Officer) and Njogu Morgan (Research Assistant) work at the Economics and Trade Branch of UNEP. The views expressed in this article are largely those of the authors and do not necessarily reflect the views of the UNEP secretariat.

1. Sustainable agriculture is an inclusive concept. It refers to principles and practices that aim to minimise or eliminate social and environmental harm while ensuring a steady and plentiful supply of food in the immediate and long run. Organic, biodynamic and Fairtrade are some examples of sustainable agriculture.

Better Cotton Initiative

Agriculture is strongly intertwined with the world economy, the livelihoods of the world's poor, and biodiversity conservation. Agriculture uses more than half of the Earth's habitable land, employs more than 1 billion people and produces goods worth $1 trillion annually. It is also the biggest user of water, accounting for almost 70% of global withdrawals, and up to 95% in developing countries. Furthermore, pesticide and fertilizer use on agricultural crops leads to widespread ecological degradation. Estimates indicate that up to 40,000 lives are lost around the world each year due to improper pesticide application and handling.

The Better Cotton Initiative (BCI) exists to respond to the current impacts of cotton production worldwide. Cotton can be a water-intensive and pest-sensitive crop, and is often grown in semi-arid and water scarce areas. Its cultivation represents over 2.4% of global arable land, involving about 30 million farmers. Cotton is produced in more than 65 countries worldwide, a majority of which are classified as developing countries. The economies of some developing countries and the livelihoods of millions of farmers and their families are dependent on cotton production.

Approximately 80% of people involved in cotton production are on small farms. In this respect cotton is different from other value chains, where a greater proportion of people working in the sector are involved in large scale production.

The BCI was established to respond to the impacts of cotton cultivation. The aim of the initiative is to promote measurable improvements in the key environmental and social impacts of cotton cultivation worldwide to make it more sustainable (economically, environmentally, and socially). The BCI endeavours to initiate global change in the mass market, with long-term benefits for the environment, farmers and other people dependent on cotton for their livelihood. Better Cotton is being defined through a collaborative multi-stakeholder approach (with representatives from producers, trade and industry as well as civil society and others) that leverages the commitment of global buyers of cotton and/or cotton products to demand large and increasing amounts of better cotton.

For more information: www.bettercotton.org

Rael Cheket Limo plucks leaves on the Unilever Tea Kenya Kericho Estate, a job she has held since 2004. *Caroline Irby.*

A Unilever Tea Kenya Kericho Estate employee holds a handful of plucked tea leaves. *Caroline Irby.*

Unilever Tea Kenya redefines green tea

By ***Dresden Joswig***

Employing more than three million men and women and providing for millions more, the tea industry is of paramount importance to the well-being of Kenya and its people. To encourage an environmentally responsible and economically viable industry, Unilever – the world's largest tea company – is working with the Rainforest Alliance to improve the way its estates in Kenya, and elsewhere, manage their land. Rainforest Alliance Certified™ since 2007, the Unilever Tea Kenya Kericho Estate was the world's first tea farm to earn the distinction. With the integration of sustainable land management techniques, the estate is using fewer resources and proving to be a better neighbour to people and wildlife.

The sprawling Unilever Tea Kenya Kericho Estate, which stretches across 14,000 hectares, complies with the rigorous social, environmental and economic standards required by the Sustainable Agriculture Network (a consortium of leading conservation groups) for Rainforest Alliance certification. Unilever Tea Kenya has made a profound commitment to social, environmental and fiscal responsibility, working independently on sustainability initiatives for more than a decade.

The benefits of employing sustainable agriculture techniques extend well beyond environmental improvements.

Its Kericho estate has found outlets for selling recyclable material (an additional source of income) and has begun separating its solid waste. To improve efficiency, the estate has upgraded its tea factory furnaces, also effectively reducing its use of firewood and energy. Employees have been taught to treat factory water effluent so that it does not pollute the surrounding environment. In addition, workers use micro-irrigation systems, which require less water than many other methods of irrigation and help to minimize soil erosion.

The benefits of employing sustainable agriculture techniques – and providing third-party verification of responsible management – extend well beyond environmental improvements. Rainforest Alliance certification safeguards benefits like access to schools, health care facilities and housing on the Unilever Tea Kenya Kericho Estate. "We're very happy at the moment," says picker Rael Cheket Limo. Though she is a casual worker, Limo still qualifies for free company housing with running water and a cement floor, and her children are able to attend the estate-subsidized school.

Experience on the estate and other Rainforest Alliance Certified farms tells us that the use of sustainable management techniques is also good for business, improving productivity and often reducing costs on farms. Since it began embracing sustainable agriculture, the Unilever Tea Kenya Kericho Estate has seen an increase in crop yield. Other Rainforest Alliance Certified farms have achieved comparable results. For example, the Colombian Coffee Federation found that farmers who had earned Rainforest Alliance certification saw their productivity increase by 20%. Similarly, Chiquita's company-owned farms reduced costs by 12% and increased yield by 27% after becoming Rainforest Alliance Certified. Money netted from these developments trickles down to employees by providing for better housing, healthcare and education.

Giving farmers and producers the tools and techniques to manage their operations while conserving resources, and providing the incentive to do so, are all key to sustainability and invaluable for alleviating poverty and improving quality of life. Unilever Tea Kenya's Kericho Estate is one of the thousands of farms working with the Rainforest Alliance that has seen how sustainable farming can benefit people, wildlife and the planet.

■ **About the author:** Dresden Joswig works for Rainforest Alliance.

Backwashing of open wells in Kerala

By ***Dr. KC Bellarmine***

Accessing rain as a clean and cheap source of water has been in vogue for generations, especially amongst the poor. In Kerala a southern state in the Indian subcontinent, communities are engaging in a very simple yet efficient and economical method of rainwater harvesting.

The process of backwashing involves collecting rainwater from rooftops using a gutter or other suitable receptacles and feeding it directly to the open wells located within the premises of the household. Provision is made for a filtering device in places where there is excessive debris such as leaves, etc. The first showers are normally left to wash off the rooftops and channels; subsequent rainwater is harvested in full.

Individual households that adopt the practice get direct and almost immediate benefit by way of a rejuvenated well in their backyard. The community benefits in that it has a replenished and sustainable water table in the area. Poor people who do not own wells also benefit indirectly from the practice as a recharged well in the neighbourhood is normally shared by the community.

Prior to the project, the wells were providing 5% of drinking/cooking water, 85% of cleaning water and 15% of bathing water. A year later, the rejuvenated wells were able to provide 35% of drinking/cooking water, 95% of cleaning water and 100% of bathing water. The restoration of the well systems also meant reduced dependence on outside water.

The practice has been proven effective in Kerala, with huge potential for upscaling. Assuming a modest rainwater collection per household of 100,000 litres a year, an average initial investment Rs.1,000 ($20) and a life expectancy of 5 years, the cost of backwashing, including marginal maintenance expenses, works out to less than Rs.3 ($0.06) per thousand litres of harvested water.

■ **About the author:** K.C.Bellarmine, Ph.D. in fishing technology. He is currently with ICICI Lombard GIC Limited. The article is written in his personal capacity.

Plastic sheet used over a thatched roof to collect rain water. *Planet Kerala.*

Masonry work to collect rain water on a tiled roof. *Planet Kerala.*

PVC structure with elevated well wall to prevent overflow. *KC Bellarmine.*

Energy for a sustainable future means fulfilling demand efficiently, drawing on renewable sources. It involves providing sustainable energy services and solutions, sometimes requiring off-grid solutions or the development of more effective technologies and infrastructures to optimize energy production and consumption.

Favela Cool against Global Warming

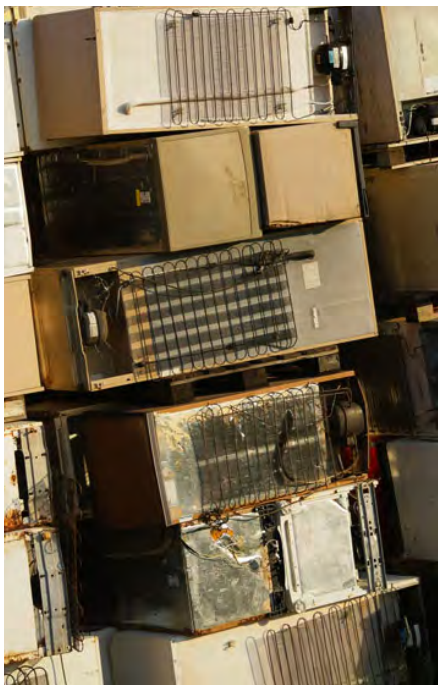
*By **Christina Gradl** and **Aline Krämer***

German appliance manufacturer BSH Bosch und Siemens Hausgeräte GmbH (BSH) has established a refrigerator replacement programme which provides fridges to the Brazilian poor for free – and makes a profit from it. How is this possible? The source of this unusual business model is legislation passed by the Brazilian government which requires that all energy providers in the country invest half a percent of their total turnover in energy-saving measures, and half of that in poor districts. To comply with this regulation, energy suppliers started to implement awareness-raising programmes about saving energy in shantytowns, or favelas, exchanged light bulbs, and finally turned to the refrigerator as one of the household appliances consuming most energy.

Currently, about 38 million refrigerators in Brazilian homes are more than 10 years old, six million are even older than 20 years. "Some fridges don't even have a door, because if you are stealing electricity anyway, you are not bothered about electricity consumption," explains Dirk Hoffmann, BSH Senior Vice President for Growth Markets Sales. The old fridges use an average of 880 kilowatt hours per year, whereas the newest BSH fridges use no more than 180 kilowatt hours.

Through the fridge exchange programme, everybody benefits: poor households get a brand new appliance and, in addition, the household reduces energy consumption tremendously, and it becomes eligible for government programmes that subsidize the energy consumption of poor families up to 100kWh. Not only does the family get a free, legal connection, it also gets an energy bill that serves as proof of residence, opening the door to other social programmes. The utilities, in turn, increase their revenues by gaining new customers and by avoiding the huge transmission losses of around 30% caused by illegal tapping. And BSH sells more fridges.

There is another beneficiary: global society, threatened by climate change. Every fridge that is replaced saves on average 210 kilograms of CO_2 emissions per year. Over the past year, BSH has already replaced over 80,000 refrigerators in the slums of Brazilian cities, cutting overall annual CO_2 emissions by 12,800 tonnes. Recently, BSH has managed to capitalize on that by getting a methodology approved for generating carbon credits with the Clean Development Mechanism (CDM). And, although BSH recently sold its operations in Brazil, the methodology and model are viable and can be replicated anywhere in the world where conditions are appropriate. We interviewed Samuel Shiroff, who led this initiative for BSH.



Glossary

CDM: the Clean Development Mechanism is an arrangement under the Kyoto Protocol allowing industrialized countries with a greenhouse gas reduction commitment to invest in projects that reduce emissions in developing countries as an alternative to reductions in their own countries.
CERs: Certified Emission Reductions are carbon credits issued by the CDM Executive Board for emission reductions achieved by CDM projects.
VERs: Voluntary Emission Reductions are carbon credits produced outside a legal framework.
CFC: Chloro Fluoro Carbons are chemicals composed of carbon, chlorine, and fluorine. They are used in the manufacture of aerosol sprays, blowing agents for foams and packing materials, as solvents, and as refrigerants. They cause depletion of the earth's ozone layer and contribute heavily to global warming.
HFC: Hydro Fluoro Carbons are chemicals composed of carbon, hydrogen and fluorine (no chlorine). They have no known effects on the ozone layer, but do contribute significantly to climate change, being up to 12,500 times as potent as carbon dioxide in global warming. They are targets of the Kyoto Protocol and a significant share of CERs are from HFCs

A family in front of their new highly efficient fridge. *BSH.*

Interview with Samuel Neal Shiroff, Project Leader, BSH Bosch und Siemens Hausgeräte GmbH

Samuel Neal Shiroff is a director in the Growth Markets department at Bosch and Siemens Home Appliances Group located in Munich, Germany. Sam is responsible for developing and implementing the business models based on the Clean Development Mechanism (CDM) of the Kyoto Protocol. BSH is currently active in this area with its new technology "Protos" plant oil cooking stove, as well as with the replacement of very old refrigerators in the developing world.

Before joining BSH, Sam was the executive director of the Bellagio Forum for Sustainable Development and represented Deutsche Bank's investment in the Prototype Carbon Fund of the World Bank.

– How did the idea to access the carbon market with the fridge exchange programme originate?

– We first started working on this idea in the context of another project, the plant oil cooking stove Protos. This is a technology we are working on for developing countries. The customers there are often very poor. One of the ways that we were attempting to provide the product at a cost that can be affordable is through carbon credits. Through Protos we had established a good working relationship with the German Development Agency, GTZ; and in our conversations we started talking about other appliances – specifically refrigerators and potential carbon credits from electricity savings and from recycling refrigerators that contain HFCs.

A typical Brazilian Favela. *BSH.*

– What role did GTZ play in the development of the carbon credit programme?

– GTZ is an equal partner in this public-private partnership which is really taking advantage of good synergies: we provide information, input and expertise as a refrigerator manufacturer that is a global leader in energy efficiency and the GTZ provides expertise on CDM as well as other development-related issues. I think there is a lot of strength in this partnership.

– How are the carbon savings calculated?

– There are the two ways to generate CERs. First, carbon saved from increasing energy efficiency is calculated as follows: Old fridge energy usage minus new electricity usage times the emissions factor times the number of years. The difference in transmission losses is also included. Second, recycling refrigerators that contain HFCs generates credits for the amount of HFCs captured.

– What is the status quo regarding the safe disposal of old refrigerators in Brazil?

– At best, the gas from the compressor is removed during the recycling. The foam is simply left to emit whatever it contains. At worst, everything is just released to the atmosphere because people take the copper off the compressors to sell it. We are moving forward to change that and establish processes through which all of the environmentally harmful gases are captured and destroyed.

– How much revenue could be generated from CFC capture?

– CFCs are not eligible for CERs because they are covered by the Montreal Protocol on substances that deplete the ozone layer, and thus not applicable for the Kyoto Protocol. Montreal currently provides no funding for the destruction of CFCs contained in old fridges. Thus these gases, which are extremely harmful for the ozone layer and the climate, are left to be released into the atmosphere because there is no incentive to capture them.

We are hoping to change this incentive by generating voluntary credits for them. But prices on the voluntary market vary - credits are simply worth what a buyer is willing to pay for them. A refrigerator may contain CFCs worth the equivalent of 3 to 5 tonnes of CO_2. To pay for the cost of recycling, the minimum price per tonne would need to be around €3 to €5. Clearly, the higher the price, the stronger will be the incentive to get these fridges disposed of in an environmentally responsible manner.

However, several additional issues complicate this area of carbon trading:

First, voluntary credits from CFC capture could really flood the market. A million fridges would suddenly generate 5 million voluntary credits, and that just from one part of Brazil. A large supply would lower the value of those credits and thus create a negative dynamic.

Second, unless a closed system comprising the entire life cycle exists, it will be unclear what gas is in the new fridge that inevitably replaced the old one. If it is an HFC, one gas with high global warming potential simply replaces another – which is far less desirable than using a climate-friendly coolant.

Third, if it becomes profitable to recycle CFC refrigerators in developing countries, this may be an incentive to ship fridges from the industrialized countries to developing countries to claim credits. This is obviously not a good idea.

– Who receives the revenues from the carbon credit sales? BSH or the utilities that purchase the fridges, or both?

– From an efficiency viewpoint it makes more sense for BSH to be the entity that manages all relevant activities. If each individual energy company sets up its own CDM department and is managing its own refrigerator exchange programme, the costs multiply many times. If BSH does it throughout a country, it is simply more efficient.

However, we are an appliance manufacturer, not a carbon credit company, and therefore, we are very flexible. If the utility wants all the credits we have no problem with that. Obviously the costs and the risks need to be shared. It is simply a matter of negotiating the best way to share all of the benefits of the project.

– How predictable are savings from fridge replacements?

– With fridge replacements, there is very little if any real behaviour change. The only potential change is that customers may no longer unplug the fridge, because with much lower energy consumption, they can now afford continuous cooling. This makes exchanging refrigerators one of the most

predictable energy savings opportunities for a country.

By contrast, if you exchange light bulbs, behaviour can change. People have less incentive to switch the light off if they are not paying as much. Low-energy light bulbs seem very effective because they are cheap and promise high energy savings. But actual savings are harder to predict and certainly harder to measure.

– Do you consider replicating the model in other regions?

– We are in a process of exploring where conditions are appropriate in other countries. Obviously it is in our interest to make governments aware of what is possible: the more refrigerators you replace with our highly efficient products, the more CO_2 savings you generate.

Here, national emissions factors play an important role: while the costs for the refrigerator, the transportation and the management are essentially the same no matter where in the world, the amount of carbon credits generated depends on the emissions factor of the country.

– Could similar incentives for fridge exchanges be created in developed countries?

– Ultimately, it is about making savings in energy and environmental costs pay for the consumer. Low electricity prices mean that consumers are often not able to recoup the additional cost of a more efficient appliance via the lower operating costs over a reasonable period of time. Thus, incentives that reward more efficient appliances – whether it is through carbon credits or tax incentives or some other mechanism – would indeed help to encourage customers to purchase more efficient appliances. BSH would certainly be very open to such incentives.

■ **About the authors:** Christina Gradl and Aline Krämer are co-founders and directors of the Emergia Institute, pursuing independent research and consulting for sustainable business solutions to development challenges.

Towards a brighter future

By ***Dorcas Cheng-Tozun***

When the sun sets this evening, about 1.6 billion people worldwide will conduct night-time work, study, cook, and socialize in near-darkness. For families without access to electricity, one of the few options for light will be the kerosene lantern, which is about 100 times dimmer than a single incandescent bulb.

Kerosene comes at a very high cost: it is both expensive – costing as much as $10 per month for dollar-a-day families – and dangerous, leading to respiratory infections and deadly fires. In addition, millions of tonnes of carbon emissions are released every year from burning kerosene.

The D.light Solata is one of the most affordable solar lamps available to households like this one in Tanzania. The light provided can enable activities for multiple family members. *Theo Steemers/D.light Design.*

One of the most significant benefits of brighter and more dependable lighting is that children and young people can study for longer hours, thus increasing the rate of learning and increasing their potential for a bright future. *D.light Design.*

For the poorest households in the world, the benefits of modern lighting alternatives are clear, resulting in higher incomes through increased productivity and improved educational outcomes for children. Lives are saved due to the reduced risk of kerosene fire and indoor pollution.

D.light Design, a for-profit social enterprise founded in 2007, is one of the key players at the forefront of providing product solutions for bottom-of-the-pyramid households. The venture capital funded company wants to replace every kerosene lantern in the world with clean, safe and bright light. The enterprise is committed to using the very best design principles to create products for the developing world, resulting in lighting and energy solutions that are appropriate, high-quality and affordable.

In 2008, D.light introduced a product line of solar-rechargeable light-emitting diode (LED) lights, the Nova Series and the Solata, that provide up to 32 hours of bright light on a full charge. The products utilize the latest and best LED and solar technology in the world, providing safe and high-quality replacements for kerosene lanterns and other hazardous or unreliable power sources.

With a retail price range of about $12 to $40, these products are among the lowest cost solar lights available in the developing world. The affordability and durability of the products ensures that more families can permanently choose to leave behind dangerous and dirty fuel-based lighting sources. The products also offer features such as AC-charging, fast-charging, voltage spike protection, and mobile phone charging. As such, they are designed specifically for the particular challenges of our customers' environments and for meeting their energy needs to enhance their quality of life even beyond lighting.

Since 2008, D.light has established sales offices in India and East Africa. The need in these particular markets is immense: about 500 million people in India alone have access to no or only intermittent electricity; the East Africa region is home to another 150 million off-grid customers. D.light is also actively partnering with diverse distribution partners throughout the world, utilizing regular market, NGO and financing channels to increase the reach of its products.

Customer response has been extremely positive, and the measurable impacts encouraging. In one village in India, all 47 households were able to purchase a D.light Nova through an innovative financing model offered by a US-based NGO partner. With a small down payment and low monthly payments, the products became very affordable for even extremely low income families. Within two months, the entire village reported an average increase in monthly household income by 50%, from $12 to $18. Families also experienced cost savings from no longer having to purchase kerosene, as well as improved study conditions and indoor air quality. Several months after the project, the repayment rate of all 47 households has been 100%.

D.light's target is to replace at least 20 million kerosene lanterns with solar-rechargeable lights by 2020. About one year after the product launch, over 200,000 lives have already been positively impacted with clean, safe and bright light. As the company continues to scale up, this ambitious target – and the large-scale change it will bring – could well be within reach.

■ **About the author:** Dorcas Cheng-Tozun is the Director of Communications, D.light Design. www.dlightdesign.com.

Off-grid Renewable Energy Solutions in Bangladesh

Grameen Shakti in Bangladesh is one of the largest and fastest growing rural based renewable energy companies in the world. It was initiated in 1996 by the core-builders of Grameen Bank in order to rescue the rural people from energy poverty which hampers their social and economic development. Inspired by the vision of Professor Yunus who has great faith in the modern technology and inherent creativity and capacity of the rural people, Mr Dipal Barua, the company's Managing Director and one of the core-builders of Grameen Bank, wanted to create a synergy between renewable energy technology and micro-credit in order to give the rural people a chance to improve their quality of life and also take part in income generating activities.

Through its innovative microcredit scheme, Grameen Shakti has embarked on an ambitious programme to provide a range of affordable renewable energy technologies to rural households. Already, more than 205,000 homes across Bangladesh have installed PV solar systems capable of powering lights and small-scale electronic appliances. Over 8,000 PV solar systems are being installed per month, and demand for the systems is increasing exponentially. The goal is to install two million PV solar systems in homes by 2011 and seven and a half million by 2015, which would reach half of the rural population of Bangladesh.

In addition, Grameen Shakti has installed 6,000 biogas plants, which convert animal dung and organic litter into biogas and slurry. The biogas can be used to cook food, for lighting and to produce electricity. The slurry is used as organic fertilizer and as fish feed. Grameen Shakti has a goal of building 500,000 biogas plants by 2015. Grameen Shakti has also disseminated over 20,000 improved cooking stoves and has the goal of providing one million stoves by 2010 covering 35,000 villages.

The employment and other socio-economic opportunities of the programme are far-reaching. At least 20,000 jobs have already been created with the current uptake of these three renewable energy technologies across Bangladesh. The goal is to create at least 100,000 jobs, mainly for women, by 2015.

Grameen Shakti is an example of a decentralized solution to clean energy for the poor, which is especially powerful as it is commercial in operation and microfinance-driven, and as it substitutes kerosene (the usual lighting fuel, held responsible for respiratory diseases) with photovoltaic electricity, biogas and improved stoves. Thus it addresses health, environment and poverty at the same time, aiming at a future where rural households of Bangladesh would have access to environment friendly and non-fossil energy at affordable costs.

Sources: UNEP (2009): Global Green New Deal: Policy Brief. (Original source: Barua, Dipal: "Bringing Green Energy, Health, Income and Green Jobs to Bangladesh." Presentation at the Preparatory Meeting, International Advisory Board to the International Climate Protection Initiative of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. Poznan, Poland, December 7, 2008).
Grameen Shakti website: www.gshakti.org.

The launch of the Programme. *Macarena Mellado.*

Access to energy and financial savings through a subsidy for efficient light bulbs

By ***Nicola Borregaard*** *and* ***Pamela Mellado***

Subsidizing water, electricity or waste collection bills for the poorer population is a common policy tool in social ministries and programmes in developing countries, especially in Latin America. With social objectives certainly paramount to these subsidies, they almost always present important conflicts with environmental objectives. Experience of progressive payments, associated with consumption that also promotes rational use, is definitely scarce. In Chile subsidies are provided for the consumption of water, electricity and waste collection. Special subsidies in the form of lump sum payments are provided to vulnerable population groups each time electricity prices rise by more than 5%.

The objective of the NLBRP was to provide incentives for improved energy use in the country's most vulnerable households by giving each home two compact fluorescent light bulbs to replace two incandescent bulbs.

With the creation of the National Energy Efficiency Program (PPEE) in 2006, the government identified different "low-hanging fruits" in the area of energy efficiency, flagging among others the topic of efficient lighting. At a time when another special lump sum subsidy for electricity bills was being prepared, the idea came up to do something different and combine social, environmental and long-term economic objectives.

The objective of the National Light Bulb Replacement Programme (NLBRP), implemented by PPEE during 2008, was to provide a new type of subsidy in the form of incentives for improved energy use in the country's most vulnerable households by giving each home two compact fluorescent light bulbs (CFLs) to replace two incandescent bulbs.

Even though other Latin American countries – such as Venezuela, Costa Rica, El Salvador, Panama, Honduras, Guatemala and Nicaragua – have developed programmes apparently similar to this one, some characteristics of the Chilean experience show how a public policy can lead to a win-win-win relationship for environment, poverty and the economy. The programme targets the most vulnerable 40% of the population, identifiable according to a Ministry of Planning register containing up to 1.5 million households, with the following aims:

- Reduce residential electricity bills by about 10% for the programme target group.
- Develop public awareness about efficient use of energy through general as well as specific information campaigns regarding energy efficiency, specifically promoting technological change at the domestic level, with the example of the light bulb.
- Contribute to sustainable development and mitigation of the effects of climate change through the reduction of greenhouse gas (GHG) emissions.
- Evaluate and implement the sale of carbon credits obtainable through the energy savings at the level of each household.
- Guarantee good environmental stewardship of the programme, including for example the collection and proper disposal of the old incandescent light bulbs.
- Take advantage of the newly introduced national labelling for energy efficient products of which efficient light bulbs were the first labelled product together with refrigerators.

Rationale

In Chile electricity is the second most commonly used energy source at household level, preceded only by liquefied gas, with expenditure of about $30 a month on average. Lighting accounts for about 27% of this electricity consumption. In 2005 80% of Chilean households used traditional incandescent light bulbs as the preferred lighting technology, with an average of 7.6 light bulbs per household. Only 20% of households were found to use at least one CFL, and there was an important positive correlation between income and CFL use. In fact, whereas in households with less than $400 average monthly income only 12% owned CFLs, this number increased to over 50% for households with more than $2,000 average income.

The NLBRP was thus directed specifically at the lowest income groups given that, on the basis of the previously mentioned data, the relatively high investment costs were considered a barrier for these income groups. The programme consisted in providing two efficient light bulbs to the 40% of the population that is most vulnerable, identifiable according to a register of the Ministry of Planning. With this subsidy an average 8% of savings in the electricity bills for the beneficiaries could be expected.

The cost of the NLBRP for the government amounted to about $4.5 million. On the benefit side, considering 500,000 beneficiary households, approximately 92.16 GWh will be saved a year, implying annual economic savings of nearly $20 million per year (for electricity at $112 per kWh), and $100 million over the bulbs' expected five-year service life.

Implementation

Information campaign

With the creation of PPEE in 2006 the government provided a significant impetus for energy efficiency, the technologies implied and the related markets, promoting energy efficiency throughout the economy. As part of the PPEE different information campaigns were implemented, directed at promoting energy efficiency amongst the general public. Efficient light bulbs were one of the emblematic technologies referred to permanently throughout these campaigns. Additionally, the NLBRP conducted its own complementary information campaign regarding the proper use of the efficient light bulbs.

Environmental stewardship

PPEE, in collaboration with Sodimac (the company awarded the contract to supply the light bulbs) and the National Association of Electricity Companies, developed a distribution and replacement plan for the CFL at the points of delivery to end-users. Each beneficiary household received a coupon authenticating them, which they subsequently handed in at the point of distribution, a procedure that also enabled the National Energy Efficiency Programme to keep track of the number of efficient light bulbs delivered. The programme also considered a plan for the collection and safe disposal of the replaced incandescent light bulbs, developed in collaboration with and financially supported by Hidronor, a waste disposal company specializing in hazardous waste. The programme certified the replacement of the two incandescent light bulbs, which are disposed of in specially designed containers, located in the retail offices of electricity utilities.

The cost of the NLBRP amounted to about $4.5 million. On the benefit side, approximately 92.16 GWh will be saved a year, implying annual economic savings of $20 million per year.

One of the first beneficiaries in the process of handing in the old bulbs and obtaining the new FCLs. *Compañia General de Electricidad.*

Use of the Energy Efficiency label
The CFLs distributed as part of the NLBRP are labelled according to the National Labelling System for Energy Efficiency introduced in 2007. Only CFLs labelled category A, the most efficient, are permitted for distribution under the NLBRP. The government thus ensures the best quality for programme beneficiaries. Over and above this label, which ensures not only energy efficiency, but also security aspects and provides a guarantee of quality, another factor that was integrated into the programme was a maximum mercury content requirement for distributed CFLs.

Use of the carbon credit market
Since the beginning of the programme the government, with the support of the Interamerican Bank for Development, has been working on implementing the sale of the carbon credits generated by household energy savings. Not only would this contribute to the programme's financial viability, but also to the image of the government as an innovator and the involvement of a large part of the population in the mitigation of a global environmental problem, thus raising the population's awareness to other related issues.

Transacted
Up to the first half of 2007 only 14% of the Clean Development Mechanism project portfolio was in energy efficiency and just 3% of those projects were focused on end-users. The NLBRP will be the first residential lighting project in Latin America and the Caribbean with a carbon credit component, underscoring the innovative capacity of Chile and its public policies. The quantitative evaluation of savings and the sale of carbon credits will keep track of and monitor the project's impact, thus contributing to appraisal of the programme as a whole.

The cut in emissions associated with the programme is estimated to amount to approximately 43.166 tonnes CO_2 equivalent a year. To trade these reductions on the voluntary market, PPEE is currently developing a public tender process. The bids received must quantify the annual energy consumption savings associated with the use of efficient light bulbs and the reduction in CO_2 emissions generated by the programme, using a widely recognized methodology. The voluntary emission reductions (VERs) generated are expected to obtain a high classification in the VERs market. The project developers participating in the bid must provide evidence of rigour in project implementation, particularly regarding measurement and monitoring mechanisms.

Conclusion
So far, throughout the implementation of the programme there have been no conflicts, scandals or noteworthy problems regarding any of the aspects mentioned.

The success of this programme is largely due to the cooperation of a large number of public and private actors, each of which played an important role in efficiently implementing specific aspects.

There are only a few technologies that can provide savings in energy consumption in the same range as domestic lighting. Bulb replacement thus appears to be a very effective way of achieving substantial gains in energy efficiency at both country and household level, combining economic, environmental, energy and social objectives, constituting a win-win-win situation that is by no means common for policy programmes.

Today, the penetration of efficient light bulbs is not only a reality for Chile prosperous population but also for the poorest households which are the beneficiaries from NLBRP. Through this programme, these households enjoy access to an efficient technology that sustains their comfort and cuts their electricity bill. The success of the programme, coupled with almost no cases of beneficiaries reselling subsidized bulbs, shows that in a medium-term perspective, social support programmes should be designed in an innovative, integrative and careful manner to consider both environmental care and poverty reduction.

■ **About the authors:** Nicola Borregaard (PhD in Land Economy, Cambridge University) is currently professor at the University Alberto Hurtado in Chile, and works as a consultant. She was Director of the National Energy Efficiency Program between 2006 and 2008. Pamela Mellado Morales (MSc Economics, University of Chile) has developed her professional career in several public institutions and currently works for the National Energy Efficiency Program as Head of the Market Development Division.

One of the images of the general information campaign of the PPEE.

Waste equates to unused resources. It calls for new infrastructure and a change in individual behaviour. In the drive to achieve resource efficiency, waste is uneconomical as well as raising healthcare and cultural issues. Above all, it is simply a waste!

Kigali transforming waste collection into pro-poor development

*By **Elise Christensen***

Kigali has a gained reputation for being one of the cleanest cities in Africa. A wide range of innovative measures in garbage collection, waste treatment, sanitation, public transport and slum development have attracted attention nation-wide, from neighbouring countries and from international organizations such as UN-HABITAT which in 2008 honoured Kigali with the prestigious Habitat Scroll of Honour award, attributed for the city's efforts to be a clean and safe place to live.

In some of the low income suburbs of Kigali – Nyakabanda, Kimisagara and Rwezamenyo – we find one of the associations that have contributed to Kigali becoming a cleaner and more environmentally friendly place. As part of Kigali's restoration of its lost glory in the aftermath of the 1994 genocide, the city council decided to form associations whose members were tasked with collecting waste and finding environmentally sound forms of disposal. The Association for the Conservation of the Environment (ACEN) is one of this initiative's success-stories. ACEN has made garbage collection into a livelihood option for more than 100 people, mostly women. The key to the success story is the transformation of garbage into an alternative energy source for the poor, fuel briquettes – and consequently providing a solution to two fundamental challenges facing the poor urban dwellers: the need for better waste management; and the need for clean and cheap sources of energy.

ACEN is today reaching out to a total of 14,000 families with the garbage collection service. The waste is brought to a central facility where sorters collect high-cellulose components such as compost, paper cardboard and wood scrap. These materials are then dried, shredded and compressed into briquettes, a cooking fuel which is significantly cleaner and more efficient than wood and charcoal which are currently the main fuel for cooking in Kigali. In Rwanda every year some 5.5 million cubic metres of wood are used for domestic cooking and heating, and more than 80% of current energy needs are met by wood. Facing the challenge of serious deforestation, the government of Rwanda aims to by 2020 reduce the volume of wood consumed by 50% through efficient use of biomass and alternative sources of fuel. By bringing 8 tons of briquettes to the market every day, ACEN makes an important contribution to reducing the use of fuel wood and charcoal for cooking.[1] In addition, it reduces the time spent by women collecting fuel wood.

It is estimated that if the production of briquettes in Kigali was scaled up to 15,000 tonnes a year it would save 86,000 cubic metres of fuel wood annually. Moreover the use of solid waste would save the municipality of Kigali $1.5 million in transport of waste and dump site costs annually, in addition to the indirect costs of leachate contamination of ground and surface waters from the dumpsites. The savings could be used to strengthen local facilities and the city's infrastructure.

The waste collection project also has immense benefits for public health. Using briquettes instead of charcoal for cooking has substantially improved the household cooking environment by decreasing smoke in homes, thus contributing to a drop in the number of respiratory illnesses. As stated by WHO close to 5% of death and diseases in Rwanda is caused by indoor air pollution, and it is women and children who suffer the most. Another health benefit is the improved sanitary conditions due to the reduction of human and animal waste in the water, effectively reducing the incidence of waterborne diseases.

According to UNEP's Green Economy Initiative 12 million people in agriculture could be employed in biomass and biomass related industries globally. ACEN is indeed part of the global effort to create green jobs. At present the ACEN cooperative creates employment for more than 130 people, more than two-thirds of whom are women, many of them widows or HIV sufferers. Increasing demand for briquettes might also create more jobs in the future as long as the briquettes are competitive with other sources of energy.[2] At present they cost less than a third of the price of charcoal.

ACEN is a clear example of how collecting city waste can have many spin-offs besides just reducing overall garbage. And due to citizens' active participation, the initiative has received overwhelming support. Quoting President Paul Kagame, the residents now proudly say: "Poverty is no excuse to live in a dirty environment.".

■ **About the author:** Elise Christensen works for United Nations Environment Programme.

1. To replace charcoal with briquettes requires an improved stove. ACEN is currently looking into how to subsidize improved stoves for poor households.
2. According to the feasibility study, if the production and sale of briquettes is raised to 15,000 tonnes a year it could create 450 jobs and support indirectly a further 1,550 jobs, making a valuable contribution to national employment.

Burning bananas

You've heard of green fuel. Now get ready for yellow as scientists have found a way to turn banana waste into a sustainable fuel source that could be relevant to many countries across Africa.

The simple, low-tech idea was developed by researchers at Nottingham University. They used banana skins to create briquettes that can be burned for cooking, lighting and heating. It could alleviate the burden of gathering firewood, the dominant energy source in many parts of the continent. This would help reduce deforestation, which makes a significant contribution to global climate change.

In some African countries, like Rwanda, bananas are an important and versatile crop, used for food, wine and beer. But experts estimate that the edible fruit makes up just a small part of what the plant produces. According to scientists, for every one tonne of bananas, there are an estimated 10 tonnes of waste, made up of skins, leaves and stems.

It was on a visit to Rwanda that Joel Chaney, a PhD student from the University of Nottingham came up with the idea of developing a low-tech approach to turn this banana waste into an efficient fuel source.

The scientists believe that banana fuel might help reduce dependence on wood as an energy source across Africa. In some of the continent's biggest banana-producing countries like Rwanda, Tanzania and Burundi, more than 80% of current energy needs are met from burning wood. This has a very damaging impact on the environment leading to deforestation which contributes to climate change. Gathering wood for fuel is also a time consuming job, mainly done by women. "In some areas wood fuel is getting depleted and you are getting deforestation. Women sometimes have to walk over six hours a day to get firewood," says Joel Chaney.

"This is a way to use waste from crops like bananas, to make them burn in a better way because loose residue most often just burns too rapidly. Imagine just putting some straw onto your fire at home. It just goes up in flames; you can't cook food over it, while the briquettes provide a way to cook food in a much better way."

The Nottingham researchers say their low-tech approach is a small step towards meeting the millennium goals and helping people out of poverty. They would be happy to give the idea away for free and are encouraging people who want to use the idea to get in touch.

Source: extract from http://news.bbc.co.uk/2/hi/africa/8044092.stm
Photo: Steven Visser

Monastery from beer bottles

Thai monks from the Sisaket province have used over 1 million recycled glass bottle to build their Buddhist temple. Mindfulness is at the centre of the Buddhist discipline and the dedication and thoughtfulness required in building everything from the toilets to their crematorium from recycled bottles shows what creativity and elbow grease can accomplish.

The Wat Pa Maha Chedi Kaew temple is about 400 miles northeast of Bangkok in the city of Khun Han close to the Cambodian border. Using Heineken bottles (green) and Chang Beer bottles (brown) the monks were able to clean up the local pollution and create a useful structure that will be a visual reminder to the scope of pollution and the potential we can make with limber minds.

The water tower and tourist bathrooms are even made from beer bottle litter. The monks were able to have the local people bring them the building materials which beautifully reflect the Thai sun.

Source: http://greenupgrader.com/4262/one-million-beer-bottles-later-and-its-a-buddhist-temple/

Fernando Nilo, Founder & CEO of Recycla Chile, - *http://www.youtube.com/watch?v=YHrryi4IR8g*

RECYCLA – Pioneers in recycling with social change

By ***Fernando Nilo***

Innovation

In 2003, a persistent social entrepreneur, Fernando Nilo, founded RECYCLA Chile, the first company in Latin America properly to recycle electronic waste such as computers, televisions, mobile phones, fax machines and scanners.

As there was no legislation in place for recycling electronic waste, Nilo and his colleagues embarked on a campaign to raise awareness of this topic in Chile. They are now working with local authorities and other stakeholders to address the vacuum through RECYCLA. The company has also entered into agreements with social organizations working to bridge the digital divide such as the Committee for Democracy in Information Technology Foundation (CDI)

RECYCLA operates through a B2B model (Business-to-Business) receiving and dismantling collected e-waste and charging a fee for the recycling services to its clients. In recent years, its partnerships with corporations (eg Epson, Hewlett Packard, Canon, Santander Bank) have been growing as companies become increasingly aware of issues around environmental sustainability and their corporate social responsibility. Our next step will be the B2C model without charging for the service to the consumers.

Toxic challenge

Why is it important to recycle electronic wastes? E-waste is of concern largely due to the toxic and carcinogenic nature of some of the substances if processed improperly, in particular lead, mercury, cadmium and polychlorinated biphenyls (PCBs).

The extreme growth rates and ever increasing obsolescence rates result in large quantities of electrical and electronic equipment being added to the waste stream. Electronic waste represents 2% of America's trash in landfills, and equals 70% of overall toxic waste.

Strategy

The challenge lies in creating a profitable e-waste management system. For example, to date, just as in Chile, none of the collective e-waste management systems in Europe - for example Sweden and Belgium – have been able to finance their operations. So their work is subsidized by local governments. They all rely on additional funds to finance certain steps in the recycling chain.

RECYCLA has set up a mechanism to receive, collect and store electronic equipment and appliances. It then classifies the equipment accordingly, separating computers, faxes, printers and so on. The components to be recycled are dismantled and separated. Hazardous waste is separated according to its level of toxicity and sent to a hazardous waste disposal centre. Non-ferrous metals including copper, aluminium, and stainless steel all follow the same process. Materials are compacted and stored in containers for export to smelters that comply with ISO 14,000 standards.

RECYCLA also ensures social and environmental transformation through working with the prison system, which involves recruiting soon-to-be paroled prisoners into the company as its workforce. Their main task is e-waste recycling which involves dismantling the electronic appliances and consolidation of the parts for export. This has enabled former inmates to be incorporated into the workplace and the society in Chile.

It also emphasizes, through its awareness programmes, the need for extended producer responsibility especially to manufacturers of electronic products, to be accountable over the entire life cycle of products and packaging introduced on the markets. They must either take back spent products and manage them through reuse, recycling or delegate this responsibility to a third party.

The triple bottom line management model is applied to bring awareness and reflect environmental and economic sustainability as well as social responsibility. Today, RECYCLA is a recognized pioneer and has won various national and international awards that have recognized its E-waste management system innovation.

Awards won by RECYCLA

- Technology Pioneer 2008, World Economic Forum
- Energy Globe Award, Prague 2009
- Best Practices Award, Dubai
- Global Social Entrepreneur Schwab Foundation 2008
- Entrepreneur of the year 2007, Chilean Government

About the authors: Fernando Nilo is President of Recycla Chile. The article has been adapted by Nahla Adel Salem and Dennis Kimera who participated in the FK Norway Youth Exchange Programme.

Workers at Recycla Chile's plant are dissembling computer monitors for recycling. *Recycla Chile.*

Recycla Chile.

Urban planning and construction are cornerstones for human habitat. Both hold enormous potential for resource efficiency, with construction currently generating a substantial share of our waste burden. To house growing urban populations the need for more sustainable cities is increasingly urgent.

Reconstruction fables

By ***Pablo Allard***

On 3 May 2008 the 5,000 people living in the small but thriving town of Chaitén, Chile, were awakened by the fierce eruption of the neighbouring volcano of the same name. Neglected by geologists and dormant for more than 250 years, the small volcano sits just 3 miles north of the capital of Palena Province, a centre for connectivity and services for the isolated communities of the Chilean Patagonia. The danger of massive pyroclastic flows or the collapse of the dome forced the authorities to evacuate more than 7,000 people from the town and surrounding area in less than 48 hours. Despite the difficulties accessing the disaster zone, there were no fatalities.

During the early days of eruption the column of incandescent ashes reached more than 12 kilometres high, covering the town and its surrounding hills with more than 60 centimetres of ash. But the disaster was not caused directly by the volcano, but by the river Blanco. Heavy rain washed most of the ash out after a few days clogging the river and forcing it to find a way through the city. The floods destroyed more than two-thirds of all properties and most of the infrastructure, including the regional airfield, while severely limiting operations in the port.

The Chilean Government responded rapidly, putting the Minister of Defence in charge of coordinating crisis management until a special authority, the Presidential Delegate on Chaitén was appointed in June, with a mandate to help displaced families with temporary accommodation and give each family a displacement bond worth about $1,000. The temporary loss of Chaitén meant that many small communities and a complete region would have to depend on Argentina to maintain communications and connectivity, access to hospitals and services, literally splitting Chile in two and posing a complex geopolitical dilemma.

The volcanic eruption deteriorated and it became clear it would last longer than expected. By late July the river had destroyed most of town, small groups of Chaiteninos were allowed to return to town simply to recover whatever was left. A few decided to stay defying the volcano and the Government's call for complete evacuation. The Government responded very well in terms of evacuation and support for displaced persons, but made no plans for reconstruction or relocation, since most of the Chaitén urban area was still subject to a high volcanic risk. In response to the call, the Cities Observatory (OCUC) – an urban and territorial intelligence unit at the Catholic University in Santiago – offered regional and national authorities its services for the creation of a special task force of more than 30 professionals that could rapidly analyse strategic scenarios and recommendations for reconstruction or relocation of the town.

Turning a catastrophe into an opportunity

The eventual reconstruction or relocation of Chaitén poses a great challenge. But it is also an opportunity for a country like Chile to develop a response policy for its many natural disasters. Instead of treating the short-term emergency response as a cost, the idea was to consider its planning as an investment. The continuous volcanic activity gave time to evaluate and consider mid and long-term scenarios while responding to disaster relief. This simultaneous vision is key if we consider Patagonia as one of the most sensitive and isolated areas in Chile and a world biosphere reserve.

Considering the geopolitical importance of the city within the region, and the visibility of its natural features, the future of Chaitén and Chilean Patagonia depends largely on the development of an eco-tourism industry, conservation, high-quality end-user services and sustainable production. Uncertainty over the future of the volcano provided a window of opportunity to define an adequate strategy, aligned with a clear development vision. Chaitén was also an opportunity to align four key issues defined by the Chilean Government as priorities for the future development of the country: territorial equality, sustainability, innovation and country branding.

This new vision could be materialized in a sustainable low-impact development that makes efficient use of economic and natural resources a priority. This issue is particularly important in the Palena Region, where most human settlements still depend on Chile's mainland for the majority of its services and provisions.

On the other hand, the small size of Chaitén allows for innovation in terms of sustainable urban planning and design. A small town of 5,000 has the right scale and components for self-sufficiency and low dependency on external services such as energy, water, waste management and goods. Its potential for replication is high, not only as a sustainable urban model, but also because it opens the way for new tools and capabilities that could allow developing countries to elaborate appropriate policies and contemporary approaches to planning small, remote towns.

By the time the Cities Observatory (OCUC) set up the task force, preliminary information showed that the level of destruction was so high that any potential scenario meant starting from zero, in terms of urbanization, infrastructure, energy provision and services. Starting from scratch lifted many

Aerial view of the town of Chaitén and its neighbouring volcano. *Stephanie Rojas, OCUC.*

Buildings – Eastgate building Harare, Zimbabwe

Efforts to improve resource efficiency in the building sector must consider construction materials and methods; energy consuming installations such as lights, fans, and pumps; and products that influence energy use, including windows and insulation.

Biomimicry principles, where nature is used as a model, were famously applied to the built environment in 1996 by architects and builders who modelled the Eastgate Building in Harare (Zimbabwe) on the self-cooling system of termite mounds. The design derived from the observation of compass termites building wedge-shaped towers that always point north. This allows the broad sides of termite mounds to capture heat in early morning and late day while the point of the wedge exposes only a small surface to the mid-day sun. All surfaces contain ventilation holes. As the air inside warms, it rises and exits through upper holes, creating an automatic draw of cooler fresh air through lower holes. The Eastgate Building uses a passive cooling system that operates on the same principles and is complemented by other features such as broad window overhangs.

Since it opened, the commercial structure with 5,600 square metres of retail space, 26,000 square metres of office space, and parking for 450 cars used an average of 90% less energy than other buildings of similar size – saving more than $3.5 million in air-conditioning costs alone.

Source: UNEP Yearbook 2009, chapter Resource Efficiency, pp 44-45.

The small size of Chaitén allows for innovation in terms of sustainable urban planning and design.

restrictions and enabled thinking to focus on a settlement for the future. The potential for exploring new infrastructure paradigms was supported by the fact that Chaitén is located next to the six priority hotspots for geothermal generation in Chile, allowing the new town to reduce its current dependence on a 60-mile high-voltage line and a diesel plant.

The task force considered three key factors to direct its work. The first goal was to preserve the community and relief workers from natural risks (volcanic eruption, flooding, earthquakes), urban (fires, short-circuits and structural collapse) and health hazards (plague, infectious diseases and respiratory problems associated with exposure to silica from ashes). Secondly it sought to preserve, wherever possible, public and private propriety, particularly that of displaced families, taking into consideration tangible and intangible values such as their history, culture and traditions. Finally, it aimed to lay the basis for the sustainable future development of the town and the region, by maintaining a simultaneous vision of emergency and long-term planning, understanding the process as the transition from catastrophe to opportunity.

Four phases of the Chaitén task force

The first phase involved collecting all available social and territorial data for a comprehensive GIS database, in order to analyse the situation and elaborate a development vision. Chaitén must be rebuilt or relocated as a city of the future, planned for the next 50 years and not simply as a replica of the existing town. It should be a thriving town, with new economic activities that could add value to the region, starting with the reconstruction process as the main driving force. It should also be exemplary for its environmental, carbon-neutral development, with a reduced ecological footprint, self-sufficiency and lower dependence on mainland Chile. It could become a prime international tourist destination, thanks to its landscape, white-water rivers, fly fishing, rich culture and the volcano itself. In short it had the potential to become a model of community participation and cohesion, working and enduring the disaster to articulate the Chaiteninos' own vision and history of colonization and dialogue with natural forces, rooted in an understanding of the restrictions and opportunities inherent in the events that drew attention to this remote land.

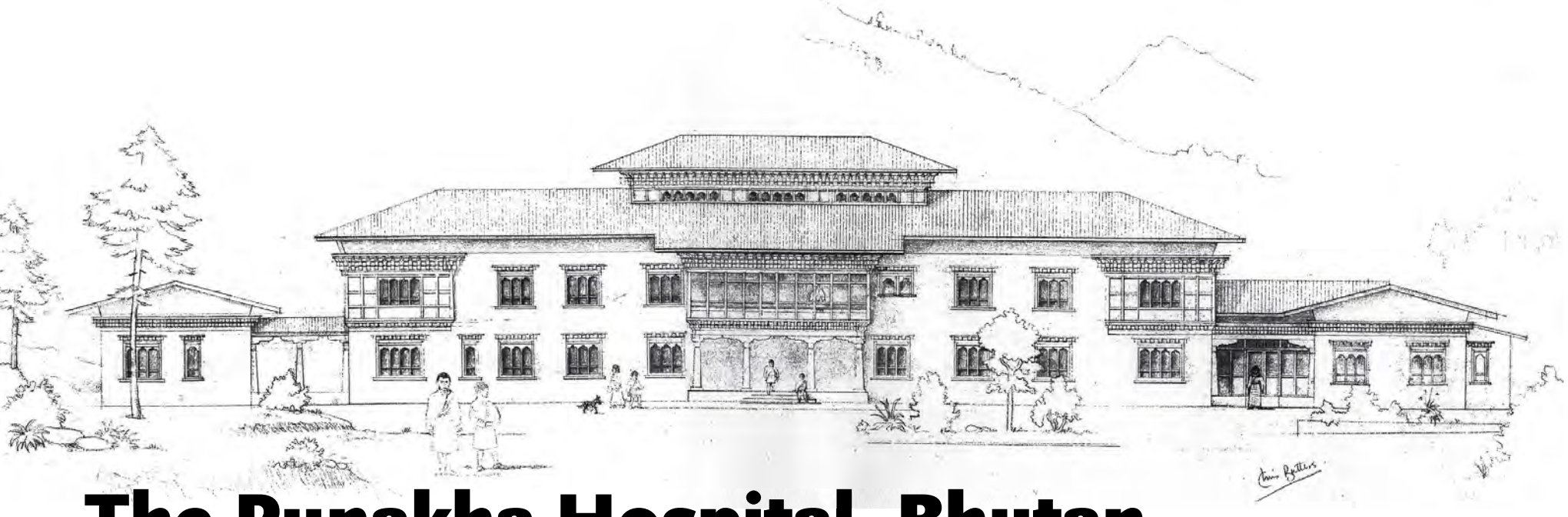
The second phase assessed the viability of reconstruction on the original site and carried out preliminary analysis of potential sites for relocation. Social and economic cost-benefit analysis of the potential for reconstruction at the original location demonstrated that the risks and costs involved were higher than for other comparable locations. Following the recommendation for relocation, the specialists from the engineering firm Arup, which had joined the task force, carried out their Sustainable Projects Appraisal Routine (SPeAR®), and developed a new methodology (MeAL®) enabling the group objectively to assess and compare five different relocation scenarios from a cost-benefit standpoint. The scenarios were presented to a special ministerial committee that reduced the potential scenarios to two alternatives.

The third phase continued with advanced evaluation of the two alternative sites for relocation, development of a design master plan and recommendations for implementation. Following the results of this analysis, and other studies by governmental agencies, the Minister of the Interior announced in February 2009 the relocation of Chaitén to Santa Barbara, 10 kilometres north of Chaitén at a site protected from the volcano.

The fourth and final phase involved presenting the work to the general public, with several meetings with the displaced communities, giving the Chaiteninos an opportunity to understand and take part in the decision making process.

When the task force completed its work in April 2009, the Ministry of Housing and Urbanism, and the Regional Government, took over the planning and construction process, developing a series of studies and actions to secure the rebirth of Chaitén as a competitive, sustainable and thriving gateway to Patagonia. Studies for a new port and construction of a new airfield in Santa Barbara are underway. Last June the President of Chile, Michelle Bachelet, visited Santa Barbara and officially opened Chaitén's new temporary municipal and police facilities. It is expected that at least a third of the original Chaiteninos will have returned to their homeland by 2011. There is still uncertainty on how much of the vision and opportunities detected by the task force can be implemented, but the groundwork has been done for the development of a national strategy for post-disaster planning. An evaluation of the socio-economic losses and damages, could allow not only Chaitén but also many other cities confronted with a disaster to rise from the ashes.

■ **About the author:** Pablo Allard (PhD) is an Architect and Urban Designer focused on integrative design of urban infrastructure in sustainable communities, with emphasis on housing, sprawl and urban renovation. Since 2005 he holds the position as Executive Director of the "Cities Observatory" www.ocuc.cl at the Universidad Católica de Chile Faculty of Architecture, Design and Urban Studies.



The Punakha Hospital, Bhutan

By ***Chris Butters***

The Punakha Hospital in Bhutan exemplifies cultural sustainability. Sensitivity to local tradition is integrated in an efficient and economical project. Traditional layout and decoration was emphasized as it has both religious and cultural significance in this Buddhist culture.

This hospital meets the medical needs of village people. It has 30 beds and services including a laboratory, pharmacy, X-ray, clinic and sections for indigenous medicines, hostel and administration; as well as staff housing. An extremely low cost of $240 per square metre was achieved.

Technologies and performance

The accent is on passive design, improved traditional building practices, natural ventilation, low embodied energy, local materials and renewable energy (hydropower, wood stoves, a little solar water heating). The project uses primarily local materials, reducing transport and embodied energy. Climate emissions are small due to use of natural materials and renewable energy. However, due to earthquake requirements, the main structure is reinforced concrete (cement is produced in Bhutan).

Heating and power are electrical since Bhutan produces hydropower. Some cooking is with wood, an abundant resource in Bhutan. There is an emergency diesel backup. But the main energy strategy was to reduce the demand side, by careful planning, climatic adaptation and appropriate construction. The hospital thus needs no air conditioning, has good day lighting, simple ceiling fans, and uses about 40% less energy than comparable buildings.

Adapting to the local context

Bhutan has a strong commitment to maintaining culture and environment, with the goal of careful and sustainable development. Their leaders have stated: Gross National Happiness is more important than Gross National Product. Traditional building with all its religious ceremonies and craftsmanship is still in practice. The project sustains indigenous architecture; not by pastiche, but by real understanding of and careful improvements to the traditional architecture.

Punakha has a hot climate. The buildings are oriented east-west to minimise solar gain. Large roof overhangs, verandas and trees increase shade. A fountain in a flower garden provides coolness. The main building has a three storey high stairwell for natural ventilation. All rooms and corridors have cross ventilation and heavy building materials to keep the building cool.

Micro-concrete roof tiles made on site from local materials were an energy and cost effective solution instead of imported galvanised iron roof sheets. The roof trusses used 50% less timber than the traditional roofs. Paints are traditional earth and plant-based pigments. Synthetic materials were avoided, reducing climate emissions and increasing use of local, natural resources.

The architect wished to use earth building, since it is traditional in Bhutan, rather than imported and energy-consuming bricks. But at that time earth construction, which is enjoying renewed interest was still seen as "primitive" and was not accepted. This shows how it takes time to introduce new concepts of environmental building. The hospital was described by international health experts as the most successful in the country, and received a commendation in the international Ralph Erskine awards in 2000. It has become a model for other hospitals in Bhutan – a sure mark of appropriate design – and has been extended in several phases since its completion in 1997.

Ecology, economy and community are the three pillars of sustainability. Whilst this project has many interesting ecological features, it is one of the few to place great emphasis on the cultural and community part of sustainability – a reminder to energy and other specialists that all three aspects are equally important.

■ **About the author:** Chris Butters is an architect and consultant for the GAIA group in Norway.

Tourism and travel are both a blessing and a burden for communities worldwide. They raise major challenges, but offer countless opportunities for social, cultural and economic development. When properly managed, environmental stress can be minimized and action can be taken to adjust behaviour and attitudes to suit a living planet.

Can tourism help save the environment?

*By **John DaSilva***

Community-based tourism is achieving greater prominence in south-east Asia, including Thailand. Once the domain of backpackers and the more adventurous traveller, community-based tourism is moving upscale and taking a greater share of the tourism market as travellers become more concerned about the environment and more interested in exploring local cultures. Despite this success, promoting community-based tourism effectively and sustainably, while ensuring it meets key environmental protection goals, faces many challenges.

Although community-based tourism can mean different things to different people, for our purposes we define it as a model of sustainable tourism in which tourism activities (such as community tours and home stays) are developed and operated by local residents who invite guests into their homes and communities to learn and experience true local culture and local wisdom. Integral to this model is the allocation of resources to the community members to increase their standard of living and assist in the protection of their natural environment and cultural heritage.

The Kenan Institute Asia (K.I.Asia) started working with local communities in Thailand's Phang-nga province just after the 26 December 2004 tsunami devastated the area. With funding from multiple donor sources, K.I.Asia designed a programme with two key goals: protect the environment by empowering local communities to become custodians of their environment and natural resources, and ensure that revenues generated by tourist visits reach these communities as an incentive to protect these resources. Donors supporting this effort include the United States Agency for International Development (USAID), the United Nations World Tourism Organization (UNWTO), the European Commission (through Thailand's Bank for Agriculture and Agriculture Cooperatives), Merck Pharmaceutical, the William R. Kenan Jr. Charitable Trust and the Bush-Clinton Fund. Although the programme has been successful, it has taken a number of years and several hard lessons to achieve this success.

Community guide shows off her mussels on the Ta Din Daeng community based tour. *Nipon Riabriang/ Kenan Institute Asia.*

Case Study of Ta Din Daeng village community tour

The case of the Ta Din Daeng village community tour illustrates the challenges faced in supporting and promoting such activities.

To guide community-based tourism development to a more sustainable level, the project team worked with UNWTO, Thailand's Ministry of Tourism and Sports and local organizations to complete two Tourism Management Plans for Ta Din Daeng village and the neighbouring national park using a participatory approach. These plans analyse land and sea biodiversity assets, social, cultural and economic factors, tourism potential and relevant laws and regulations. Using this analysis, local stakeholders worked together to create tourism destination action plans. Specific activities and development projects, such as a diving training centre and an ecotourism activity centre, have been designed. The environmental and social impacts of the activities have been identified and mitigation plans are now being adopted. To manage and monitor the implementation of these plans and provide guidance on how tourism can be developed, Destination Management Organizations, consisting of relevant tourism stakeholders (including representatives from the national park system, tourism operators and local officials), are being created.

The community tour takes place in and around the fishing village of Ta Din Daeng. The village has approximately 120 families and 390 residents, over 90% of whom are Muslim. During the tour, community members give tourists a comprehensive look at traditional village life through the eyes of the villagers. Along the journey, visitors are introduced to a variety of community activities, such as shellfish aquaculture in floating pens, and they learn about hydroponic growing activities and eat a traditional lunch with the villagers. Visitors also participate in the creation of batik products and actively help preserve a mangrove forest by planting new mangroves.

Though the tour is now ready for full operation, it took nearly two years of continued effort to reach this point. Bringing together local communities, government and business owners (especially hotel and tour operators) was the first challenge faced by the project team. Phang-nga has been fortunate in that its local government is very interested in promoting sustainable tourism and avoiding models of development that have destroyed (or are destroying) other tourist resorts in Thailand, such as Pattaya and Koh Samui. This local government support has made it easier to stop harmful development and enabled local communities to better work together to promote environmental protection and sustainable use of natural resources. The project team reinforced cooperation in developing community-based tourism through formal memorandums of understanding (MOU) between communities and tour operators, in which local communities will keep 70% of the tour fees. This commitment with the private sector has created a true partnership that is enabling resources from tourists to be transferred to communities through community-based tours, home stays and the sale of local crafts and agricultural products to tourists, hotels and restaurants. This resource transfer gives local communities a vested interest in protecting their natural environment. A critical aspect is that government backing of the MOUs was provided to ensure that community rights are protected and a fair amount of the income from tour activities remains with the community.

Another key challenge was the development of community-based tourist sites that tourists would actually enjoy visiting. Initially, there was a discouraging disparity between the perceptions of local communities and the true needs and interests of tourists as shown in early test tours. Making matters more difficult, community members began losing their initial enthusiasm because tourism money was slow to arrive in the village and the level of sustained effort required to attract tourists was proving higher than expected. However, by remaining diligent, conducting market surveys and adjusting the tours by improving home stay conditions, offering more local products and activities for tourists (such as batik painting), improving the food, and providing better English signage, community revenues began to pick up. In Ta Din Daeng, since the tour began operation, it has raised village incomes by approximately 9% per year – though as the tour only operates during the six-month tourist high season, rises in income levels are clustered around these months. Projections for next year are for a rise in income of a further 20% when tour operations begin in earnest with tour operator support.

Benefits

The net results of these activities have been significant and encouraging. Local communities have established community-based tourism committees that not only focus on facilitating tours, but also on protecting the natural environment of tour destinations. Communities have made significant contributions to protecting and replanting mangrove forests damaged by the tsunami. Community forests, ignored or exploited for short-term economic gain in the past, are now being protected and used to attract tourists, as well as to cultivate forest delicacies such as mushrooms. Community members now work closely with the Kao Lum Pee – Hat Tai Muang National Park to protect coral reefs from damage caused by fishermen and uneducated divers. They also conduct a yearly reef-cleaning dive in which divers from the community, including diving instructors from local dive shops and diving tour operators, participate in the clean-up.

In Ta Din Daeng, the village community has been actively planting trees to help sustain the forest environment, with an additional 48 acres of forest planted since the project began. The Ta Din Daeng tour also includes a visit to Thai Muang beach, part of the national park which runs through the village, to study and promote the protection of the endangered Leatherback Turtle which lays its eggs there. Previously, poaching of turtle eggs was a problem on the beach as the park rangers do not have the resources to monitor the area. Now, the community has a vested interest in helping the national park rangers to monitor and protect not only the turtle eggs but also the incredibly ecologically diverse swamp forest located behind the beach, where a nature walk has been created as part of the tour.

Although community-based tourism is suffering along with all tourism from the global downturn in travel, it is clear that communities in Phang-nga are committed to this effort for the long term and have shown renewed enthusiasm in protecting and nurturing their natural environment.

About the author: John DaSilva is the Project Development Manager for Kenan Institute Asia, a Thailand based NGO operating in the Greater Mekong subregion providing sustainable development services in tourism, business and economic development, public health and education.

Guests create batik designs with some help from local villagers on the community based tour through the Muslim village of Tah Dindaeng. *Nipon Riabriang/Kenan Institute Asia.*

Tourism – Green Passport: holidays for a living planet

The Green Passport introduces to tourists simple ways to make every holiday a more sustainable activity. It's about tourism that respects the environment and culture and supports the economic and social development of local communities. For every stage of a holiday – from the choice of destination, through how to plan the trip, getting there and moving around, relating to the host community and its surroundings ecosystems, and up to the choice of souvenirs, the trip home and subsequent moves – the Green Passport sheds light on how holiday decisions can make a difference. Through informed choices such as travelling light, tourists can reduce their carbon footprint and contribute to combating climate change.

The Green Passport is an international campaign but, when implemented at a local level, its communication material is adapted to the peculiarities of the given destination. Its website has been developed in English, French, Portuguese, Greek, and soon in Spanish, German, and Chinese. Its hardcopy version was launched in English and Spanish in June 2009 at the World Environment Day celebrations in Mexico. The Portuguese version of the guide, as well as radio and TV spots, was launched in Brazil in July. Specific Green Passport travel guides for Costa Rica and Ecuador are expected to be launched by the end of 2009.

The internet-based Green Passport campaign has already been established as a reference point for responsible travellers. Its message has been spread and multiplied by the mass media in all countries where the campaign has been launched through different communication channels, such as TV and radio interviews, around 90 news articles, travel blogs and podcasts. Recognizing the communications value of the Green Passport, the European Commission decided to promote it to European stakeholders and to consider scope for translating the Green Passport into as many languages as possible. For more information: tourism@unep.org, ww.unep.org/greenpassport

Children from the Reed Valley School taking part in the 3C progamme by planting trees. *Amakhala Game Reserve.*

Children from the Isipho Aids Centre's afternoon programmes showcasing the vegetables from the Centre's veggie garden, established in part through the Amakhala Foundation. *Amakhala Game Reserve.*

Reducing poverty and conserving nature through responsible tourism development

By ***Sarah Van Mill***

Located in the Amakhala Game Reserve in the Eastern Cape of South Africa, the Heritage Collection is a group of five businesses – four of which are certified by Fair Trade in Tourism South Africa – that epitomize sustainable tourism in action through their commitment to biodiversity, education, business development, training and local procurement.

Tourism is often considered a sector well suited to poverty reduction due to its labour intensive nature, its dependence on natural and cultural resources (which marginalized people often have access to), the diversity of the sector (which facilitates wide participation including that of women), and the necessary proximity of the customer to the producer (which creates opportunities for formal and informal linkages such as producing and selling curios). Many of the aforementioned opportunities are lost, however, when workers are untrained, unfairly paid and overworked, and when the environment and local culture are not respected. Fair Trade in Tourism South Africa (FTTSA), a pioneering non-profit organization that promotes responsible tourism development through a range of activities including the world's first, and still only, tourism Fair Trade certification programme, seeks to ensure that the people whose land and resources are used for tourism activities actually benefit from tourism.

An example of FTTSA's principles in action is the Heritage Collection, a group of five businesses in the Amakhala Game Reserve of South Africa – four of which are FTTSA-certified. The Amakhala Game Reserve began in 1999 as a joint venture between six families who sought to return marginal farmland to its natural state by reintroducing a variety of flora and fauna, including the so-called Big Five (rhino, elephant, lion, leopard and buffalo). Since 1999, the businesses have contributed significantly to conservation, local economic development, social uplift and gender equality. To date, the reserve has created over 107 jobs, 87 of which are for local people. Approximately 80% of these jobs are held by black people and about 60% by women. In cash wage terms, the annual injection into local households is over US$300,000. These are significant achievements, as historically most jobs in the area were for men, because of the predominance of farming. And this success is due to the commitment of the companies to local economic development through the development of local skills.

Initially, a shortage of local businesses proved to be an obstacle to local procurement, a key tenet of responsible tourism, but the Collection have increased their local procurement by investing in local businesses. For example, a local woman wanted to start up a small business doing laundry for one of the lodges. The owners not only agreed to support her micro-enterprise, but also lobbied the other Collection lodges to do the same, resulting in a new, woman-owned local business.

Similarly, specialized skills such as guiding and cooking are scarce in the area and would typically be sourced externally. To reduce external recruitment of labour, the Collection reached an agreement with a guide trainer to establish a tourist guide training school especially for locals. The first of its kind in South Africa, the three-month Ulovane Environmental Training programme has created a pool of local black trainee guides who would otherwise struggle to find employment.

Lodge owners also minimize the environmental impacts of tourism through a self-imposed one bed per 50 hectare limit on lodge development – developed and agreed upon based on the number of beds per hectare needed to ensure commercially viable businesses, the amount of land contributed by each of the original land owners, and the desire to ensure a minimal carbon footprint. The reserve also utilizes an Off-Road Impact Index (ORI) that minimizes tourist density and environmental impacts. The ORI is completed daily to determine the potential vegetation damage caused by game drives. Depending on rainfall, road conditions, and soil and vegetation type, rangers may be prohibited from driving on certain roads at particular times.

The Amakhala Conservation Centre links conservation, tourism and education, and enables local children to experience the reserve and learn about conservation and tourism. Awareness-raising initiatives conducted for staff, their families and the surrounding communities include participation in World Water Day, World Environment Day and World Arbour Day. The Centre also funds a tree planting initiative – 3Cs (carbon, community, conservation) – which has resulted in the planting of 500 indigenous trees since 2006.

Through their commitment to sustainable development and Fair Trade in Tourism principles, the Heritage Collection proves that tourism can meaningfully contribute to poverty reduction and conservation.

■ **About the author:** Sarah Van Mill is Research Intern at Fair Trade in Tourism South Africa.

The Partnership for Global Sustainable Tourism Criteria

The Partnership for Global Sustainable Tourism Criteria (GSTC Partnership) is a coalition of more than 40 organizations working together to foster increased understanding of sustainable tourism practices and the adoption of universal sustainable tourism principles. The Partnership was initiated by the Rainforest Alliance, the United Nations Environment Programme (UNEP), the United Nations Foundation, and the United Nations World Tourism Organization (UNWTO). These criteria are the minimum standard to which any tourism business should aspire, in order to protect and sustain the world's natural and cultural resources while ensuring tourism meets its potential as a tool for poverty alleviation.

To develop these criteria, over the course of nearly two years the partnership consulted with sustainability experts and the tourism industry and reviewed more than 6 0 existing certification and voluntary sets of criteria already being implemented around the globe. In all, more than 4,500 criteria were analyzed and the resulting draft criteria received comments from over 2,000 stakeholders. Since the launch of the criteria in October 2008 the GSTC Partnership has focused on engaging all tourism stakeholders – from purchasers to suppliers to consumers – to adopt the criteria. To facilitate this, the partnership is developing educational materials and technical tools to guide hotels and tour operators through the process of implementing sustainable tourism best practices.

Since the Sustainable Tourism Criteria were introduced, they have progressed from theory to practice as major player in the tourism industry, and have been applied in projects such as:

- Travelocity launched a Green Travel Directory in January 2009, featuring third-party certified hoteliers that are aligned with the criteria.
- The International Hotel & Restaurant Association launched a new sustainable hotelier recognition programme, Emeraude Hotelier, based on the GSTC
- The German Sustainable Development Cooperation Agency, in cooperation with Rainforest Alliance and others, is financing a project to build capacity among small tour operators in Latin America to align themselves with the criteria.
- The Egyptian government, with assistance from a host of German allies including EcoTrans, launched a new eco-label in December 2008 called the Green Star Hotel Initiative that is aligned with the criteria.
- The Inter-American Development Bank (IDB) launched a sustainability scorecard based on the GSTC to guide its large scale investment decisions in tourism projects in Latin America.

And the city of San Francisco and 172 other cities endorsed the GSTC as the minimum guidelines that lodging and tour operators should adhere to during the 77th Annual Meeting of the United States Conference of Mayors.

The GSTC have also been approved as the primary input for the Sustainable Tourism Stewardship Council, an umbrella organization that will set universal minimum standards for certification programs and accredit those that meet them. This will be a critical component to ensure credibility to the use of the GSTC.

For more information: **www.sustainabletourismcriteria.org**.

Framework building prepares the ground for change, a task in which governments and international organizations play a key role. The emergence of public-private partnerships over the past decade has amply supported such efforts. Non-governmental organisations and research enhance ongoing processes with essential intellectual input.

The Marrakech Process: building resource-efficient economies and sustainable societies

*By **Maria Solis** and **Nis Christensen***

The current global financial crisis, multiple environmental threats and the continued global poverty challenge have brought forward the global need to adopt more sustainable consumption and production patterns to move towards low-carbon lifestyles and green economies. Food, energy, and water are under increasing pressure as the global population is projected to increase by 42 per cent between 2008 and 2050 and resource-intensive consumption patterns rapidly expand across the world. At the same time, a third of the world's population now lives in water-stressed regions and one out of seven people is chronically hungry. The impact of these interlinked crises, reflected in the volatility of fuel, food and energy prices, may seem diminished in the short term due to the economic slow-down. However, the global community is coming closer to a consensus on the need for collective action to seize this historical opportunity to build sustainable societies.

The Marrakech Process and Green Economy's mission

"Decoupling" or radically de-linking economic growth from environmental degradation holds the potential to turn the current crises into an opportunity to radically change towards sustainable lifestyles and a green economy. To support this goal, UNEP is centrally involved in two global initiatives: the Marrakech Process on Sustainable Consumption and Production (SCP) and the Green Economy Initiative.

Responding to identified needs and priorities on SCP, the Marrakech Process promotes the implementation of SCP patterns in close collaboration with local authorities, representatives of the civil society, and the seven Marrakech Task Forces. These are voluntary initiatives led by governments on specific SCP themes (see figure). So far, seven Task Forces have been created.

The Task Forces are carrying out a range of activities such as: an eco-label project in Africa; national action plans on SCP; capacity building to promote sustainable public procurement; projects and networks to encourage more sustainable products; tools and strategies for sustainable tourism, policy recommendations on sustainable buildings focusing on energy efficiency; promotion of sustainable lifestyles, development of guidelines on education for sustainable consumption, etc.

The Marrakech Process is also an important building block for an international agreement on SCP within the UN Commission for Sustainable Development negotiations in 2010-11 and strives to highlight SCP in the international agenda.

The Green Economy Initiative complements the Marrakech Process by promoting a new economic development model based on a green industrial revolution. It is supported by evidence of the income generated, jobs created and poverty reduction achieved through investing in green industries and technologies.

This article focuses on how the Marrakech Process can contribute to advancing the Green Economy objectives via concrete projects and initiatives. It is not intended to be a comprehensive account of the two processes but rather attempting to suggest commonalities and how they go hand in hand.

Concrete steps towards the three main objectives of a Green Economy

The overall message of SCP and resource efficiency is not necessarily about consuming less but rather about consuming differently. It is about doing more with less by creating a better quality of life while minimizing the use of energy, natural resources, toxic materials, and emissions of waste and pollutants throughout the lifecycle of products and services (its design, manufacturing, use, waste and recycling). Initiatives on SCP and resource efficiency are helping to green existing industries and link new initiatives to economic development through green investment and green jobs. Some examples of how the Marrakech Process is contributing to these objectives are highlighted below.

Revive the world economy, create employment opportunities and protect vulnerable groups

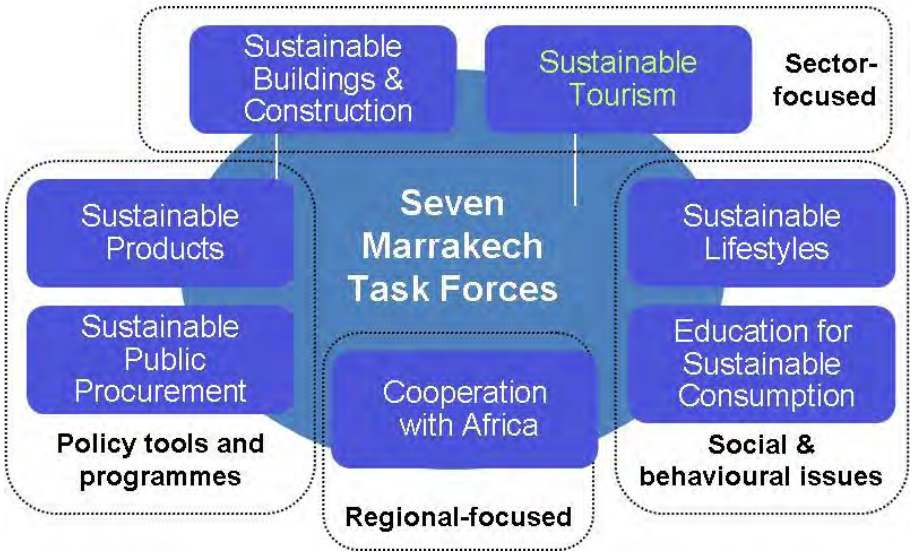
Agriculture is the largest employment sector in the world. This sector is extremely vulnerable to climate change but also a major contributor to it. Introducing resource-efficient and sustainable agricultural practices can help reverse this trend while creating new jobs. Organic agriculture, for instance, is a very labour-intensive industry. UNEP supports the elaboration of policy frameworks to facilitate conversion to sustainable farming and promote resource-efficient technologies and practices.

Improving the energy efficiency of buildings and construction is one of the areas with the highest potential for reducing greenhouse gas emissions and creating jobs. Buildings are responsible for 30 to 40% of all energy use, greenhouse gas emissions and waste generation. Through the Marrakech Process, UNEP is organizing workshops back-to-back with major international events such as UNFCCC meetings to encourage governments to invest in energy-efficient buildings. The Marrakech Task Force on Sustainable Buildings and Construction is currently looking to develop a checklist for decision-makers not familiar with challenges and opportunities for sustainable buildings and construction.

Tourism is one of the world's fastest growing industries and an important source of foreign investment and employment for many countries. However it is also an industry that places heavy pressures on natural systems and leads to the consumption of large amounts of energy and other natural resources. The Marrakech Task Force on Sustainable Tourism and Development launched the internet-based Green Passport Campaign in 2008 to promote environmental protection and cultural preservation through ecotourism, which has a high potential for creating green jobs. The Green Passport has been broadly disseminated in various languages through national tourism networks, including local tourism boards and tour operators. The Task Force also launched the Raising Awareness on Tourism and Climate Change programme, which provides capacity-building assistance to emerging economies through education, information exchange, and promoting awareness of linkages between climate change and tourism.

Reduce carbon dependency, ecosystem degradation and water scarcity

Understanding the impact of our consumption choices is a vital part of securing a sustainable future for all. UNEP is supporting the Education for Sustainable Consumption (ESC) initiative. Through this effort, UNEP, in concert with UNESCO, the Italian Government and academics, has developed Here and Now, Education for Sustainable Consumption, a compilation of guidelines and recommendations to provide policy makers with an instrument to understand the importance of ESC in supporting other policy goals, such as citizenship and democratic participation, environmental protection, or energy and climate policies. This tool has been very useful in projects such as "sister classrooms" in Costa Rica designed to integrate ESC into primary schools and share experiences between schools.



The Marrakech Task Force on Sustainable Lifestyles launched The Global Survey on Sustainable Lifestyles (GSSL) to identify how young people from different cultures worldwide perceive sustainable lifestyles. The GSSL has been disseminated in 10 languages and has attracted 8,000 participants from more than 20 countries from all the continents. Forums and video conferences with university students worldwide have been organized and contribute to build a Global Network on Sustainable Lifestyles.

Emerging economies in particular have demonstrated a strong interest in Sustainable Public Procurement (SPP) as a tool for promoting more sustainable societies. UNEP has initiated a project entitled "Capacity building for SPP in developing countries" that promotes the implementation of SPP through the testing of a methodology developed by the Marrakech Task Force on SPP in six pilot countries (Costa Rica, Mexico, Tunisia, Mauritius, Chile, and Uruguay). Regional training workshops on the Task Force on SPP Approach were organized in Paris and in Santiago in 2009 targeting a pool of 50 experts from over 20 countries. An awareness workshop on SPP, attended by 25 representatives from various Arab countries, was also organized in Cairo in coordination with the League of Arab States. The goal is for 14 countries to test the SPP approach before 2011.

Support the Millennium Development Goal of ending extreme world poverty by 2012

Mainstreaming SCP and Resource Efficiency into development strategies provides an essential contribution to the achievement of the UN Millennium Development Goals. Policies and actions such as the ones described above can serve to bolster poverty reduction efforts by creating new sustainable markets and jobs, thus reducing future environmental costs as well as increasing resource efficiency. It is also important to mainstream gender considerations into development strategies. Women benefit significantly from the creation of green jobs and the revitalization of the economy as they are one of the groups most affected by poverty and unemployment. A gender-sensitive approach is also critical in promoting Education for Sustainable Development.

Developing countries have the opportunity to leapfrog the costly and polluting phases of development by jumping straight to a sustainable development path and a better quality of life, avoiding the less resource-efficient, more polluting and ultimately more costly development path followed by industrialized countries. Towards this end, the Marrakech Process's Cooperation with Africa Task Force will be supporting the implementation of sustainable consumption and production in the region. For example, the African 10-Year Framework Programme on Sustainable Consumption and Production was launched in 2006 in attendance of high-level representatives of African countries and has been endorsed by the African Ministerial Conference on Environment (AMCEN). The 12th Session of AMCEN adopted the Johannesburg Declaration on Environment for Sustainable Development in Africa, which requests the African Union to work with all relevant stakeholders on the development and launching of an African Eco-labelling Mechanism. National SCP programmes have been developed by Tanzania and Mauritius and local SCP programmes have been developed by Maputo, Mozambique and Cairo, Egypt.

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For more information on the Marrakech Process please visit www.unep.fr/scp/marrakech or contact the Marrakech Process team at unep.tie@unep.org. For more information about UNEP's Green Economy, please visit www.unep.org/greeneconomy.

Leapfrogging is a term used to describe the possibility for developing countries of bypassing inefficient, polluting and ultimately costly phases of development by jumping straight to sustainable human development and a better quality of life. In other words, leapfrogging avoids many of the phases that industrialized countries have gone through.

For example, leapfrogging is seen in the use of solar energy in rural areas where energy sources were previously unreliable or limited. Access of poor farmers to mobile phones is another type of leapfrogging. This form of communication technology enables farmers to access information about the market value of their crops, enabling them to create better trade opportunities.

Sustainable consumption: a fairer deal for poor consumers

By ***Sonja Vermeulen***

A version of this article appeared as an IIED briefing in January 2009

On our finite planet, the dictates of ecology and technology limit economic growth. Yet a key element of this issue – consumption – has until recently hardly figured on policy agendas. Now there is growing recognition that transformation towards a low-carbon, resource-efficient economy means tackling consumption as well as production. Governments and businesses are beginning to make concerted, if uncoordinated, efforts to reduce energy and resource use. Rethinking consumption could, however, drive an even bigger wedge between rich and poor. Any new agenda for consumption needs to factor in equity as well as environmental benefit.

Summary

- World consumption is highly skewed, with the poorest people consuming the least and the richest as much as ten times more food and energy per capita.
- There is huge scope to manage global consumption. Evidence shows that well-being can be delinked from consumption, economic growth delinked from rising resource use, and local development delinked from international trade.
- Initiatives to tackle overconsumption also need to deliver a fair deal to poorer people who consume little, guaranteeing a decent basic level to all.
- Consumption needs to be understood as a social issue, not just an environmental issue, with renewed emphasis on inclusion of the world's poor majority, and collective decisions over individual consumer choices.

Fair share: the overlooked challenge in consumption

Just over a decade ago, inequity in global consumption was the focus of the UN Development Programme's 1998 Human Development Report, Consumption for Human Development. It showed that the world's richest fifth consume 45% of all meat and fish, and the poorest fifth 5%; that the richest fifth use 58% of all energy, and the poorest fifth less than 4%; and that the richest fifth own 87% of the world's vehicles, while the poorest fifth own less than 1%.

These contrasts apply as much within as between countries. In Brazil, for example, the wealthiest use 18 times more energy than the poorest in a year.

Today, consumption is firmly back on the agenda. The UN-coordinated Marrakech Process, which supports sustainable consumption and production through targeted advice, technical assistance and other means, has been increasingly active since 2003. National governments are turning rhetoric into legislation. China, for example, introduced the Circular Economy Law in 2008; its ambitious goal is to increase resource-use efficiency tenfold.

But amid the renewed attention to solving problems of over-consumption and "mis-consumption" (consumption of environmentally damaging products) is a worrying reticence regarding equity issues. Around 80% of the world lives in poverty, surviving on less than $10 a day. For them, the need is to consume more, not less. So is it possible to reduce global overconsumption – to transform to a low-carbon, low-material, low-water economy – in ways that do not penalize poor people, but create opportunities for them to raise their standards of living?

Consumption, well-being and sustainability

Our current global economic model is predicated on the assumption that higher consumption, driven by economic growth, begets greater well-being. Supplies of natural resources drive any rise in consumption, but increasingly also limit it. With climate change threatening to dampen economic growth and the UN predicting a global population of 9 billion by 2050, policymakers must question whether consumption and well-being can rise indefinitely.

Evidence shows that poorer people do indeed benefit from higher incomes and associated boosts in consumption, but that at higher income levels, the connection between greater consumption and greater well-being dwindles. The links between consumption of different resources and their environmental impacts, such as pollution and depletion, are difficult to quantify. As a result, consumer campaigns often target high-visibility rather than high-impact areas of consumption (such as air-freighted vegetables and low-energy light bulbs, rather than road transport and household insulation).

A key question for national policymakers is whether and how economic growth can be decoupled from material consumption and its environmental impacts. Examples of "relative decoupling" – reducing increases in environmental impacts relative to economic growth – can be identified. For example, in 2006-7 India delivered a GDP growth of 8% with only 3.7% growth in its total primary energy consumption. On the other hand, "absolute decoupling" – increases in economic growth alongside actual reductions in material consumption and environmental impacts – are technically and economically possible, but have not yet proved feasible in terms of policy.

Consumption, trade and development

It is often argued that low-income countries benefit greatly from trade with high-value markets such as the European Union and the United States. But how accurate is this view? If wealthy nations reduce their consumption – and by implication, their trade – will this have a significant negative impact on the world's poorest?

A look at the pros and cons of trade shows that this is a complex area. Trade does bring benefits. It stimulates changes to national, regional and local economies. Prices shift for local goods that can be produced more cheaply elsewhere and the values associated with skilled labour often increase. Opportunities arise to upgrade skills and technology, with spill-over benefits for the broader economy.

There are, however, also risks. One is that industries in some exporter countries will be outcompeted by more efficient businesses elsewhere. Supply chains within liberalized economies become increasingly buyer-driven. In the agrifood sector, for example, retailers demand that suppliers meet requirements of scale, quality, safety and packaging, which can exclude the smallest and poorest producers.

Leading thinkers now challenge the assumption that trade will bring automatic trickle-down benefits for development. It is an open question whether trade with the richest benefits the poorest. A sharper focus on regional trade and value-addition, backed by strong development strategy, may help poor people secure their livelihoods while decreasing their reliance on consumption in rich nations.

A new politics of consumption

International discussion round consumption continues to emphasize voluntary, individual consumption choices. To date, a variety of public and private policy initiatives have aimed to change the consumption patterns of individuals by encouraging domestic energy efficiency, locally grown food and bicycle transport, for example. But there are three important limits to the possible impacts of individual lifestyle-based solutions.

First, consumers' individual choices are limited by infrastructure, such as urban design centred on car use, or by policy trade-offs such as the need to balance food safety against food waste. Secondly, we buy not raw materials but goods and services, derived from complex value chains that are difficult to understand or influence. Finally, at least a quarter of global consumption cannot be attributed to household end-users, which reveals the importance of government procurement and public policy.

In seeking solutions to overconsumption, we need to concentrate on societies and structures as a whole, rather than their individual actions. Shorter-term solutions may rely on improving efficiencies within existing modes of production and consumption (reformist changes). In the longer term, however, what is needed is a re-think of how and what we consume (transformist changes). Either way, real shifts in patterns of consumption will challenge ideals of maximum individual choice. Instead, we will need collective "choice editing", and to consider seriously emerging recommendations of per capita quotas for carbon, water, meat or ecological footprints.

Critical too is providing a fair deal for poorer consumers. The 1998 Human Development Report suggested overarching principles to guarantee a basic level of consumption for everyone while reducing the negative impacts of global overconsumption. While many governments have subsequently acted to reduce overconsumption at the national level, there are far fewer examples of initiatives that explicitly link the overconsumption of the wealthy to the underconsumption of the poor, to provide incentives for redistribution of consumption patterns.

The opportunities, however, are tremendous. Governments and businesses have yet to take advantage of the bounty of easy wins where environmental gains and long-term savings in cost converge. Delivering a fair deal to poorer consumers requires careful use of pricing mechanisms as a means to reduce consumption, so as not to exclude them from access to goods and services. Pro-poor enterprises also need support to cover the initially capital-intensive and carbon-intensive investments that will allow them longer-term resource efficiency, such as construction of major new mass-transit infrastructure.

A global agenda for tackling consumption must incorporate the ideas and agency of the world's poor majority. We need to move beyond Northern agendas to recognize inequalities among people and not just among countries – and to return the emphasis firmly to collective decisions rather than individual consumer choices.

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The young generation and gross national happiness, Bhutan. *Pandida Charotok, PEI.*

The Happy Planet Index 2.0: Why good lives don't have to cost the Earth (2009), by Abdallah, S et al

"Economists like the concept of efficiency, and the Happy Planet Index is the ultimate efficiency ratio – the final valuable output divided by the original scarce input," Professor Herman Daly, University of Maryland.

In an age of uncertainty, society globally needs a new compass to set it on a path of real progress. The Happy Planet Index (HPI) provides that compass by measuring what truly matters to us – our well-being in terms of long, happy and meaningful lives – and what matters to the planet – our rate of resource consumption. The HPI brings them together in a unique form which captures the ecological efficiency with which we are achieving good lives.

This report presents results from the second global HPI. It shows that we are still far from achieving sustainable well-being, and puts forward a vision of what we need to do to get there.

The current economic and ecological crises have discredited the dogmas of the last 30 years. The unwavering pursuit of economic growth – embodied in the overwhelming focus on Gross Domestic Product (GDP) – has left over a billion people in poverty, and has not notably improved the well-being of those who were already rich, nor even provided us with economic stability. Instead it has brought us straight to the cliff edge of rapidly diminishing natural resources and unpredictable climate change. We need to see this current crisis as an opportunity. Now is the time for societies around the world to speak out for a happier planet, to identify a new vision of progress, and to demand new tools to help us work towards it. The HPI is one of these tools.

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Poverty Environment Initiative in Asia-Pacific

*By **PEI Asia Pacific regional team***

Around 641 million people – two-thirds of the world's poor – still live on less than $1 a day in the Asia-Pacific region despite it having the world's fastest growing economy. The majority of the region's poor live in rural areas and their well-being is inextricably linked with the surrounding natural environment. Climate change-related and other natural disasters render them even more vulnerable to poverty. At the same time, access to natural resources by the poor and marginal groups is increasingly constrained due to development pressures and population growth – by about 50 million people a year. Confronted with prospects of rapid economic growth, many countries fail to comprehend the real value of ecosystem services that are being degraded, or the full social and environmental implications of development trends, particularly the impacts on the poor. The environment remains a low priority for most contries in the region and is treated as an externality leading to low investment in environmental management – often less than 1% of GDP. Consequently the natural resource base on which the region's poor heavily depend on continues to be degraded.

Around 641 million people – two-thirds of the world's poor – still live on less than $1 a day in the Asia-Pacific region.

The Joint UNDP-UNEP Poverty Environment Initiative (PEI) programme for the Asia-Pacific region focuses on the links between environment and both poverty reduction and economic growth. PEI aims to improve the well-being of poor women and men by improving opportunities for livelihood development based on sustainable natural resource management and by making them less vulnerable to natural disasters, particularly in the context of climate change. As a policy-based initiative, PEI aims to achieve these objectives through integrating pro-poor environmental concerns into national, sectoral and sub-national development planning and economic decision-making processes.

PEI-supported activities are currently underway in 10 countries in the region: Bangladesh, Bhutan, Cambodia, Lao PDR, Nepal, Pakistan, Papua New Guinea, Thailand, Timor-Leste and Vietnam. Key highlights of the PEI country level support in Bhutan and Lao PDR are summarized below.

Bhutan: pursuing gross national happiness through sustainable natural resource management

Bhutan has adopted a constitutional obligation to preserve its environment, conserve its rich biodiversity and prevent ecological degradation. This forward-looking, far-sighted constitutional pledge is intended to ensure the long-term sustainable use of natural resources in a manner that not only benefits present and future Bhutanese generations but also contributes in a small measure to global environment health.

Within this constitutional framework the Gross National Happiness Commission (GNHC), Bhutan's apex planning agency, aims to mainstream pro-poor environmental management measures across key development related sectors. The Government's targeted poverty intervention programme, the Rural Economic Advancement Programme (Reap), offers a useful entry point for PEI to demonstrate the strong linkages between poverty and environment. Through Reap GNHC has been able to define a systematic approach to identifying sustainable livelihood opportunities for the poor, in most cases based on natural resources. PEI has also supported GNHC in preparing a set of guidelines for effective integration of pro-poor environmental management measures in various sectors. As a result of these guidelines, sectors are expected to adopt more environmentally-friendly development strategies.

Also in connection with Reap, PEI is supporting GNHC in preparing a planning manual for local authorities. This simple manual will guide local government administrators on adopting an integrated, bottom-up, consultative planning process giving due consideration to the linkages between poverty reduction and environmental management. The manual will be particularly useful in ensuring that decentralized budgets are used efficiently and effectively.

PEI supports an assessment of public expenditure, with a view to identifying direct and indirect environmental expenditure in all sectors. This exercise will serve as the basis for formulating a baseline and a reference framework for measuring future environment-related public investment trends in Bhutan and is also considered as a first step towards adopting a set of Green Accounts.

These initiatives have had a significant impact on the way the environment is perceived in the context of development planning in Bhutan. An approach maximizing both sustainable use and conservation of natural resources is particularly important for Bhutan as the country is finding it increasingly difficult to reconcile development and livelihood opportunities with the need to conserve the environment.

Lao People's Democratic Republic: managing private investment for rural poverty reduction and environmental conservation

Despite the significant decline in poverty at a national level, poverty persists throughout the country. More than 70% of the poor live in rural areas. Food insecurity still affects the rural population and the poor are very vulnerable to natural hazards and extreme climatic events.

The economy of the Lao People's Democratic Republic (Lao PDR) is primarily based on natural resources. Direct use of biodiversity resources in Lao PDR at household and commercial levels, has been estimated to be worth some $650 million a year. Natural resources account for three-quarters of the nation's per capita GDP, more than 90% of all jobs, almost 60% of exports and foreign exchange revenue, just under a third of government revenue and nearly half foreign direct investment (FDI) inflows.

FDI has become as a major source of government revenue, while driving faster economic growth. The availability of relatively "cheap" land and long-term concessions (30–50 years) is attracting foreign investors wanting to establish commercial production of rubber, cassava, sugar, pulpwood, maize, etc. FDI in commercial plantations is the main form of investment after mining. In many cases, corroborated by reports from several provinces, plantations are exacerbating existing (seasonal) food shortages, accelerating environmental degradation and causing adverse social impacts. Private investment in the mineral sector has registered almost 34% annual growth over the past five years (2002–6). Threats to the environment and rural livelihoods from activities associated with the mining sector are observed in the country, in particular increasing pressures on the availability and quality of land for agriculture, and hazardous chemicals. Another growing investment sector is hydropower which has raised serious concerns: flooding of forested areas; changes in natural water flows; biodiversity loss; resettlement of the rural poor; loss of access to and control over water resources; and conflicts over the use of water resources for power generation and for irrigation.

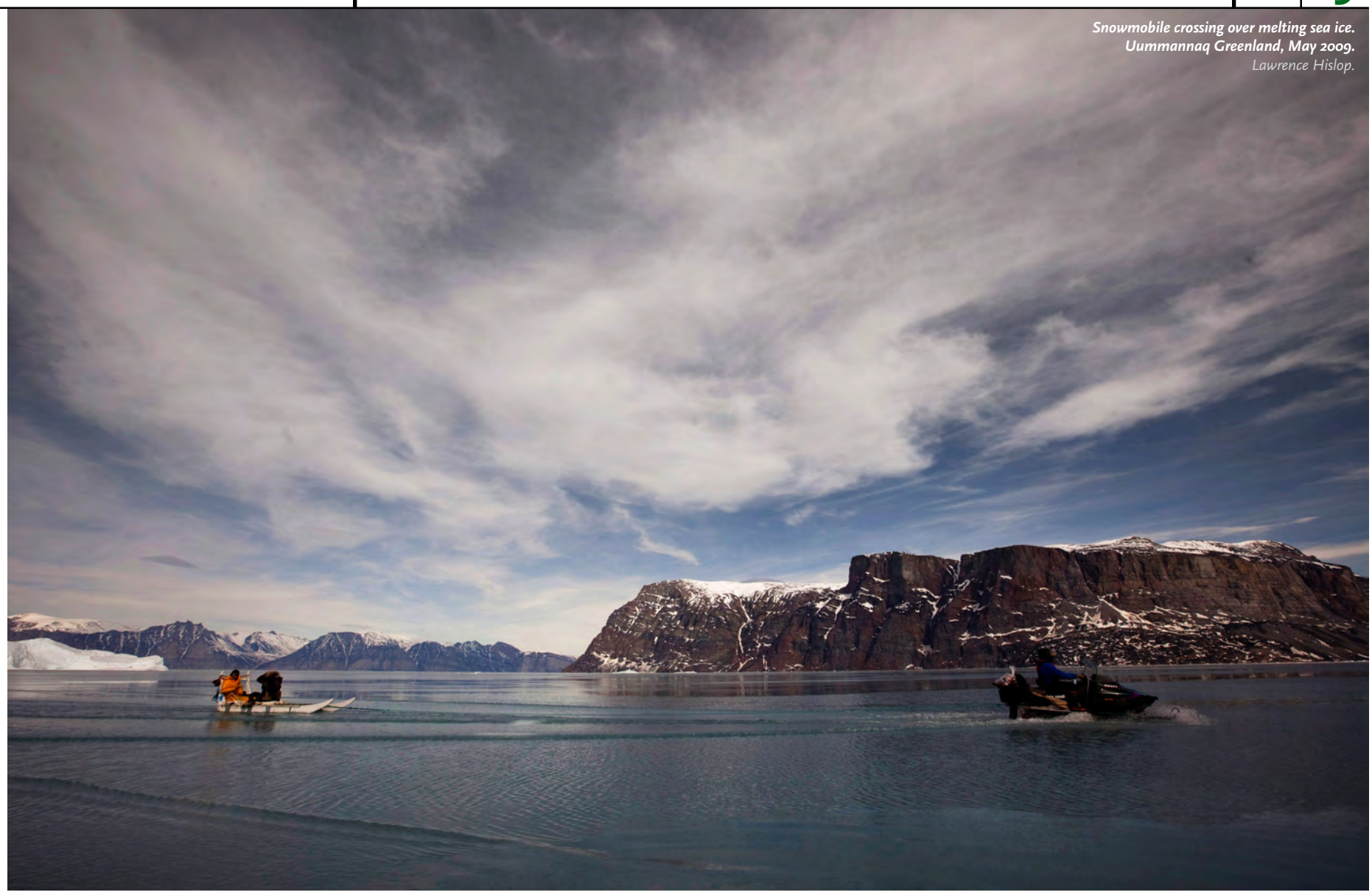
The Government has taken a number of important measures to secure the social and environmental sustainability of these investments, such as setting up the new Environment and Social Impact Assessment Department in the Water Resources Environment Administration. However, the pace and scope of investments in Lao PDR currently exceeds their capacities. This is a critical moment to provide support for more robust investment planning, management and enforcement capacities. The PEI framework, developed jointly with the Government of Lao PDR and the UNDP country office, has just begun its implementation for the period 2009-11. PEI will provide targeted support, among others to:

- support the use of integrated spatial planning resources for investment management;
- promote the application of existing studies on the environmental and social costs and benefits of investment choices to develop strategic investment management approaches;
- support development of national and provincial investment strategies;
- improve inter-ministerial coordination and strengthen existing institutional mechanisms and negotiation capacities to manage the social and environmental impacts of investment;
- enhance capacities for moniting and enforcing investment compliance; and
- strengthen the role of community consultation to inform investment decisions, management and monitoring.

Complementing sound investment management efforts, PEI will also assist with integrating environmental sustainability in the 7th National Socio Economic Development Plan 2011-15, enhancing the national capacity of Environmental and Social Impact Assessment and strengthening the National Assembly's legislative function related to environmental conservation, rural livelihoods and natural resource management.

Wood carving for monastery renovation, Bhutan. *Pandida Charotok, PEI.*

An Intha fisherman, Inle Lake, Northern Shan State, Myanmar. *Pandida Charotok, PEI.*



Snowmobile crossing over melting sea ice. Uummannaq Greenland, May 2009.
Lawrence Hislop.

Global warming – first to face the changes

*By **Justin Nobel** and **John Crump***

From the outside, the F Street offices of the Organization of American States resembles many other buildings in Washington, D.C. However, what was happening inside on that particular day was unique: a meeting was taking place involving a member of parliament from the island nation of Niue, a scientist from the Siberian state of Sakha and a deputy mayor from an Inuit community on the cusp of the North American continent. One person spent her childhood travelling by dogsled and two years ago was nominated for the Nobel Peace Prize while another, a professor from Barbados, actually won it. The Micronesians sent a delegate, as did the Cook Islanders, the indigenous Athabaskans from the Arctic, and the Seychellois.

They were all in Washington for one reason: because the Arctic and Small Island Developing States (SIDS) are barometers of global climate change. Through an alliance called Many Strong Voices (MSV) people in the SIDS are working together to make sure their voices are heard. The MSV programme is coordinated by UNEP/GRID-Arendal and recognizes that there are common interests between these two groups. Arctic peoples feel climate change faster and more drastically than people in most other parts of the world. People who live on small islands around the world are threatened by rising global sea levels and other climate change effects. Both groups are in communities relatively isolated from the rest of the world, and have limited resources to deal with change.

MSV has three main areas of work:

First, it tries to educate decision-makers so that those who make climate change policy, internationally and within the regions, understand the unique challenges faced by people in the Arctic and SIDS.

Second, through media interviews, public lectures, activities at the UN Framework Convention on Climate Change (UNFCCC) negotiating sessions and other venues, MSV brings the stories of how people are responding to the challenges of climate change to the rest of the world. A cornerstone of this effort is a project called Portraits of Resilience – a photography project where young people write essays and take photos of their world in a way that illustrates the human face of climate change.

Third, to support this work, MSV is conducting an assessment of the vulnerability and adaptive capacity in the regions. It is also working on a project to assess the impacts climate change will have on food security in the Arctic.

MSV helps to collaboratively devise solutions to the challenges of climate change and to raise the voices of peoples in these regions so they may be heard in international forums on climate change adaptation and mitigation. The programme involves policy-makers, indigenous peoples, NGOs, community organizations and researchers.

The partners in MSV maintain that:

☞ A global agreement is required that keeps global average temperature increases as far below two degrees Celsius as possible by ensuring large cuts in greenhouse gas emissions. Their argument is based on the IPCC IV report that clearly indicates that even if temperatures are kept below this level, vulnerable regions and countries, including the Arctic and Small Island Developing States, will be severely affected by the inevitable impacts of climate change.

☞ Climate change policy should learn from the experiences of indigenous peoples and islanders concerning adaptation and assist these communities in building upon their traditional knowledge in this area.

☞ The world's richest countries must help the vulnerable to adapt to climate change by providing adequate financial and technical assistance. For the Small Island Developing States and other particularly vulnerable developing countries, this means living up to existing adaptation funding commitments. Arctic peoples need a commitment from their own countries to fund local adaptation efforts in the Arctic regions.

MSV was spawned on the heels of a 2005 United Nations climate policy meeting in Montreal and met for the first time in Belize two years later. The places its constituents call home are as diverse as the planet has to offer, but as the planet warms they face the same looming catastrophe.

"We want to tell the world that the Inuit hunter falling through the ice and the Pacific Islander fishing on rising seas are connected," said Sheila Watt-Cloutier, former leader of the Inuit Circumpolar Council (ICC) and a nominee for the 2007 Nobel Peace Prize.

A few years ago, Watt-Cloutier gained worldwide recognition by indicting the United States in front of the Inter-American Commission on Human Rights for producing the greenhouse gas emissions that were warming her Arctic homeland at rates twice as fast as elsewhere on the planet. The warming hasn't stopped and neither has Watt-Cloutier.

"This is the start of the dying of a civilization," warned Dr Rolph Payet, an economic adviser to the president of the Seychelles, an archipelago in the Indian Ocean just north of Madagascar.

Some islands in his homeland are composed of granite with spires that rise into the clouds while others rest on a porous coral platform barely visible above the ever-lapping waves. Should sea level rise just several feet, as predicted by the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, of which Payet was a lead author, these islands will be inundated.

"Who will be prepared to chuck away a 1,000 year-old album with the history of all their ancestors overnight?" Payet asked.

Patricia Cochran, an Inupiat Eskimo born and raised in Alaska and former chair of the Inuit Circumpolar Council, presented a harrowing slideshow of her homeland.

In Shishmaref, homes hug cliffs that are crumbling – because of melting permafrost – into seas now more likely to be beset by storms as rising temperatures reduce sea ice. The media has publicized this town's problems, "but there are half a dozen other villages just like Shishmaref," noted Cochran.

Ice that hunters have relied on for centuries is melting earlier in the spring and shifting in ways locals don't understand. Cochran said that last year a convoy of more than 200 snowmobiles had to be rescued by helicopter after sea ice unexpectedly broke up.

Another effect of the changing ice conditions has been deaths of hunters whose machines have gone through the ice on what used to be reliable transportation routes. "There is not one of us without a friend who has taken their snow machine out and not come back home again," she said. Other problems include wildfires and unprecedented heat waves.

"We will not assume the role of powerless victims," said Cochran. "We will do everything we can to ensure our people who have been here for centuries will be here for centuries more."

The near-term goal of MSV is to build support for the greatest emissions reductions possible at the UN Climate Conference in Copenhagen this December. It is doing this by working with other partners in the negotiations now underway to insert wording in the text of the post-Kyoto climate change agreement. MSV partners are also working in other venues, such as the United Nations General Assembly, to get their message out.

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Building resilience by empowering individuals in communities is a key process in bottom-up growth. Capacity development comes in many shapes and sizes, but a critical factor is giving people a sense of personal belonging, ownership and collaboration.

Transition towns

*By **Tomas Marques** and **Anne Solgaard***

Poor communities are particularly vulnerable to climate change risks and to the impacts of rising energy costs. Climate change is already posing threats to communities in the poorest regions of the world. As oil prices will increase in the future due to the peaking of global oil production, poorer countries will suffer more because they have lower resilience to change and fewer resources to cope with rising energy costs. Arguably the ability of communities to respond to these threats will depend on how resourceful and cohesive they are in adapting to a changing climate, and reducing their carbon emissions and dependency on fossil fuels.

The combined threats of peak oil and climate change have spurred the emergence of the Transition Towns network that addresses fossil fuel dependency and aims to reduce communities' carbon emissions by moving towards decentralized low-energy systems, localization, and increased community resilience. The Environment and Poverty Times (EPT) interviewed Mr Ben Brangwyn, co-founder of the Transition Town Network based in Totnes in the UK. This article is based on the interview.

Peak Oil and Climate Change

The 2008 edition of the World Energy Outlook published by the International Energy Agency (IEA) stated that it is becoming increasingly apparent that the era of cheap oil is over1, and that the world is rapidly approaching a peak in global oil production. Peak oil refers to the point in time when the maximum rate of global oil extraction is reached, after which the rate of production will enter a plateau before entering a sustained and terminal decline.

As transportation, manufacturing, and food production directly and/or indirectly rely on oil, peak oil will pose serious energy, economic and food security problems for communities in both the developed and the developing world. Energy security problems will be further aggravated by the fact that alternative energy systems are not yet available or deployed on a scale required by the current economic model.

James Hansen, director of NASA's Goddard Institute for Space Studies, has warned that global warming will reach an irreversible global tipping point around 2016, if current levels of greenhouse gas emissions continue unabated. In the short term, runaway climate change will cause serious disruption to communities worldwide, followed by mid-term chaos and potential long-term societal collapse.

Developing countries, and especially the poor in these countries, will be the first and most affected by peak oil and climate change. For example, well before oil hit $147 a barrel in July 2008, several hospitals in developing countries were forced to switch off their generators. In some developing countries the spike in oil prices also resulted in food crises as money and land were poured into large-scale initiatives for the production of agrofuels. To prevent these impacts, decentralized and local solutions – such as local production and distribution networks for fuel and food – are starting to be acknowledged as important elements for cutting fossil fuel dependency and tackling poverty, while building communities resilience to rising fuel prices and climate change risks.

According to the Transition Network, if communities collectively plan and act early enough, they may create a way of living that is significantly more socially connected, more fulfilling, more equitable, and more in harmony with the environment. This vision of sustainability is to be achieved by applying the Transition Model, which follows 12 steps for moving communities towards re-localization3 and non-fossil fuel energy self-reliance.

The birth of the Transition Network

The Transition Model came out of Rob Hopkins' experience with implementing Kinsale's Energy Descent Action Plan. The plan sought to determine how the Irish town of Kinsale could shift from being a high to a low-energy consumption town in response to the challenge of the impending peak in world oil output.

Building on the same principles, the Transition Town Totnes in the United Kingdom was launched in autumn 2006. Soon after, Rob Hopkins and Ben Brangwyn started talking about the potential surge of demand for an organized support facility for transiting initiatives around the country and beyond, and the idea of the transition network was born.

Transition towns north and south

Asked if the Transition Town model can be applied to communities in developing countries, Ben Brangwyn replied that the approach has not yet been tested there. According to Brangwyn, "The focus of the approach is on cutting dependency from high-carbon lifestyles, which is more a problem of developed nations. Still, there is certainly a rationale for considering the key principles of Transition in developing nations, instead of replicating the unsustainable patterns of developed nations. It would be interesting to look at possible twinning initiatives to support north-south cooperation, joining communities in developed and developing nations that are facing the same type of problems, due to geographical, climatic, or other conditions."

Nonetheless, the Transition Network website is getting hits from internet users from all parts of the world, including developing nations and fast growing economies such as China, Pakistan, Kenya and Senegal. In 2009 the Transition Network counted 186 "official" transition initiatives, with well over 1,000 communities all over the world now in the early stages of setting up their own initiatives. These include communities from developing countries, from small towns to cities.

EPT asked Brangwyn about the difficulties of implementing the Transition Model at city-scale. In his opinion, some key differences of city-scale initiatives relate to the need to reach out to diverse social groups, and to greater challenges for local food production. "In a scenario with no or very little fossil fuels, people living in cities will have to devote time and effort to local food production, which must be localized due to the impossibility of transport over long distances for lack of fuel. Availability of space for urban food production, particularly in the inner city, can pose a significant problem. Nonetheless, and particularly on the issue of urban food security, very successful case studies such as the one in Havana6 point to the feasibility of such approaches at city level."

Training for change

With the swift spread of the Transition Model, several train-the-trainers workshops have been held in the UK, United States, Australia, New Zealand, China and Japan, to establish a pool of transition trainers to disseminate the approach further and support local initiatives.

In addition to background information on the need for transition, and training on the Transition Model, the train-the-trainers workshops address inner transition and psychology of change. According to transition trainer Sophy Banks, "Our outer world is created by our inner world. These are related and completely interlinked. Our beliefs shape our behaviour, priorities, and what institutions and organizations we support. These in turn shape the world around us." One key point promoted by the Transition Model is that fostering the transition to a low-carbon world will also require a personal transition to a less materialistic and less energy-intensive lifestyle. This in turn has the capacity to foster increased psychological well-being, or happiness.

This seems to be the case in all countries. The New Economics Foundation's Human Happiness Index (HPI) shows that high levels of resource consumption do not reliably produce high levels of well-being around the world. At a time of global economic and environmental crises, it is important that attempts at jump-starting the global economy take full account of the need to limit resource consumption, and seriously question the paradigm of endless economic growth.

Going for the real green new deal

Asked if the Transition Model could be a vehicle for a new green deal, Brangwyn emphasized that insisting on the paradigm of economic growth without acknowledging physical limits is not a good idea. "Approaches to a new green deal should aim at promoting conditions for moving towards a steady state economy. Globalized economies do not allow for people to fully see where the limits are. On the other hand, as we move forward with this re-localization project, we will be more able to see the limits to growth because we'll be using resources that are much closer to home. That way we'll be moving towards true sustainability, as opposed to sustainable development, under which endless economic growth continues to be promoted."

Brangwyn would like the Global Green New Deal and the forthcoming Green Economy Report to recognize ecological limits to growth, and to mention social resilience and sustainable ways of living. This would also include emphasizing the need to secure localized food sources. In addition, debt relief and waiving developing countries' debts to richer countries should definitely be included in the report as a recommendation.

Transition Town Network in brief

Its mission is to inspire, encourage, support, network and train communities as they consider, adopt and implement a Transition Initiative

The four recognitions:
1. Life with dramatically lower energy consumption is inevitable and it is better to plan for it than be taken by surprise.
2. Our communities presently lack the resilience to withstand the severe energy shocks that will accompany peak oil.
3. We must act collectively and must act now.
4. By unleashing the collective genius of those around us to proactively design our own energy descent, we can build ways of living that are more connected and enriching, and recognize the biological limits of our planet.

For more information: transitionnetwork.org

Cuba's shift to a low-carbon society

As the world rethinks a new and more sustainable model for agriculture and food security, it can draw crucial lessons from Cuba's past. In the wake of the break-up of the Soviet Union in 1991, Cuba made a radical departure from large-scale conventional monoculture systems to the wholesale de-industrialization of food and farming systems. Previously, the nation's agricultural production was largely dependent on imported and heavily subsidized inputs of petrochemical fertilizer, pesticides, fuel and advanced machinery. In the year preceding the Soviet Union's final break-up, Cuba suffered an 80% loss in trade and the sudden disappearance of nearly 1.3 million tonnes of fertilizer, causing agricultural production to drop by half. The collapse catalyzed an important paradigm shift away from heavily subsidized agricultural production systems towards integrated pest management and organic, low-capital, small-scale farming systems.

A study from 2008[1] confirms that Cuba, against all odds, managed to avoid its own food crisis by launching a semi-organic urban agricultural revolution. The study provided a valuable insight into the institutional structures and widespread changeover in management dynamics that were required. Today Cuba enjoys a thriving and virtually self-reliant system of agricultural production. As a side benefit the study confirmed that Cubans have also become leaders in soil conservation, organic farming methods, biopesticides, and worm composting. Even if it was from circumstantial necessity rather than choice, Cuba has effectively broken the policy barriers that seem to inhibit the adoption of a sustainable eco-agriculture system.

Source: UNEP Yearbook 2009, chapter Resource Efficiency, pp 47-48.
1. Wright, J (2008), Sustainable Agriculture and Food Security in an Era of Oil Scarcity: Lessons from Cuba, Earthscan Publications

In just three years, the Transition Network has evolved into an international grassroots movement with enormous visibility.

Mike Grenville.

During the dialogue with the EPT, Brangwyn was clearly critical of the current global economic model: "Selling developing countries models of consumerism disguised as development as a way towards a happier life is just not the way towards sustainability. What communities need is assistance for securing their food and energy systems, and their community life."

Developing countries

He noted that efforts towards re-localization in developed countries (such as the Transition approach), can have important indirect effects in developing countries. By reducing levels of demand through re-localization efforts, developed nations would diminish their pressure on energy and material resources that are currently being imported from developing nations, and would cease exporting wastes and pollution to these countries. "It is perhaps through this change of paradigm – re-localization in developed nations – that Transition approaches can best help developing nations." It will also be a key step towards addressing inequality in global energy and material use, and a move towards a system of fair shares.

Networks and knowledge sharing

In just three years, the Transition Network has evolved into an international grassroots movement with enormous visibility. The network is currently very active in the development of international knowledge sharing and networking platforms. The Transition Web project will link transitioners everywhere and allow users to have better access to information on transition initiatives worldwide. Another project – Transition Learning Connections – is already being piloted on the School of Everything web platform8, to connect people who offer training for transition and support for initiatives with those who want it.

A significant indicator of the rapid growth of the transition movement was the number of participants at the Transition Conference 2009. More than 350 transitioners representing several communities and countries gathered on 22–24 May 2009 in London to network and share experiences.

The main part of the conference included not only planned but also spontaneous workshop sessions where delegates initiated conversations on topics of interest. The thematic workshops allowed for discussion on diverse topics as "engaging with local authorities", "urban food production", "Transition Universities", and "cities in transition". Furthermore the UK Secretary of State for Energy and Climate Change, Ed Miliband, asked to attend the conference. The Transition Network agreed, on the condition that he came as a keynote listener – to which he agreed – making no speeches but instead attending several open-space meetings and engaging in small-scale discussions.

The main ambitions of the Transition Network for next year include further engaging with government in the UK at the local, municipal and national level, but as Brangwyn explained, "without handing over any power, so that Transition continues to be an initiative led by the communities for the communities".

■ **About the authors:** Tomas Marques works as Associate Programme Officer at the United Nations Environment Programme in Paris and Anne Solgaard is a Capacity Development Officer for UNEP/GRID-Arendal in Norway. The authors wrote this article in personal capacity. Both find great inspiration in the work of the Transition Network.

The Transition Handbook: From Oil Dependency to Local Resilience, A guide to preparing for a post-peak oil society, by Rob Hopkins (2008)

> *"If your town is not yet a Transition Town, here is guidance for making it one. We have little time, and much to accomplish."*
> Richard Heinberg, Post Carbon Institute, Santa Rosa, California, author of Power Down and Peak Everything.

We live in an oil-dependent world, and have got to this level of dependency in a very short space of time, using vast reserves of oil in the process – without planning for when the supply is not so plentiful. Most of us avoid thinking about what happens when oil runs out (or becomes prohibitively expensive), but The Transition Handbook shows how the inevitable and profound changes ahead can have a positive outcome. These changes can lead to the rebirth of local communities, which will grow more of their own food, generate their own power, and build their own houses using local materials. They can also encourage the development of local currencies, to keep money in the local area.

There are now over 180 Transition Initiatives in 18 countries, with more joining as the idea takes off. With little proactivity at government level, communities are taking matters into their own hands and acting locally. If your town is not a Transition Town, this upbeat guide offers you the tools for starting the process.

For more information on the transition town phenomenon, see www.transitionculture.org.
Publisher: Green Books. ISBN: 978-1900322188.

A typical day at the solar workshop. *Stewart Allen.*

The Barefoot College approach

By ***Stewart Allen***

Rebecca Banda, 45, of Kaphuka village in Uganda is a mother of five, and completely illiterate. Yet not only can she fabricate and assemble circuit boards for solar lanterns and charge-controllers, she can also test, maintain and install these systems in households throughout her village.

Rebecca is just one of 34 illiterate and semi-literate women from seven different countries in Africa who have recently completed their training at the Barefoot College. She has now returned to her village, and will in turn help solar electrify over 200 households and set up a rural electronic workshop for the maintenance of the systems and the further instruction of other villagers. The village has already agreed in writing how much she will be paid per month after she has installed fixed solar units with a solar lantern in each house. In this way, her skills will be passed on to a new generation of villagers, giving them much needed confidence and self-esteem and helping them to break out of the poverty trap.

Rebecca was one of the 'students' of the Barefoot College, which was established in 1971 in Tilonia, Rajasthan, India by noted social activist Sanjit 'Bunker' Roy. The college believes that community development lies in the hands of the people themselves and has pioneered an approach – known as the Barefoot approach – to solar electrification in 16 states of India and 19 other developing countries worldwide.

The college is the only college built by the poor for the poor, and is also the only fully solar-powered college in India – 45 kilowatts of solar panels provide power to run 30 computers, 500 tube lights, 125 fans, photocopying machines, an internet café, a pathology lab, a dental office, film editing equipment, cameras and slide projectors. The objective of the college is to identify and recognize traditional knowledge, village skills, and the practical wisdom of the poor and apply them for their own development. The college believes that illiteracy is not a barrier to acquiring skills and enabling the poor to develop themselves.

Solar power was first implemented on a large scale by the Barefoot College in 1986, to completely energize the 80,000 square foot campus at Tilonia. It was then but a natural step towards extending our philosophy of helping the poor help themselves, by including solar power within our remit. Since 1989, the college has trained more than 300 Barefoot solar engineers in India, who have in turn electrified over 12,000 houses covering 628 remote and inaccessible villages in 16 states of India, saving approximately 1.9 million tonnes of carbon emissions from polluting the environment through the use of diesel, kerosene, candles, torch batteries and wood. In 2005, with the help of several partners, the college started training women from developing countries abroad, predominantly countries in Africa, and also Afghanistan, Bhutan and Bolivia. So far, the college has trained over 150 foreign Barefoot solar engineers, 119 of them

Stewart Allen.

An installation practice session for one of the BSEs. *Stewart Allen.*

The First Rural Women Heroes of Timbuktu: www.youtube.com/watch?v=HHhpyS5U1KY.

Testing the lantern circuits. *Stewart Allen.*

women. In 2009, 34 women from seven countries in Africa are receiving training at the college.

The Barefoot College has demonstrated that any remote non-electrified village can be solar electrified and maintained by illiterate and semi-literate men and women. This is achieved moreover through community-managed and community-controlled initiatives that give power back to the people, in turn demystifying technology, reducing external dependency and increasing socio-economic sustainability. This unique approach to development turns the recipients of aid into active users, helping them to make major decisions and eventually providing them with the skills to take full responsibility.

Gul Zaman, the first woman solar engineer from Afghanistan, along with two other women, solar electrified the first five villages ever in the history of the country in 2005. Today in 2009, they have helped train 27 more women within the country and solar electrified over 100 villages in Afghanistan. By 2010 nearly 60 villages and 5,000 houses will have been solar electrified by nearly 100 rural women. They will be the first technically and financially self-sufficient solar electrified villages in the world reaching what Mahatma Gandhi called the last man.

For the Rebeccas and Gul Zamans of the world, the Barefoot approach has helped demonstrate what is possible when a little faith and patience is placed in those who are more used to being recipients of aid rather than active players. For this is the heart of the matter. When an individual or a community is given control and responsibility to identify and manage the issues affecting their lives, no amount of professional expertise can match their zeal and commitment.

This is but the tip of the iceberg however. Bringing electricity to rural areas is a key element of both human development and economic growth. Electrification not only frees rural women from the drudgery of fuel-wood collection – which in turn reduces the health risks associated with burning wood fires – but also provides improvements in health care delivery, education, agriculture and income generation.

The college is the only college built by the poor for the poor, and is also the only fully solar-powered college in India.

The solution to these issues is a simple yet highly effective one: decentralization. The Barefoot College, influenced by Gandhian thought, brought Gandhian principles to bear on 21st century technology. By decentralising, right the way down to the household level, providing not only the hardware but, most crucially, the 'software', that is, the skills needed to maintain and operate the systems, users now have direct control over their electricity generation. This is crucial in remote regions which are either not connected to a central grid or receive a very sporadic supply. In India alone, some 400 million people still have no access to electricity. The number rises to 500 million in sub-Saharan Africa. Stand-alone solar systems may just provide the answer to rural electricity needs in the 21st century, providing not only energy but also increased self-esteem and confidence.

In addition to solar training, the women are also given training in building rainwater harvesting structures. Rainwater harvesting (RWH) has been a mainstay of the Barefoot College since 1986 when severe drought forced us to find alternatives to the main water sources of the day. Today, this simple technology, the result of hundreds of years of traditional knowledge combined with some modern techniques, has transformed the lives of countless rural Rajasthanis and now rural women across the world. The principle is simple but effective. Water is collected on the traditional flat roofs found on many rural dwellings and channelled down through pipes and filtered into an underground water tank. This tank, depending on its usage, can then provide clean drinking water via a hand-pump for three to four months. Moreover, because these tanks often use the rooftops of school buildings, they provide much needed re-hydration to schoolchildren who often cannot attend school because of the lack of nearby water.

The training of illiterate women to become solar engineers and to subsequently solar electrify their villages represents a unique and unprecedented approach to development work. By giving the women the skills that they need to construct and maintain solar appliances, the women and the community where they live now have the capability to take charge of their own lives through a sustainable skills-based approach to development. The ramifications are far-reaching, demonstrating that with the right support structures in place, the poorest of the poor have what it takes to pull themselves out of poverty and provide a future for themselves, their children and their children's children.

■ **About the author:** Stewart Allen is a PhD student from the University of Edinburgh and is currently based at the Barefoot College.

Linking communities to share and adapt

New initiative to make learning lessons for a sustainable future easier

In March 2008 a group of development experts discussed a common problem: local knowledge available to those engaged in sustainable development initiatives is often poorly used, first because projects are often run in a top-down manner, and secondly because people in the field fail to learn from unsuccessful projects. As a result, the same mistakes are repeated and same lessons keep being re-learned in different projects and initiatives.

What was needed was an opportunity for local communities to get together in a network and exchange experiences and knowledge. The local knowledge of vulnerable communities being an essential part of any action for adaptation, this sharing process will empower communities across the globe to learn from one another to support sustainable livelihoods.

This was the starting point of the Global Adaptation Information Network (GAIN). GAIN uses information and communication technologies to provide an online meeting place where community knowledge, goals and needs can exist on an equal footing with expert knowledge found in formal research and education institutions. A capacity-building programme enables vulnerable communities to share their knowledge and experience, and to access the knowledge and experiences of others in the network. In practice, this will be done with the help of community facilitators, linked to regional hub organizations, which could be non-governmental or community-based bodies. So even if someone lacks access to computers and is not computer-literate, they can access the network through the facilitators.

The initiative, still at an early stage of the implementing phase, will be rolled out over a period of three years. As of June 2009, four communities in India, one in Kenya and one in Malawi have come on-board. Over the next two years the number is expected to increase to 15 communities from Africa, Asia, Europe and possibly Latin America.

GAIN will operate under the umbrella of UNEP's Global Climate Change Adaptation Network (GAN), which is to be launched at COP15 in December 2009. In particular, GAIN and its partners will support network activities, with a view to facilitating sharing of information and knowledge on climate impacts and adaptation practices between communities, as well as the exchange of best practices and lessons learnt. This work will be carried out in the context of the regional network components, specifically in Africa and Asia-Pacific. In the longer run, GAIN will support the establishment and operation of the global knowledge hub on adaptation, forming part of GAN and aiming to improve the availability, accessibility and usability of knowledge and technologies relevant to adaptation.

Mark Edwards/Still Pictures.

Dagmar van Weeghel/Nature for Kids.

Superheroes of the Future

*By **staff at Nature for Kids***

"Our message is that all children can be superheroes," says Ms Dagmar van Weeghel, founder and director of Dutch NGO Nature for Kids (NfK). "Through our innovative work, we want to empower children – to show them that their living conditions might not be good at the moment, but there is something they can do about it, and that through good management of their natural resources they can create a sustainable future for themselves and the environment."

NfK, founded in 2002, helps children growing up in the poorer regions of the world learn these lessons through the use of interactive film and theatre. To this end, the NGO has produced an educational environmental school TV series entitled Superhero, aimed at children throughout Africa. So far, five 24-minute edutainment programmes have been produced. Each one tells an engaging story of a local child who learns about an environmental problem in his or her community and then takes the lead in finding a solution that benefits both the natural world and the village community.

Sophia and the Terrific Forest, for example, talks about deforestation and encroachment of wildlife and natural areas, while Mkobo and the Great Lion discusses food chains and human-wildlife conflicts. Issa and the Returning Grasslands deals with erosion, overgrazing and land management, and Faraja and the Wonderful Water talks about water resource management. Kagiso and the Clean Village is about waste management, including the three Rs: Reduce, Reuse, Recycle.

Through the issues discussed in these films, the fictional superheroes show real-life school children that the cycle of poverty and environmental degradation can be broken through sustainable management of their natural resources. By watching the simple yet important actions that Sophia, Mkobo and the other young characters take – such as tree planting, organizing clean-up campaigns, catching rainwater and encouraging herders to keep cattle away from drinking water – the schoolchildren acquire the basic knowledge, skills and values that promote environmental responsibility.

Because of the unique education-through-entertainment formula, these innovative school TV programmes are not just documentaries – they are exciting and captivating short screenplays featuring local schoolchildren (7-12 years) and their communities. "These programmes are not a condescending form of education, because they're all about children talking to children," says Ms van Weeghel. "They're fun and interactive – and I think interaction is the key to anything you're trying to get across. It's a very powerful tool with which to influence people; it's part of how we connect and how we become aware of our wider environment. So, why not stimulate children's minds and hearts in underdeveloped countries in a way that has been proved to work?"

Local partners supply NfK with research input on the conservation messages. Local languages, such as Kiswahili, are used in the films and supporting materials, which also help the children to understand and relate to the characters and environmental messages. However, NfK also works with voiceover in its films, so each programme can easily be dubbed into any language. One film can therefore be used to reach children in many different countries.

The films are brought to schools in rural areas with the help of a mobile cinema and a team of local teachers. The film packages (film and additional materials such as booklets, questionnaires, baseline surveys, posters, water tests, etc.) are also used by local education centres, refugee camps, NGOs, and wildlife and environmental clubs. This is often the first time many of the children have ever seen a film, so the impact of these programmes is tremendous. After viewing the films, the teachers start lively group discussions, including environmental songs, to involve the children.

The teachers are also provided with surveys, booklets, posters, water-testing kits and other materials. These enable the teachers to do interactive follow-up activities with the children, such as organizing clean-up campaigns, planting trees and making recycled art. NfK is also working on a new project which will provide seedlings to 76 schools in Tanzania, enabling the pupils to plant a school nursery.

Through all these activities, the pupils learn about the benefits and essential ecological roles of different ecosystems and the interactions and relationships between various ecosystems, as well as the threats to their existence. Most importantly, the pupils learn how their actions can have a positive impact on the world around them in protecting vital natural resources that they are heavily dependent upon.

Over the past four years, the NfK programme has proven to be effective and very appealing to the target audience – thousands of children in Tanzania, Kenya, Uganda and Sierra Leone, as well as their teachers. After watching the films, some of the children want to be the star – the new superhero – of the next film, while others want to go home and discuss what they have learned with their parents.

After watching Issa and the Returning Grasslands, for example, one pupil from Itunundu Primary School in Tanzania said: "At home we have a big number of unhealthy animals and today I'm going to tell my father to sell some animals and buy seeds so we can have healthy cows and plant grass like Issa." Meanwhile, a pupil from Mikocheni Primary School in the Karatu district of Tanzania, said: "I liked the movies because they taught us about the relationship between plants, wild animals and human beings. We learned that plants are important to human beings because we get our food from them and forests are important because they make rains, which keep everything alive."

The teachers have been very positive about the films, both because they provide a new and interactive addition to their curriculum and because the teachers really appreciate receiving new knowledge about the changed local environment – and new methods through which their pupils can learn to care for it. For example, one teacher from Makifu Primary School in Tanzania said: "The students are very happy this year because they can watch kids like themselves act in the movies, and this inspires them to become superheroes in their own communities."

In northern Tanzania, NfK works directly with about 150 schools, while in other areas it partners with local organizations, including Friends of Ruaha Society, the Jane Goodall Institute, Filmaid International, Malihaj Clubs of Tanzania, Youthlink and Unite. The films are also available to national parks, environmental education centres, wildlife clubs and scouting groups and will have reached approximately 350,000 pupils by the end of 2009. In this way, both individuals and organizations can be mobilized to assume roles that can produce a multiplying effect in each aspect of environmental management and sustainable development.

"I hope that if our organization and others keep embedding and instilling a better understanding and appreciation for the environment in the children, then caring for the environment will become something natural," says Ms van Weeghel. "Then the children will realize that the environment is not an endless pit from which we can only take, but we also have to give back to it in order for it to sustain our lives."

For more information, visit www.natureforkids.nl

Nature for Kids – The Facts

Nature for Kids (NfK), established in 2002, uses film/school TV programmes to create environmental awareness among children growing up in the poorer regions of the world. The NFK edutainment programmes transmit the basic knowledge and values that will enable both young people and the place where they live to prosper.

- A programme of tailor-made films with accompanying interactive teaching material, tackling important environmental issues such as over-grazing, water management, resource efficiency, deforestation, endangered species and more.
- The films are produced by – and star – a local cast and crew.
- To date five films have been produced in Africa.
- Since 2006 the mobile School TV team from NfK has visited over 140 schools in Northern Tanzania, enabling more than 70,000 children to view and benefit from the NfK program. NfK materials are also being used by local partners in Tanzania, Kenya, Sierra Leone and Uganda.
- To date more than 400,000 children have seen NfK's innovative materials.
- All films and educational packs are produced in the native/local language, whether Swahili, English or Rutooro.
- This interactive and innovative approach to environmental learning is universal in appeal. NfK's mission is to roll out these materials and programmes to other locations and countries in the future.

www.natureforkids.nl

Power to change

How using information and statistics can contribute to sustainable development

*By **Rune Riktor** and **Dag Roll-Hansen***

Change often comes from the outside, sometimes as a slight wind that pushes us in directions we do not necessarily want to move. Or change might come as a furious hurricane, causing pain and disaster. The most beautiful change, though, is often that which comes from within. The will and ability to execute change can make the difference for individuals, families and societies.

When history is a blur, the future is uncertain and each day has enough trouble of its own, there are specific steps we can take, especially if the challenge is to find the path to a better future for a community or a country. Leadership means getting an overview of the situation, learning from the past if possible, and finding the road map to achieve continuous and sustainable improvements.

The most beautiful change is often that which comes from within. The will and ability to execute change can make the difference for individuals, families and societies.

The Norwegian writer Thomas Hylland Eriksen wrote in his 2002 book Tyranny of the Moment that in the fight between "fast" and "slow" time, fast time always wins. What appears to be important here and now takes the focus away from what is essential in the long run. Then our actions tend to be short-termed, and do not seem to lead to a sustainable path. Sustainability, then, is about building a long-term perspective into our short-term decisions in a way that leaves as many – if not more - resources and possibilities to our children as we had ourselves.

Statistics Norway is using a human-oriented, fact-based approach when assisting developing countries in building their future on knowledge and insight. As Sir Francis Bacon said: "knowledge is power," and it seems like Statistics Norway's developing partners agree.

Statistics in developing countries

Statistics are key to a knowledge-based and sustainable fight against poverty. They are the essential starting point offering information about distribution of wealth and changes in living conditions in developing countries. Used wisely, quality statistics may contribute to sustainable development in many areas.

Building statistics to manage resources

In Southern Sudan the government is facing a number of challenges. It needs data on the welfare of the population and the state of the economy. The Southern Sudan Commission for Census, Surveys and Evaluation is gradually supplying more of this data. It has published a consumer price index quarterly since April 2007, and it recently completed a successful population and housing census. The next step is a household survey to collect information on living conditions in both northern and southern Sudan.

Statistics are a basis for governments to monitor and manage the economy. It is an imperative for efficient resource allocation and decision-making in both the private and public sectors. Statistics also indicate differences and changes in living conditions, revealing what leads to poverty and what should be done to eradicate its causes. Statistics are important for the formulation of evidence-based and transparent policy-making. It is a factual basis for open public debate, in media and in national decision-making bodies.

In short, statistics tell us how successful policies are: whether investments in health-care reduces maternal mortality; whether more children attend school when the number of trained teachers increases; and whether implementing agricultural projects means that fewer people starve. Statistics show whether our goals are achievable and whether our strategies are on the right track.

In Malawi the National Statistical Office is producing high-quality statistics in many areas: on the volume of agricultural output; key figures for monitoring the economy; and important social indicators. It is also calculating the share of the population below the poverty line on an annual basis. This work is done in cooperation with Statistics Norway. The core of the cooperation is transferring skills and technology for statistical production.

To create sustainable institutional competence, the national statistical institutes both in Malawi and Southern Sudan are establishing in-house training centres to facilitate the transfer of knowledge between colleagues.

"Training must do two things. First it must move your attitude. Second the skills you gain can only be seen in your work. If work has not changed, then training has done nothing. And remember, the knowledge you gain is not yours. You have to pass it on to others."

Isaiah Chol Aruai
Chairman of Southern Sudan Commission for Census, Statistics and Evaluation

Statistical agencies are not producing maize or building houses. Our raw material is human beings. That is what we have to develop to manage resources efficiently.

Analysis for sustainability

Sustainability is of industry wide relevance. The SAS Institute, as a leading vendor of statistical analyses and forecasts, addresses sustainability with analytics and management support. Analytics is crucial for predicting, understanding and managing the future, it being essential to stay ahead of the curve and make changes proactively.

A country, or even a region or local community may ask questions about future challenges, for both the short and long-term: Will we be able to feed ourselves? Will our area be populated in 50 years? Will we be able to supply our people with public services? What might be the effects of climate change in our district? Are there risks that we can predict early enough to prevent them? All such questions can be addressed by using analytics, as in Malawi, to see trends, describe patterns, develop scenarios as a basis for taking action.

Hawa Khamis Aganas from Southern Sudan Centre for Census, Statistics and Evaluation, one of the participants in a Human Resource Development workshop.

Southern Sudan and Malawi

Southern Sudan has had Africa's longest running civil war. It ended in January 2005. The conflict was between the north and south of Sudan. The peace agreement with the Republic of Sudan gives the south the chance to vote for full independence in 2011 after six years of home rule.

Malawi is one of the least developed and most densely populated countries in Africa. The economy is heavily based in agriculture, with a largely rural population. The Malawian government faces challenges in improving education and health care, protecting the environment and becoming financially independent.

In Norway the SAS Institute is cooperating with the Norwegian Association of Local and Regional Authorities (KS) and its subsidiary to provide tools for local government to manage the future sustainably. Hopefully this will raise awareness about future development and enhance our ability to make the necessary changes.

Private companies face comparable challenges: Is our way of doing business sustainable in the long run? What will happen to our profits if taxes or resource prices increase? Are we building our business on structures or resources that may disappear? How can we find a robust and sustainable approach to running our company, in a way that contributes to healthy growth and increased company value?

A major challenge arises when a privately owned company takes account not only of shareholder value but also social responsibility, including the company's external effects. Such responsibilities might range from employee working conditions to the effect the company's business has on the surrounding environment, including noise, pollution, transportation and resource usage. In the short term, profits can be maximized by ignoring these issues. But in a longer perspective no company should run their business irresponsibly. It is simply not sustainable. It is not good for society, not good for employees and lastly – it is not good for the company.

There are external drivers that support a shift towards more responsible business practices. International agreements, new taxes and regulations, new expectations from customers, and public opinion on how business should be run are all affecting companies. It is bad for the company's brand image to be irresponsible. And companies can miss out on profits if they do not become more flexible to meet regulation and see new opportunities created by the new era.

The challenge is to find "the right thing to do" and "to do the right thing" that also aligns with the company's business idea and strengthens it.

For a government the challenge is to find the right policy to support a sustainable growth.

The challenge is to find "the right thing to do" and "to do the right thing" that also aligns with the company's business idea and strengthens it.

What next?

Above all sustainable development is about being conscious and having consciousness. Being conscious means using available information to create knowledge and insight. Basing management on facts is more transparent and democratic than relying on gut feelings or irrational impulses. If the information is not available, well, go out and find it!

Consciousness arises when ethics meets knowledge and demands action. Thereby the moral is established, and the good corporate citizens stand out of the crowd and lead the way into the future. Consciousness is driving change not only for the meaning of change itself, but for better values and a better basis for coping with the future. This is power used in a good way – the power to change.

■ **About the authors:** Rune Riktor is Business Developer at SAS Institute, Norway and Dag Roll-Hansen is Senior Adviser at Statistics Norway.

How does resource efficiency relate to the Millennium Development Goals?

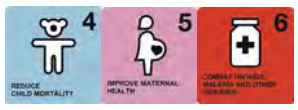
POVERTY

MDG1: Eradicate extreme poverty and hunger

Greater efficiency in resource use and reduced environmental impact from the production of goods and services over their life cycle results in improved productivity and reduced costs. In short, it allows more to be done with less.

Growth in consumer demand for sustainable products can provide sustainable producers in developing countries with access to new markets as well as price premiums for their products.

Provision of cleaner and more resource-efficient services (such as water, energy and food) allows more people to meet their basic needs.



HEALTH[1]

MDG4: Reduce child mortality
MDG5: Improve maternal health
MDG6: Combat HIV/AIDS, malaria and other diseases

Water and sanitation-related diseases and acute respiratory infections (primarily from indoor air pollution) are two of the leading causes of under-five child mortality. Providing cleaner and more resource-efficient energy and water services will help to reduce the prevalence of these diseases.

Damage to women's health from indoor air pollution or from carrying heavy loads of water and fuel wood can make women less fit for childbirth and at greater risk of complications during pregnancy. Providing cleaner and more resource-efficient energy and water services will help to reduce these risks.

Malaria, killer of an estimated 1 million children under age five every year, may be exacerbated as a result of deforestation, loss of biodiversity and poor water management. Improved resource efficiency would help to reduce these pressures.

GENDER & EDUCATION[1]

MDG2: Achieve universal primary education
MDG3: Promote gender equality and empower women

Collecting water and fuel wood places a burden on women and children (especially girls), reducing the time they have available for education or income-generating activities. Providing clean and resource-efficient energy and water services will help to reduce this burden. Providing clean and sustainable energy will also allow children to do homework after daylight hours.

Including resource efficiency issues (such as the three Rs of reduce, re-use and recycle) in the school curriculum can influence the behaviour of young people and their parents.

ENVIRONMENT

MDG7: Ensure environmental sustainability

Improved resource efficiency helps to achieve the objective of decoupling economic growth from environmental degradation, thereby slowing biodiversity loss.

Promoting the efficient use of limited water resources through techniques such as drip irrigation and rainwater harvesting helps to reduce stress on water resources and improve access to water supplies.

Integrated waste management, including through the three Rs approach of reduce, re-use and recycle, can help to improve the lives of people living in slums, as can the adoption of sustainable urban transport solutions such as integrated rapid transport systems.

DEVELOPMENT / PARTNERSHIP

MDG8: Global partnership for development

Technology transfer through development assistance can allow developing countries to "leapfrog" to a sustainable development path, bypassing inefficient, polluting and ultimately costly phases of development.

International coordination and cooperation efforts to promote resource efficiency such as those based on the Marrakech Process on Sustainable Consumption and Production help to promote international partnerships, efforts and initiatives to stimulate resource efficiency.

The Green Economy Initiative endeavours to mobilize and refocus the global economy on investments in clean industries and technologies and natural infrastructure such as forests and soils, this being seen as the best bet for real growth, reducing ecological scarcity, combating climate change and triggering an employment boom in the 21st century. In doing so, it aims to contribute to the crafting of a global set of actions that are more conducive to sustainable wealth creation and achievement of the Millennium Development Goals.

1. Adapted from UNDP-UNEP (2009) Mainstreaming poverty-environment linkages into development planning. A handbook for practitioners

Dear reader,

We are in a year of economic as well as ecological crisis, and the topic for the 6th issue of Environmental and Poverty Times is resource efficiency as a catalyst for a greening of the world economy and its subsequent contribution to poverty alleviation efforts.

Greening the world economy means transforming markets and finance systems into partners promoting and implementing sustainable development. We may be witnesses to the establishment of new economic models resulting from a long called for paradigm shift that considers the importance of natural and social capital. Time will tell. One thing is certain; we are all part of the puzzle and its possible solution.

This issue of Environment and Poverty Times will point to a few examples of shifts in thinking about economics that may lead to a more sustainable future. Practical examples of resource efficiency that contribute to a greening of the economy are emphasized. You will get snapshots of inspiring cases from around the world highlighting themes such as sustainable energy, waste management, construction and sustainable tourism. These examples show that significant gains can be made by introducing green economy principles and building resilience whilst supporting the development of green(er) jobs and the reduction of poverty.

Environment and Poverty Times aims to be of interest not only to professionals working in the area of sustainable development, but also seeks to grab the attention of the general public. Most of the articles focus on concrete and practical experiences 'from the field'. By providing stories, interviews, maps, charts, and pictorials we are attempting to demonstrate some of the potential wealth of perspectives and initiatives that flourish world wide. These efforts serve to show some of the many different approaches that can lead to the improved livelihood of the poor whilst also often addressing the value of the natural capital that society all too often takes for granted.

If you want to read this or previous issues of the Environment and Poverty Times on the net, please stop by at www.environmenttimes.net – and tell your friends.

Enjoy reading!

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