# OurPlanet

*United Nations Environment Programme*

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# Small Island Developing States

UNEP

**Emanuel Mori**
Restoring a Safe Climate

**Freundel Stuart**
From Potential to Realization

**John Ashe**
Seizing the Moment

**Wu Hongbo**
Island Voices, Global Choices

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United Nations Environment Programme

Photo: *David Kirkland*

# OurPlanet

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# Table of Contents

## Features

















# Achim Steiner
# Reflections

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**Achim Steiner**

*United Nations Under-Secretary-General and UNEP Executive Director*

This year, 2014, was chosen as the International Year of Small Island Developing States in recognition of the need to see the escalating environmental crises facing these countries as a global challenge.

How small island developing states (SIDS) respond to threats such as sea level rise, freshwater scarcity and biodiversity loss, and the degree of support they receive, is indicative of how we, collectively, will adapt to a host of climate change impacts in the coming decades.

The world's 52 SIDS boast a variety of endemic species, biodiversity and indigenous knowledge that make them mainstays of our planetary ecosystem.

SIDS produce less than one per cent of global greenhouse gases, yet they are highly vulnerable to the impacts of climate change, including coastal erosion, coral bleaching, ecosystem destruction, and adverse effects on crops and fisheries. SIDS are also disproportionately affected by natural disasters. The cumulative cost of disasters to SIDS' economies over the past two decades has been as high as 90 per cent of GDP, reversing years of development gains.

Climate-change-induced sea level rise in SIDS continues to be the most pressing threat to their environmental and socioeconomic development. Under the latest IPCC scenarios for a global average temperature increase of approximately 4° Celsius, sea level rise could be as much as one metre by 2100, a scenario that would affect almost 30 per cent of the population of SIDS living in areas less than five metres above sea level.

It is hoped that the new international climate change agreement currently being negotiated, and which will be adopted at the Paris conference in 2015, might help to relieve SIDS of

*The environmental threats facing SIDS are the same ones that are facing us all. But larger economies, due to their scale, can better mask the impacts of exhausting their natural capital than smaller ones.*

some of the economic burden of adapting to the impacts of climate change, while also reducing the severity of the impacts on SIDS by reducing global greenhouse gas emissions. But we should not look at climate change threats in isolation from other anthropogenic ones, because climate change is exacerbating existing problems such as desertification, biodiversity loss, and food insecurity.

Take the degradation of marine ecosystems as an example. A number of studies show that it is overfishing that outweighs all other human impacts on marine ecosystems, including climate change.

With SIDS accounting for 7 out of 10 of the world's countries most dependent on fish and seafood consumption, reducing emissions alone will not be enough to ensure that SIDS will have a sufficient supply of fish in the future. The environmental threats facing SIDS are the same ones that are facing us all. But larger economies, due to their scale, can better mask the impacts of exhausting their natural capital than smaller ones. However, if economic growth continues at the expense of our natural environment, we will all feel the impacts of climate change and environmental degradation as acutely as the people of SIDS are feeling them now.

Solutions to these threats that preserve the business-as-usual economic models that have brought SIDS to the state of economic and environmental fragility they are in today will be temporary at best, and catastrophic at worst.

That is why SIDS are beginning to take the first steps on a blue-green economy transition that will build their resilience to the impacts of climate change, and move their economies forward—sustainably and inclusively. The energy sector, where SIDS are leading the switch to renewables, is a prime example of necessity driving innovation and change. The cost of oil imports and debt servicing of up to 70 per cent of GDP has left SIDS highly vulnerable to fuel price fluctuations. On average, Pacific island households spend approximately 20 per cent of their household income on energy.

Many SIDS are now pursuing domestic renewable energy sources, such as solar and wind, for a more sustainable power production system. Through the Sustainable Energy For All initiative, SIDS are undertaking expansion of their renewable energy sector and, by 2030, they should increase the deployment, penetration, and efficiencies of renewable sources using existing cost-effective technologies.

The governments and people of SIDS will reiterate their commitment to sustainable economic growth at the Third International Conference on SIDS, taking place in September in Samoa. What they are calling for are resources and support to act on that commitment on a scale that will radically change their fortunes.

In support of this call to action, UNEP is producing the *Guidance Manual on Valuation and Accounting of Ecosystem Services for SIDS* and the Global Environmental Outlook Report for SIDS, both of which make clear that the responsible management of natural assets directly benefits the economy and is the cornerstone of sustainable socioeconomic development.

Building the momentum for the transition of SIDS to a blue-green economy requires a substantial redirection of investment to increase the current level of public and private sector flows to key priority areas. SIDS have a crucial role to play in this transformation. From valuing and managing their natural resources, such as fisheries, to putting the right incentives in place to allow the switch to renewable energy, each island state can advance its national sustainable development goals.

For the rest of the world, supporting SIDS on this journey of transition provides an unprecedented opportunity to be part of game-changing socioeconomic solutions that can be applied in broader contexts and bigger economies. In short, we should look upon SIDS as microcosms of our larger society, and not stand back and allow them to grapple with a threat that is, by and large, not of their own making. ▲

# Emanuel Mori

# Restoring a Safe Climate

## *Why HFCs should be phased down*

**Emanuel Mori**

*President, the Federated States of Micronesia*

More than twenty years ago, my country's then-President, His Excellency Bailey Olter, addressed the first United Nations Conference on Environment and Development—the so-called, Earth Summit—held in Rio de Janeiro. Speaking on behalf of the Pacific Islands Forum, as its current chairman, he stressed that climate change and its associated sea level rise was already threatening the homelands of more than ten million people in island nations worldwide. By extension, and in differing ways, he pointed out, the threat to island peoples is an early warning to all the peoples of our planet.

The 1992 Earth Summit was a hopeful and optimistic occasion where no less than 104 of the world's Heads of State convened in an unprecedented session, fundamentally to agree that environmental protection and economic development for both the developed and developing worlds are not mutually exclusive. The product of the conference, Agenda 21, remains on the table today.

Also at that historic conference, following several years of hard negotiations, the United Nations Framework Convention on Climate Change (UNFCCC) was opened for signature. Several years later, at Kyoto, Japan, a protocol to the UNFCCC was adopted as a first step in setting global targets and timetables for reductions of greenhouse gas emissions, primarily those of carbon dioxide.

Without commenting on the many political considerations, it is fair to say that two circumstances have emerged in parallel since 1992 to present us with the dilemma that we face today. On the one hand—thanks to the diligence of our scientific colleagues worldwide and the evidence seen by our own eyes—we now know that climate change is no longer a debatable threat. It is happening, and its longer-term outcomes are increasingly predictable. On the other hand, bold speeches aside, the world has not yet found the political courage to take effective global action to reverse or even delay the mounting consequences of climate change. We all dare to hope that negotiators will overcome such obstacles in the UNFCCC process at the Conference of the Parties in Paris at the end of 2015, and produce an effective treaty that will be implemented in 2020.

But once emitted, emissions of carbon dioxide, the main focus of the UNFCCC, stay in the atmosphere for many hundreds to thousands of years. The climate of our planet does not turn on a dime. We in the islands—already experiencing land erosion, compromised food security, more intense storms and damage to our vital ocean resources—thus have to face the awful question: "Is it already too late to save the islands that have been our homelands for thousands of years?"

Maybe not. With all the anguish and frustration over the seemingly endless debate in the UNFCCC, my country, the Federated States of Micronesia, decided in 2007 and since

Photo: *Shutterstock*

Photo: *Shutterstock*

*The world has not yet found the political courage to take effective global action to reverse or even delay the mounting consequences of climate change.*

**HFCs are the fastest-growing greenhouse gases** *in the US, Europe and China.*

to advance a proposal in another venue, the very successful Montreal Protocol to the Vienna Convention on the Protection of the Ozone Layer. The Protocol's parties have literally reversed the growth of the so-called ozone hole in the Earth's atmosphere by acting multilaterally to phase down the use of the ozone-depleting chemicals used in refrigerators and air conditioners, among other things. That is good for the ozone hole, and it has been good for the climate as well, as the same chemicals also warmed the atmosphere.

But some of the substitute ozone-friendly chemicals, a class known as hydrofluorocarbons (HFCs), happen themselves to be super-greenhouse gases many times more potent than carbon dioxide. Today they are the fastest-growing greenhouse gases in many countries, including in the United States, Europe, and China. The good news is that HFCs are currently only a small problem: if we address them now we can avoid a major problem in the future. The other good news is that most of the HFCs now being used persist in the Earth's atmosphere for only a decade and a half, as opposed to centuries for carbon dioxide—and the same is true for other short-lived greenhouse pollutants such as methane and black carbon. So, if the production of such pollutants can be phased down, we can realize a very significant climate benefit in the short-run.

If we cannot hope completely to halt the march of climate change today, at least we can hope to slow it down with this approach, giving our islands and the rest of the world the opportunity to come to grips with the fundamental long-term challenge of carbon dioxide emissions.

With this in mind, the Federated States of Micronesia has sponsored over several years, as a first step, an amendment to the Montreal Protocol to phase down the production of HFCs. Our proposal is now pending before the Parties to that treaty and we earnestly seek the support of all nations for this effort. Thankfully, we are not alone in seeing this opportunity and are grateful for the growing support among developed and developing nations alike for immediate action against all short-lived greenhouse pollutants. This support includes the G20 largest economies of the world.

We who inhabit our planet at this time confront the greatest challenge of stewardship ever faced by mankind. For the sake of all who come after us, we must take the steps we can today, starting with phasing down HFCs under the Montreal Protocol, as we pursue the long march to restore a safe climate for the future . ▲

# Freundel Stuart

# From Potential to Realization

## *Using renewable energy in SIDS—the case of Barbados*

**Freundel Stuart**

*Prime Minister, Barbados*

The year 2014 represents a historic year—the International Year of Small Island Developing States, which is focusing attention on a part of the world that has made an indelible contribution to humanity's sojourn on this planet.

This year also marks the first year of the United Nations Decade of Sustainable Energy for All, and presents a unique opportunity to bring the issues of small island developing states (SIDS) and Sustainable Energy for All (SE4All) even closer together, and to highlight those issues which affect small and large nations alike—energy cost, energy security, and climate change.

Since 2000, the world has focused resources on development targets, which include halving the world's poverty and ensuring environmental sustainability by, among other things, increasing access to energy. Notwithstanding these efforts, and some commendable achievements, in 2013 the United Nations still reported that environmental sustainability is under severe threat and that global emissions of carbon dioxide are accelerating. In addition, the 2012 Rio+20 Conference on Sustainable Development (Rio+20) reaffirmed that SIDS remain a special case for sustainable development in view of their unique and particular vulnerabilities. It is not surprising, therefore, that the global economic crisis of 2008/2009 threatened their development.

In fact, Rio+20 noted with concern that the five-year review in 2010 of the Mauritius Strategy concluded that SIDS had not made considerable progress and may even have regressed when compared to other groupings.

Twenty years after the Global Conference on Sustainable Development of Small Island Developing States was held in Barbados, in 1994, these challenges are now even more acute and demand a new level of global cooperation if the Earth is to be seen within the construct of a living organism. Of particular concern to SIDS is the deficiency in petroleum-based energy. We recognize our huge potential in alternative energy resources—from geothermal energy to hydro and biomass, as well as the abundant sunshine—but the main barrier standing in our way is the finance to utilize these resources.

It was the recognition of the growing importance of sustainable energy to the economy that Barbados, being the only representative of a small island developing state on the United Nations Secretary-General's High-Level Panel on Global Sustainability, fully endorsed the United Nations SE4All initiative. If we are to place the subject of energy firmly within the consciousness of SIDS there must be a concerted effort on the part of all players—governments, the private sector and civil society, since we all share a common bond as human beings—to have a source of energy constantly within our reach, when needed, at an affordable cost.

SE4All proposes doubling the rate of improvement in energy efficiency to achieve a 40 per cent reduction in electricity consumption by 2030, and doubling the share of renewable energy in the global energy mix by increasing it to 30 per cent.

Barbados is seeking to transform this potential into a reality and is poised to transition to a green economy based in part on ongoing investments in renewable energy and energy conservation. We have recognized that the country simply cannot continue with the importation of fossil fuels at almost seven per cent of gross domestic product, as this is simply unsustainable. This transition will be based on a suite of policy investments and governance

Photo: *UNEP*


Photo: *UNEP*

*At least* **30% of all electricity produced on Barbados should come from renewable energy sources** *by 2029, according to the country's national energy policy.*

options evolving from *Barbados' Green Economy Scoping Study*, which has been internationally recognized for its participatory and visionary approach. Our national energy policy calls for at least 30 per cent of all electricity produced on the island to be generated from renewable energy sources by 2029, and a decrease in electricity consumption by 22 per cent. We now believe that we will reach those targets much earlier, not only because of the several projects currently in the pipeline, but based on the many incentives for renewable energy and energy conservation methods introduced in recent years.

The green economy development model is meant to assist us in forging innovative partnerships to help in preserving this planet for future generations. Moreover, Barbados is seeking to replicate, in other areas of renewable energy, what the country has done with solar water heaters. These comprise the most significant use of renewable energy in the country, having reached a penetration rate of 33.5 per cent in households. Barbados is one of the best-performing countries in the world in this regard. In 2008, when oil prices reached a record high of US$147 per barrel, the country installed 2,300 solar water-heating systems in a population of under 100,000 households and saved an estimated US$55 million. Furthermore, an energy-smart fund has been established to provide increased access to low-cost financing for the private sector complemented by investments in renewable energy in the public sector.

*In 2013 the United Nations still reported that environmental sustainability is under severe threat and that global emissions of carbon dioxide are accelerating.*

The projects to be executed in our roadmap within the next four years include constructing a waste-to-energy plant and converting biomass at a sugar factory into electricity that will collectively generate several megawatts of base-load electricity. The potential for an ocean thermal-energy conversion plant is also being explored in collaboration with SIDS DOCK and a local utility company. Further exploration of the marine resource is also the subject of studies that will advance the commercial and regulatory framework for other marine technologies to be exploited in the short term.

In a land-scarce country blessed with almost 365 days of sunshine, we simply cannot afford a situation where there are acres of roof space around the island which can be used as generators of electricity. Of particular interest, then, is converting the roofs of buildings across the island into mini solar electricity-generating power plants. It is estimated that approximately seven megawatts of solar electricity systems have already been installed.

This effort is being buttressed by the establishment of a new regulatory regime in the form of a new Electric Light and Power Act, which will, among other things, create a licensing regime for independent power producers, both at distributor and utility scale, and facilitate the sale of electricity to the grid. To support renewable energy and energy efficiency as one of the engines of the economy, the Government has established an extensive system of tax and other concessions and created opportunities for increased uptake of energy-efficient technologies.

Barbados is further seeking to restructure the economy, in part through the development of new skills in this area, with a view to the creation of hundreds of green jobs. Labour market analyses are being undertaken with the intention of establishing the short-, medium- and long-term needs for the green economy.

These are ambitious goals and we are cognizant that, as small island states, we need support. I therefore urge the international community to continue to partner with us in these efforts to assist in combating climate change and in preserving the environment for future generations. ▲

# What UNEA Means for SIDS

At the first ever United Nations Environment Assembly (UNEA), Achim Steiner, Executive Director of UNEP, noted the critically vulnerable position of SIDS: "Small island developing states . . . stand to suffer disproportionally from the effects of climate change and, in particular, sea level rise", he said. UNEA culminated with the adoption of 16 resolutions that encourage international action on major environmental issues by Member States, a number of which are directly pertinent to SIDS.

It is estimated that 10 to 20 million tonnes of plastic finds its way into the world's oceans each year, costing approximately US$13 billion in environmental damage to marine ecosystems. This includes financial losses incurred by fisheries and tourism as well as time spent cleaning up beaches. UNEA adopted a resolution on marine plastic debris and microplastics requesting UNEP to undertake a study to strengthen knowledge on measures and techniques to reduce microplastics in the marine environment. For SIDS, whose economies are largely sustained by marine tourism and fisheries, action to remediate plastic pollution in the world's oceans is crucial.

UNEA also adopted a resolution on chemicals and wastes, resolving to strengthen their management using a long-term integrated approach. The limited land area of SIDS, often coupled with their remoteness and increasing population density, places a premium on efficient waste management in these nations. Globally, pollution by chemicals and wastes affects SIDS through the contamination of their principal resources, the oceans. SIDS will benefit from any development that increases the efficacy with which waste is managed, both globally and locally, so contributing to protecting vulnerable marine resources.

In the ministerial outcome document of UNEA, ministers of the environment and heads of delegation reaffirmed their commitment to the full implementation of the Rio+20 outcome document. They called on the international community to foster and encourage the development of genuine and durable partnerships to address the environmental challenges faced by SIDS, in particular with relation to priority issues to be adopted at the upcoming Third United Nations Conference on Small Island Developing States in Samoa.

A draft decision on the illegal trade in wildlife was also presented at UNEA. Although not included in the outcome resolution, an additional call was made for the particular recognition of threatened marine species. Tuna fisheries contribute more than 10 per cent of GDP to SIDS in the Pacific and, in some islands, more than 50 per cent of their exports. As fish also form a major part of the diets of people on SIDS, any advance in the protection of marine ecosystems or species would be highly relevant to them.

Photo: *Bieke Depoorte Magnum /UNEP*

# John Ashe
# Seizing the Moment

*SIDS must use 2014's opportunities to identify concrete actions to safeguard their future*

**John W. Ashe**

*President of the Sixty-Eighth Session of the United Nations General Assembly and Permanent Representative of Antigua and Barbuda to the United Nations*

Over the last decade, some of the most majestic and beautiful places in the world, many located in small island developing states (SIDS), have been severely impacted by tropical storms, cyclones, flash floods and king tides. Homes have been swept away, families have been displaced and livelihoods lost. Many of the inhabitants of these islands—at the mercy of rising sea levels, coastal erosion and extreme weather events—are asking if their habitats, communities and culture will be gone forever. This kind of devastation, ever more commonplace, speaks to the effects of unchecked climate change, a phenomenon that United States Secretary of State John Kerry recently referred to as "a weapon of mass destruction."

While no man or woman, country or territory will be free from the impacts of climate change, SIDS are particularly at risk. Even without this existential threat, SIDS are especially vulnerable due to their geographic remoteness; limited physical size; relatively thin water lenses that are sensitive to sea level rise; high susceptibility to tropical cyclones, storm surges and droughts; lack of resources, both human and financial; high levels of debt; and limited natural resources. The expected impacts of the adverse effects of climate change only serve to add a particularly nefarious layer of vulnerability, which seems all the more cruel when one considers that the SIDS' share of global emissions is very low, that they have limited adaptive capacity and options, and that they face very significant costs for adaptation.

Despite growing scientific evidence and after years of negotiations, the international community has yet to take bold action to curb global emissions and address the long-term effects of climate change. To ensure a sustainable future—not only for SIDS, but for our planet—we, as an international community, will need to reach a legally binding agreement on climate change at the United Nations Framework Convention on Climate Change Conference of Parties to be held in Paris in 2015, an agreement that puts the world on a pathway to zero carbon emissions by 2050.

In this context, SIDS have been advocating a climate regime with ambitious mitigation action in order to maintain global warming below 2° Celsius—and ideally at 1.5° Celsius—above pre-industrial levels. Keeping warming below this level would require that concentrations of greenhouse gases in the atmosphere be limited to less than 350 parts per million (ppm) of carbon dioxide equivalent, which is the currently projected safe upper limit for carbon dioxide in our atmosphere.

As an integral part of addressing the climate change challenge, SIDS have also called for concrete adaptation measures, including finance, technology and capacity-building resources. They have also underscored the importance of the discussions on the development of an effective loss


*SIDS have called for emphasis to be placed on addressing key sectors—such as energy, water, tourism and agriculture—which are both central to their economies and climate sensitive.*

*Keeping* **global warming below 2° Celsius** *means keeping concentrations of* **greenhouse gas levels below 350 ppm** *of* $CO_2$ *equivalent.*

and damage mechanism with a strong financial arm that will enable them to face the short- and long-term impacts of climate change.

At national and regional levels, SIDS have called for emphasis to be placed on addressing key sectors—such as energy, water, tourism and agriculture—which are both central to their economies and climate sensitive. They have also noted that, with their small size and populations, they constitute an ideal environment to pioneer green and sustainable projects that can be scaled up and replicated in other regions.

SIDS possess unique biodiversity and cultural heritage—and for most, tourism is a major economic activity, providing jobs and income and accounting for a significant share of GDP. Yet tourism can also be a source of environmental stress on limited and fragile natural resources. With its infrastructure often built on coastlines, this industry will be particularly vulnerable to the effects of climate change. The development of sustainable tourism models, including risk management strategies, will be critical to maintaining this important economic sector while preserving the environment.

Reducing SIDS' dependence on fossil fuels by developing sustainable energy sources is another important challenge. Sustainable energy policies and strategies will be instrumental in the transition towards green or low-carbon economies. Increased funding, capacity-building and technology will be needed to support the development of a sustainable energy sector.

Climate change mitigation and adaptation must also feature prominently at a cross-sectoral level. Recognizing that climate change and development are intrinsically linked—and the destructive power of climate change as a threat multiplier—is the first step towards developing appropriate national and regional development and poverty alleviation policies that both address the different dimensions of climate change and use risk management approaches in development planning. In this regard, there will need to be significant investments in national research and data systems in SIDS, which can inform sound policymaking and effective decision-making.

Many inhabitants of SIDS are also well aware that regional collaboration and partnerships offer useful opportunities

for them, among other things, to strengthen negotiating positions through pooling resources; create critical mass for capacity-building initiatives, research and development; attract mitigation and adaptation funding from the private sector and other non-traditional sources of financing; share best practices on adaptation and mitigation; and coordinate the response of regional specialized agencies in addressing climate change.

While the difficulties from climate change impacts are mounting, this year presents unique prospects for addressing them. SIDS and their challenges and vulnerabilities—and their comparative advantages and opportunities—are at the forefront of the international community's attention. We are now well into the International Year of Small Island Developing States, the first time an international year has been designated for a group of countries, and are seeing a variety of activities to raise SIDS' profiles. At the United Nations Conference on Small Island Developing States in Samoa, SIDS can forge new and innovative partnerships with private actors, developed countries and development partners. The Conference also provides an excellent opportunity for the SIDS to identify their priorities for the post-2015 development agenda, a framework that will guide global development for decades to come.

Given the immediacy of the challenges before them, the SIDS must use these opportunities to identify concrete actions to safeguard their future. ▲

Photo: *David Kirkland*

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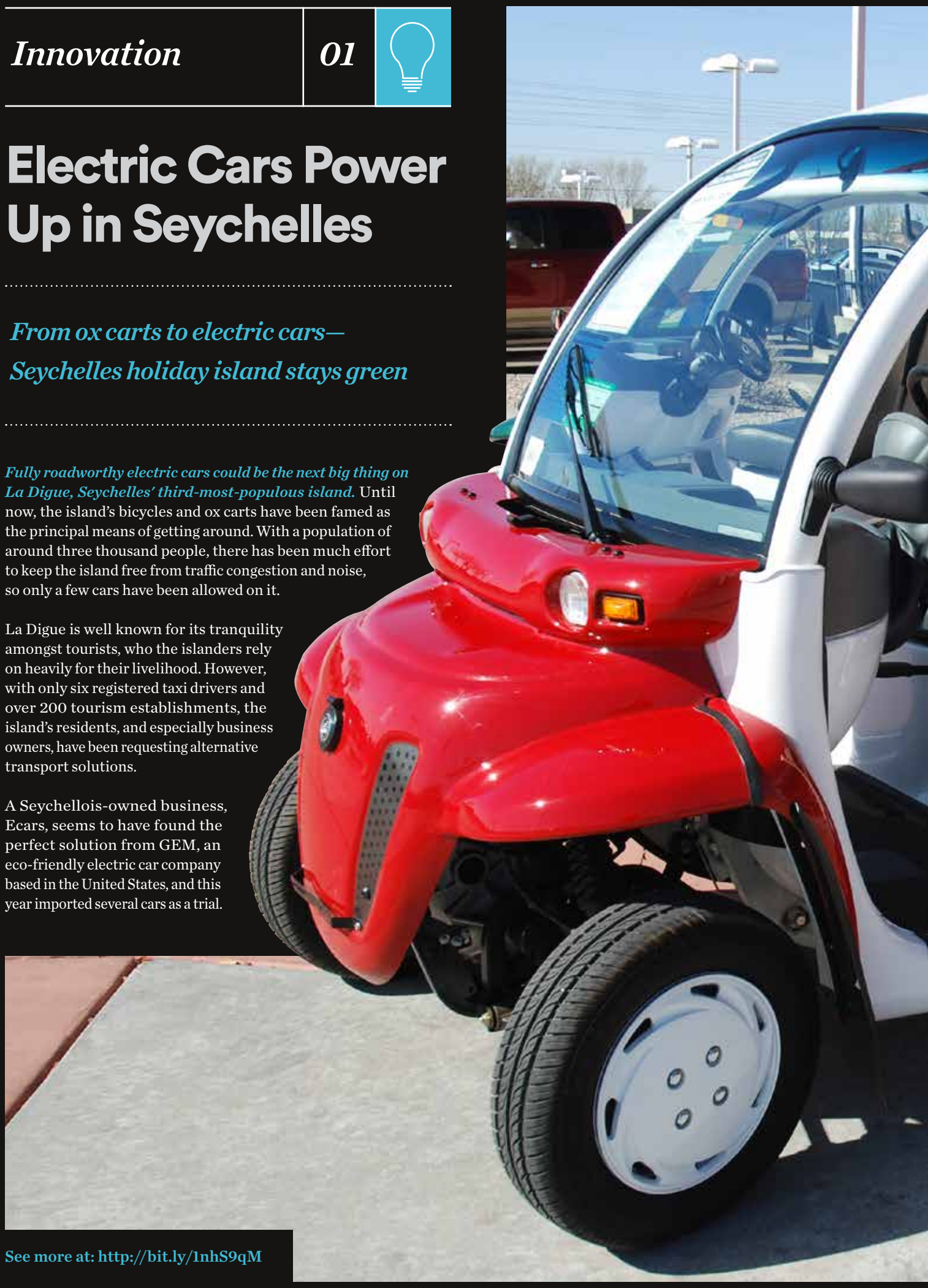
# Electric Cars Power Up in Seychelles

## *From ox carts to electric cars— Seychelles holiday island stays green*

***Fully roadworthy electric cars could be the next big thing on La Digue, Seychelles' third-most-populous island.*** Until now, the island's bicycles and ox carts have been famed as the principal means of getting around. With a population of around three thousand people, there has been much effort to keep the island free from traffic congestion and noise, so only a few cars have been allowed on it.

La Digue is well known for its tranquility amongst tourists, who the islanders rely on heavily for their livelihood. However, with only six registered taxi drivers and over 200 tourism establishments, the island's residents, and especially business owners, have been requesting alternative transport solutions.

A Seychellois-owned business, Ecars, seems to have found the perfect solution from GEM, an eco-friendly electric car company based in the United States, and this year imported several cars as a trial.



**See more at: http://bit.ly/1nhS9qM**

# Wu Hongbo

# Island Voices, Global Choices

*How will Samoan partnerships drive SIDS to sustainability?*

**Wu Hongbo**

*United Nations Under-Secretary-General for Economic and Social Affairs and Secretary-General for the Third International Conference on Small Island Developing States*

The year 2015 will be one of global choices. The international community must agree on a new development agenda for the following period, and it will meet to finalize a new global climate change agreement. Small island developing states (SIDS) have particular vulnerabilities that must be considered when these global choices are made. But they are also the source of solutions in adapting to change that has already happened. So, besides considering their vulnerabilities, we need to listen, learn and emulate their resourcefulness.

The Third International Conference on Small Island Developing States involves all Member States of the United Nations, as well as United Nations agencies, as is reflected in the Conference slogan, "Island voices, global choices". Many issues that will be addressed at the SIDS Conference are central to the post-2015 development agenda. Indeed, it is a once-in-a-decade opportunity for the world's leaders to focus critical attention on a group of countries that remain a special case for sustainable development. What happens with these small islands has global effects. To this end, the Conference will ensure that island voices are heard loud and clear.

SIDS have made less progress than most other groupings—or even regressed—in meeting the Millennium Development Goals, especially in regard to poverty reduction and debt sustainability. World leaders must, therefore, reaffirm their commitment to the sustainable development of SIDS, not only through words, but through actions. Multi-stakeholder partnerships will be at the heart of this conference because sustainable development can only be achieved with a broad alliance of people, governments, civil society and the private sector all working together. The Conference theme, "Sustainable development of SIDS through genuine and durable partnerships," reflects this.

Six multi-stakeholder partnership dialogues will be held in parallel to the plenary sessions. They will be on sustainable economic development; climate change and disaster risk management; social development in SIDS, health and non-communicable diseases, youth and women; sustainable energy; oceans, seas and biodiversity; and water and sanitation, food security and waste management.

I anticipate that governments, businesses and civil society organizations will announce major new commitments and initiatives on a range of issues that will help advance the economic, social, and environmental well-being of SIDS. The issues to be discussed are many in number and need to be addressed urgently.

Sea level rise and other adverse impacts of climate change continue to pose a significant risk to these island nations and to their efforts to achieve sustainable development. For many, they represent the gravest of threats to their survival and viability. While these "sea-locked" nations represent a small physical land mass and population, their surroundings—the oceans—occupy three quarters of the planet and are the world's most important shared resource. They contain nearly 200,000 identified species—but actual numbers may lie in the millions. Oceans and seas are the primary regulator of the climate and an important sink for greenhouse gases. And marine-based tourism and fishery earnings are important economic factors for SIDS.

Yet, despite our dependence on oceans and seas, we are not doing a good enough job in conserving, protecting and sustainably managing their resources. Over-exploitation, alien invasive species, marine pollution, and illegal, unreported and unregulated fishing—as well as increased sea

*Unemployment is a major concern in SIDS, especially for youth, and gender inequality and poor access to good-quality education affect many islands.*

Photo: *udeyismail / Shutterstock*

Photo: *Shutterstock*

*The* **oceans contain at least 200,000 identified species**, *but actual numbers may lie in the millions.*

temperatures, sea level rise, ocean acidification and criminal activity—hamper the conservation and sustainable use of oceans, seas and their related ecosystems. I am confident that Member States at the Conference will live up to the expectations of island populations by taking specific, forward-looking actions in support of healthy and productive oceans and seas. We must also be sure to learn from SIDS in areas where they have shown strong leadership, such as in making efforts to adapt to climate change and establishing marine protected areas.

Much of the attention on SIDS has been directed to such ecological vulnerabilities. To a significant extent, it is these inherent and particular vulnerabilities that make for the special case of their sustainable development—but they often exacerbate other social, economic and environmental problems. SIDS are characterized by smallness, a feature which gives rise to a number of economic disadvantages, such as a narrow resource base and dependence on a limited number of goods and services for exports, high import dependence, small domestic markets, reliance on export markets, and limited ability to achieve economies of scale.

With a few exceptions, SIDS are highly dependent on imported fossil fuels for meeting their energy needs, particularly for electricity generation and for transport. Given their distance from global markets and their multi-island features, these small island nations often face much larger transportation requirements and costs than other countries. And the unsustainable debt suffered in the after-effects of the global financial crisis is a heavy burden. The Conference will need to come up with answers as to how these problems can be addressed.

The social issues that island populations face also need to be tackled. Unemployment is a major concern for people in SIDS, especially youth. Gender inequality and poor access to good quality education are problems affecting many islands. Non-communicable diseases are widespread in some SIDS, becoming the major cause of premature death and creating a human, social and economic crisis. Yet, in many ways, the traditional knowledge and unique culture of SIDS can serve as enablers for sustainable development and needs to be recognized as such.

These are just a few of the many issues that the Conference will have to address. It provides a crucial opportunity to mobilize all sectors of society to identify solutions to these challenges, including innovative technologies and business practices that will help achieve, among other things, equitable growth, social well-being, and a low-carbon economy—bringing new opportunities to benefit everyone.

With its outcome—the SIDS Accelerated Modalities of Action (S.A.M.O.A.) Pathway—the Conference will seek to articulate how SIDS and their partners will transition to a more sustainable developmental path, adapting to climate change while providing a decent standard of living for all with lasting economic growth. It is vital for the post-2015 development agenda to take into account the particular needs of SIDS so as to ensure that no one is left behind. ▲

# UNEP at Work
# Green Tourism and Climate Change

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Tourism is a vital sector of the economies of most SIDS. In fact, for more than half of SIDS, it is their largest source of foreign exchange. Tourism receipts represent more than 30 per cent of their total exports. This compares with a world average of just over five per cent, according to the World Bank.

Given the sector's dependence on natural resources and the huge role it plays in both employment and economic growth, it is a priority area for the promotion of UNEP-driven green economy initiatives. Greening tourism requires a shift across the entire industry with regard to implementing policies, practices and programmes that embrace sustainability.

Under the auspices of UNEP, the Global Partnership for Sustainable Tourism has been active in this regard and UNEP has brought a number of SIDS-specific policies to the table.

Climate change presents one of the most significant challenges to SIDS and the tourism sector on which they so heavily depend. Consequently, UNEP hosts a number of climate change-related networks, which are also focusing on developing SIDS-specific solutions, such as the Climate Technology Centre and Network and the Global Adaptation Network.

These are providing information specific to SIDS, such as how the severity of sea level rise, both projected and observed, will be different depending on whether the islands are in the Pacific or Atlantic.

Rising sea levels have an obvious and immediate effect on SIDS, as do natural disasters partly caused by global warming. For example, a 50-centimetre rise in sea level will result in Grenada losing 60 per cent of its beaches, while a one metre rise would inundate Maldives.

The Intergovernmental Panel on Climate Change estimates that by 2100 global warming could lead to an average sea level rise of up to 1.2 metres, which would make many other SIDS, including Kiribati and Tuvalu, uninhabitable. Thousands of people on other islands would be made homeless.

While the global average of sea level rise is 3.2 mm per year, the island of Kosrae, in the Federated States of Micronesia, is currently experiencing a rise of some 10 mm per year. The tropical Western Pacific, where a large number of small islands are located, experienced sea level rise at a rate of 12 mm per year between 1993 and 2009, four times the global average.

In the Atlantic, the water is pushed to its western side and accumulates there due to the rotation of the Earth. When the water

Photo: Shutterstock

With few exceptions, Small island developing States share a number of unique characteristics which affect their ability to promote sustainable development. These include their small size, remoteness, narrow resource and export base and an acute vulnerability to global environmental challenges, most notably climate change, sea level rise and natural and environmental disasters.

However, SIDS are also home to 62.3 million people and are custodians of some 30 per cent of the world's largest economic zones. They also play an important role in protecting the oceans, which provide sustenance for millions of other people and are critical to human well-being. Rising poverty levels, rising debt levels, limited resources, overfishing and threats to food security compound these problems.

UNEP is active in helping to meet these challenges through a range of initiatives and programmes in SIDS.

*See more at:*
*www.globalsustainabletourism.com/en/*
*www.unep.org/climatechange/ctcn*
*www.ganadapt.org*

then moves into the Caribbean it is forced more towards the western coast—the resultant estimated sea level rise is then three times the global average.

SIDS themselves add little to the problem of climate change but risk paying some of the highest prices. The combined annual carbon dioxide output of SIDS accounts for less than one per cent of global emissions. Climate change adaptation has been identified as a top priority for SIDS, but a lack of financial resources is a major obstacle. The capital cost of sea level rise in the Caribbean community countries alone is estimated to reach US$187 billion by 2080 if things stay the same.

Climate change may also cause coral bleaching to become an annual occurrence resulting in further losses in tourism revenue. Dominica has reported that 50 per cent of its corals are bleached, and coral bleaching in Tobago affected an average of 66 per cent of its hard corals.

# Marlene Moses

# Star Opportunity

*Can SIDS grab the chance they have?*

**Marlene Moses**

*Chair of the Alliance of Small Island States*

"The stars are aligned for small island developing states." These words, spoken last year by a distinguished colleague, now the Foreign Minister of Saint Vincent and the Grenadines, well describe the rare chance we have this year to improve the quality of life for SIDS—and the obligation we have as an international community to seize it. A confluence of events provide an opening to bring SIDS' economies and communities into the twenty-first century and to help end the cycle of poverty that for too long has prevented our people from reaching their full potential.

The year began with the United Nations declaring 2014 the International Year of Small Island Developing States; the first time a group of nations has been so recognized. At the United Nations headquarters in New York, work continues on the evolution of the post-2015 development agenda. And the Third International Conference on Small Island Developing States in Samoa is, of course, an unparalleled occasion to put the countries on a path to realize their sustainable development goals.

But we know the challenges are great and that the opportunity is fleeting. A recent report from the Intergovernmental Panel on Climate Change confirmed what SIDS have known for years: we are uniquely vulnerable to climate change, a challenge that is making it harder and harder for us to build sustainable economies and lift our people out of poverty.

Sea level rise, degradation of the fisheries and coral reefs we depend on for food and income, threats to our food and water security, and other impacts are increasingly inhibiting our ability to plan and develop for the future. We also know that the longer we wait, the harder (and more costly) it will become to act. Yet our vulnerability does not relegate us to continuous dependency. Finding innovative ways to adapt and thrive in extreme environments defines our history, and is as relevant today as ever before.

Last year, some 2,000 solar systems were installed in homes across many of Solomon Islands' most remote villages, replacing dirty kerosene lights and providing enough power for electrical appliances. The Indian Ocean nation of Mauritius, endowed with abundant sunshine and rainfall, now generates about 15 per cent of its electricity by using a by-product of sugarcane known as bagasse. It has plans to increase the renewables in its energy portfolio to at least 35 per cent by 2025. And the island of Dominica, in the Caribbean, expects geothermal energy development efforts to slash electricity bills by up to 40 per cent in the coming years and make it a net exporter of power by 2020. Many other projects show equal promise in islands elsewhere around the world.

Of course, climate change and sustainable development are too big for us to tackle on our own, and the solutions we bring to bear must go beyond the energy sector. But we know that anything is possible when we combine our local knowledge and determination with adequate support from our partners.

To guide our work, SIDS have identified three essential pillars of an effective sustainable development framework: climate change, oceans and seas, and means of implementation. These are inextricably connected and we cannot achieve our goals unless we address them systematically. I already have touched on the impact climate change is having on our ability to develop, and

*In 2013,* **200,000 solar systems were installed in homes across Solomon Islands,** *replacing dirty kerosene lights and providing enough power for electrical appliances.*

the important role marine ecosystems play in our economies. But I also want to underscore the importance of the third pillar, implementation. After all, the theme of the Samoa conference is "genuine and durable partnerships"—and we know that fully achieving sustainable development will require sustained cooperation and sustained support. It will also demand a lasting commitment to engendering true independence in SIDS by implementing projects that are rooted, from start to finish, in trust and mutual respect.

We have done well to listen to each other's priorities and constraints in these negotiations. Going forward, we must continue to be clear about what is most important for us—and, in turn, our partners must assess whether or not they are truly able to deliver. Both must be willing to make changes and adjust course when projects are not working.


Photo: *Shutterstock*

*We must continue to be clear about what is most important for us—and, in turn, our partners must assess whether or not they are truly able to deliver.*

The stars maybe aligned for SIDS, but the fate of all communities in all places rests on our shared responsibility to make sustainable development work. For, in a carbon-constrained world, where access to energy determines the health and prosperity of every one of its citizens, it is no exaggeration to say we all inhabit the same island. ▲


Photo: *David Kirkland*

# Explorer Assists Marine Research

## *How did Fabien Cousteau collect three years of marine data in a month?*

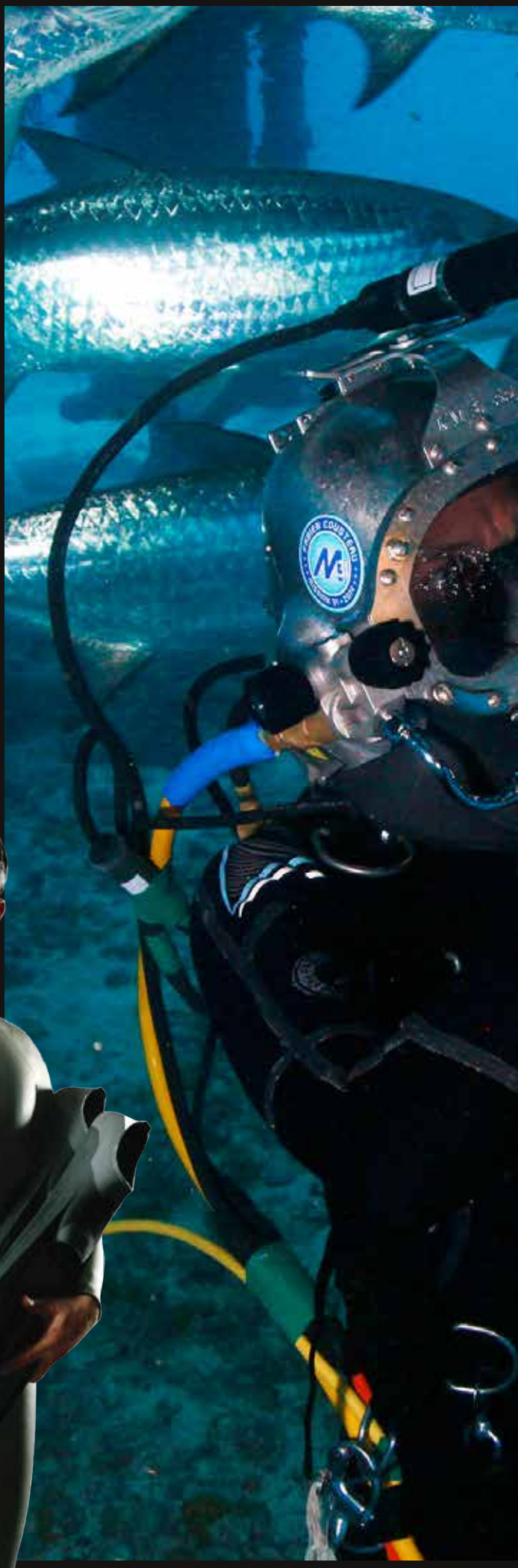
***The grandson of famed ocean explorer Jacques-Yves Cousteau finally came up for air in early July after spending 31 days under the sea,*** setting a new world record which could have a major impact on marine science.

Fabien Cousteau spent one month inside an undersea laboratory off the Florida Keys to break the half-century-old record set by his grandfather. The mission had the aim of building awareness about the need to protect oceans, and the team of scientists involved studied climate change, ocean acidification, plastics pollution, decline of biodiversity, and predator-prey relationships.

Cousteau, 46, and his colleagues also took their experience directly into classrooms, museums and aquariums across the globe, with more than 50 educational Skype calls. The mission highlighted how little is known about the world's oceans; during their month underwater the team collected data that would normally take three years to amass.

Spending so much time at pressure affected the team of scientists and filmmakers' sense of taste and resulted in numerous sinus and ear infections. Cousteau also lost three kilograms in weight, citing the body's need to stay warm as the reason for burning so many calories. The extended stay 19.2 metres below the ocean's surface necessitated 16 hours of decompression in the school-bus-sized laboratory to help the team avoid getting the bends.

In 1963, Jacques-Yves Cousteau and a half dozen divers he dubbed "oceanauts" spent 30 days inside an undersea laboratory called Conshelf II near the Port of Sudan. "There are a lot of challenges physically and psychologically," said Fabien, who was born in Paris and grew up on his grandfather's ships, Calypso and Alcyone. "The benefit is that the backyard is infinite."



Photos: *Kip Evans*

# Ronald Jumeau

# No Island is Alone

*SIDS—are they barometers of the world?*

**Ronald Jumeau**

*Ambassador for Climate Change and Small Island Developing State Issues, Seychelles*

Now is the time. If you are going to do anything for SIDS—whether in combating climate change or assisting our sustainable development—do it this year.

This year, 2014, is the International Year of Small Island Developing States—the first time the United Nations has ever dedicated a year to a specific group of countries. In September the United Nations holds its Third International Conference on SIDS, hosted by Samoa, following the first conference in Barbados in 1994, and the second in Mauritius in 2005. What makes Samoa stand out is that it takes place in the same month as the United Nations Secretary-General's Climate Summit in New York, on the eve of the launching of the post-2015 development agenda and the Sustainable Development Goals, and on the road to the 2015 climate agreement in Paris—as well as during the International Year of SIDS. So if you are going to do something to help us tackle climate change, or if you are going to partner with us in our sustainable development efforts, do it now.

It may be the year of SIDS, but fundamentally this is about all islands. When we, SIDS, fight for our countries, we also fight for all island territories, peoples and communities everywhere. There is so much at stake for the people and communities of all the world's small islands that the need for action is imminent. As Agenda 21 stated back in 1992: "Small island developing states, and islands supporting small communities are a special case both for environment and development. They are ecologically fragile and vulnerable. Their small size, limited resources, geographic dispersion and isolation from markets place them at a disadvantage economically and prevent economies of scale."

Two decades later, small islands remain fragile and vulnerable, not just ecologically, but economically. We have overcome many hurdles in building nationhoods, with the help of our partners, only to face even more daunting challenges to our fragile economies in climate change, which threatens the very existence of some SIDS, and a weak global economy which could roll back our achievements.

Min Zhu, the International Monetary Fund's Deputy Managing Director, noted last year that most small states were both prone to natural disasters and particularly susceptible to climate change. What he called "micro-states" in the Caribbean and the Pacific suffered annual costs equivalent to three to five per cent of GDP through natural disasters; and vulnerability to climate change will worsen unless small island countries and territories get the assistance our fragility requires. It is a sad reality that the post-2015 development framework will have to cater for relocation of small islands threatened with submergence, as whole countries begin to disappear off the face of the Earth.

Yet, out of small islands come big ideas. The boldness and resilience of islanders is unmistakable. While we face

Photo: *Shutterstock*

## *No island is alone, no matter how isolated it may feel. Through working together and learning from each other, amazing things can happen.*

**Seychelles is swapping US$80 million** *of public debt to turn* **30% of its Exclusive Economic Zone into marine protected areas.**

immense challenges both now and in the future, we refuse to be victims and continue to strive for new ways to help ourselves. The theme of the Samoa Conference is "the sustainable development of small island developing states through genuine and durable partnerships. Seychelles strongly backs this theme because this is exactly what we are looking at—public-private-civil-society partnerships—to address some of our key sustainability challenges.

As SIDS have graduated to middle-income status and higher, we have lost concessional official development assistance, and this has led to very high debts as a result of commercial borrowing. Seychelles is no exception. Tweaking the concept of debt-for-nature swaps we—in partnership with the Nature Conservancy—are currently swapping some US$80 million of public debt to turn 30 per cent of our 1.37 million square kilometres (529,000 square miles) of exclusive economic zone (EEZ) into marine protected areas. Half of that, 15 per cent of our EEZ, will be made up of no-take zones. As our sea territory is 3,000 times bigger than our land area, this debt swap has the potential to create vast changes to Seychelles' future environmental and oceanic landscape. It will also release millions of dollars in foreign exchange for our sustainable development efforts.

As a recent article noted: "The stars have aligned for island states," but this opportunity can only be utilized when we collectively fight for sustainability. We face similar challenges and have experiences and creative ideas to share. No island is alone, no matter how isolated it may feel. Through working together and learning from each other, amazing things can happen. One such thing is the Micronesia Challenge. This inspired the Caribbean Challenge Initiative and then both together inspired our country and East African neighbours to start working on our own Western Indian Ocean Coastal Challenge.

The Global Island Partnership (GLISPA), whose Steering Committee I chair, is organizing a high-level event in Samoa on "building resilient and sustainable island communities through innovative partnerships". GLISPA—a voluntary gathering of islands (irrespective of their political status), countries with islands, friends of islands in the United Nations, and global non-governmental communities—is, through its Island Bright Spots initiative, demonstrating how islands are taking action and showing the way to effectively conserve their biodiversity as a means to sustainable development, while building their resilience to climate change.

Now is the time for us to rise up as an international community in support of islands. The only thing greater than the challenges faced by island states is the opportunity to do something about it. Showing support for islands is showing an understanding that what happens to SIDS will happen to our whole planet, and that action protecting them extends far beyond our small countries. Islands are joining together to raise our collective voice for the needs of countries in vulnerable situations. We are doing what we can to help ourselves and each other find island solutions to island challenges. The Samoa Conference is a call to the rest of the world to help islands help themselves. We invite you to join us in this exciting, and essential, process. ▲

# UNEP at Work

# Barbados Spearheads a Low-Carbon Economy

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On the occasion of last June's World Environment Day, Barbados pledged cooperation with other SIDS, particularly in the Caribbean, in scaling up their efforts to move towards a low-carbon, resource-efficient economy. Like many SIDS, Barbados is facing daunting macroeconomic challenges exacerbated by the hangover of the global economic and financial crisis, in addition to adapting to the impact of climate change. To strategically advance its green economy, the country has spearheaded a three-year effort to take an in-depth look at five key sectors—agriculture, fisheries, tourism, buildings/housing and transport—as well as the cross-cutting issues of waste, water, energy and land.

The final report, *Barbados' Green Economy Scoping Study*, confirms that despite efforts to create the right national policies, more public and private investment is needed in key economic sectors, along with education and changes in consumer behaviour, to make the transition to a green economy.

"A green economy approach offers opportunities for managing natural capital, diversifying the economy, creating green jobs, increasing resource efficiency, and supporting poverty reduction and sustainable development," said Achim Steiner, Under-Secretary-General of the United Nations and Executive Director, UNEP.

"Barbados has long been a leader in the Caribbean region in this realm, and it is playing an important role in inspiring other small island developing states by sharing its strategies and lessons on this journey," continued Mr. Steiner.

The study involved extensive consultations with stakeholders in each of the key sectors, and these outcomes are also reflected in the recommendations. For example, the report finds the following:

- Greening the Caribbean, which is the most tourism-dependent region in the world, is no longer an option but an imperative. Opportunities for growth include marketing Barbados as a green destination, developing heritage and agro-tourism, and creating partnerships for promoting marine conservation.
- Increasing the utilization of clean technologies and creating better collaboration on transboundary marine jurisdictions and resource use in the region could bring added value to fisheries.
- Investing in restructuring the sugar industry, which has been contracting for three decades, and adopting and promoting organic agriculture could also create new avenues for growth.
- Switching up to 29 per cent of its energy to renewables could save Barbados US$280 million by 2029.
- Creating new policies and investment could ensure more efficient fuel performance, better air and noise pollution standards, improved traffic management, and mixed modes of transport on the island, as well as contribute to the creation of green jobs.

Photo: *UNEP*

*Barbados, which recently endorsed a green economy roadmap, is leading the way for small island developing states in the transition to a green economy.*


Photo: *Shutterstock*

Photo: *UNEP*

Photo: *UNEP*

The study was conducted by experts from government; the University of West Indies, Cave Hill Campus; and UNEP, along with numerous other national and regional experts. It identifies nine key policymaking areas that are needed for greening the economy and outlines several elements for creating a nationwide green economy roadmap. These include:

- Empowering the country's world-renowned social partnership—made up of representatives from government, labour and business—to take more overall responsibility for the country's green economy plans;
- Establishing a set of operational principles for policy development, education and monitoring and evaluation;
- Creating more support for private sector initiatives to advance the country's transition;
- Developing a set of metrics that can drive the progress towards a green economy;
- Promoting SIDS-SIDS knowledge transfer of green economy policies and practices, as well as building capacity in each of the key sectors and in new green industries.

By implementing the recommendations in each of the key sectors, the study concludes that the transition to a green economy will not only support environmental sustainability, but also promote economic diversification, new business opportunities and job creation.

# Liz Thompson Financing Change

## *Why SIDS need a REDD+*

**Liz Thompson**

*Former Minister of Energy and Environment, Barbados, now Special Advisor to the President of the United Nations General Assembly*

Describing climate change as "the defining challenge of our generation", United Nations Secretary-General Ban Ki-moon has noted its disproportionate impact on SIDS in the AIMS (Atlantic, Indian Ocean, Mediterranean and South China Sea), Caribbean, and Pacific regions. Their populations collectively contribute less than one per cent of total greenhouse gas emissions; yet they are on the front line of the fight to halt the progression of climate change.

The first international SIDS conference, in 1994, gave birth to the Barbados Programme of Action, initiating special recognition within the multilateral system of SIDS' "peculiar characteristics and vulnerabilities"—including ecological and exogenous economic shocks, geographic remoteness, limited land space, small populations, inability to achieve economies of scope and scale, social stresses and weak institutional capacity.

Invariably, 30 per cent of SIDS' populations live less than five metres above sea level and 80 per cent within close proximity to coastlines. Their very nature and lifestyles make them highly dependent on environmental services. Ninety per cent of their economic activity derives from imported fossil fuels, for which they pay some of the world's highest energy prices. Although burdened by high debt-to-GDP ratios—for Saint Kitts and Nevis as much as 160 per cent of GDP—classification as middle-income countries excludes many SIDS from concessionary financing.

Calls from SIDS to hold global temperature increases at 1.5° Celsius above pre-industrial levels—and not compromise at 2° Celsius—arise from their legitimate and urgent concerns. Climate change impacts compel them to focus their adaptation, mitigation and financing measures to address warming sea temperatures, rising sea levels, decreasing pH, coastal damage and inundation. Many, like Maldives, are literally sinking. They also face increasingly frequent and intense extreme weather events, such as Hurricane Ivan, which wiped out 90 per cent of Grenada's housing and 200 per cent of its GDP within a few hours in 2004.

High and urgent climate change financing costs, estimated at billions of dollars annually, mean that a SIDS-specific carbon-financing instrument is needed. The growing "green" trend for development indices to capture more than predominantly economic factors—and the rising use of environmentally based accounting and evaluation tools, such as the Wealth Accounting and Valuation of Ecosystems Services (WAVES), the System for Environmental-Economic Accounting (SEEA) and the Economics of Ecosystems and Biodiversity (TEEB)—demonstrate why SIDS must pursue more effective means of assessing their natural capital.

Oceans and seas cover 70 per cent of the Earth's surface, support livelihoods, and are effective carbon sinks and important sources of food, biodiversity and minerals. With improving technologies, oceans and seas provide immense potential for natural resource extraction and bioprospecting and provide the next frontier of economic growth. They are central to SIDS' society, economy, environment, culture, way of life and development. In light of evolving global environmental and development metrics, what tools would best evaluate SIDS' national patrimony, natural resources and marine potential in the context of providing capital to facilitate their climate protection and development prospects?

Natural capital assessments in SIDS must take account of their maritime resources, which greatly surpass their terrestrial ones. Tuvalu, for example, has 26 $km^2$ of land but an exclusive economic zone (EEZ) of 751,797 $km^2$. For Barbados, the figures are 432 $km^2$ and 183,436 $km^2$.

The REDD+ initiative was developed to provide financing and support for activities which reduce carbon emissions and militate against deforestation and degradation in

*Natural capital assessments in SIDS must take account of their maritime resources, which greatly surpass their terrestrial ones.*


Photo: *Shutterstock*

countries with substantial forest cover. Seas, like forests, are effective carbon sinks. So why is there no corollary marine mechanism for SIDS, particularly in regard to their large maritime territory?

**Hurricane Ivan wiped out 90% of Grenada's housing and 200% of its GDP** *within a few hours in 2004.*

Such a mechanism would benefit SIDS within new frameworks of natural resource accounting, in evolving environmental and development metrics, in effecting a transition to sustainable energy and a green economy and in mobilizing finance for research and activities related to climate change adaptation and mitigation, poverty eradication, and sustainable human development. It would also be compatible with the United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol which provide for wealthier parties to support technology transfer, provide new and additional financial resources and support activities and projects which address climate change impacts, including the protection of sinks in developing countries.


Photo: *Shutterstock*

**Tuvalu has 26 km² of land** *but an EEZ of almost 752,000 km².*

Such a mechanism's structure would include:

- A Board with representation from SIDS regions, organizations, development partners, and relevant United Nations, international and technical agencies;
- A Secretariat staffed by multidisciplinary experts;
- A blue investment fund or finance instrument to provide SIDS with the financial resources to manage and protect marine resources, ecosystems and coastlines.

It would have:

- Capacity for implementation, monitoring, measurement, reporting and verification;
- Provisions to protect the value of oceans and seas as the environmental lifeblood of SIDS and the planet;
- Capacity to track and monitor the health of seas and oceans and their effectiveness as sinks;
- Capacity to inventory and evaluate marine flora and fauna, including (but not limited to) coral reefs, kelp, seagrass beds and minerals;
- Knowledge platforms for sharing technology, research, best practices, data and information for decision-making;
- Compatibility with the UNFCCC and its instruments, including the Kyoto Protocol.

It would enhance SIDS':

- Capacity for partnership and collaboration with international development and financial institutions;
- Potential for complementary funding under the UNFCCC, including the Clean Development Mechanism, the Green Climate Fund, the Global Environment Facility and existing and new financing mechanisms;
- Opportunities for emissions-trading schemes and funding with Annex I and II Parties;
- Potential to maximize evolving green and non-GDP measurements such as TEEB, SEEA and WAVES;
- Delimitation of maritime boundaries with corollary assessments of the contribution of EEZs to national patrimony and wealth.

Ideally, the S.A.M.O.A. Pathway—the SIDS conference's outcome document—will include a suite of tangible, potentially transformative deliverables. One such output could be a Seas and Oceans Climate Development and Investment Mechanism to address social, economic, environmental and climate change impacts and contribute to the transition to green accounting systems and societies. This would significantly boost the natural capital accounts and assets of SIDS while augmenting their ability to mobilize new and sustainable financial resources for human development. And it would give genuine meaning to the language in the outcome document which urges SIDS to "engage in national and regional efforts to sustainably develop their ocean resources and generate increasing returns for their people." ▲

# UNEP at Work

# Green Fins Initiative Protects Coral Reefs and Drives Tourism

Photo: *Shutterstock*

About 420 kilometres south-west of Manila, in Bacuit Bay, lies the largest marine sanctuary in the Philippines. El Nido is a protected area of 45 islands and islets, covering a total of 903 square kilometres, boasting one of the most diverse ecosystems in the region.

El Nido is protected for its breathtaking geological formations, and unique flora and fauna, which include over 447 reef-building coral species, and 44 unconfirmed species—making it a scuba diving and snorkelling paradise.

In the last 10 years the number of tourists flocking to El Nido has more than tripled. In 2013 the famed marine sanctuary welcomed over 60,000 tourists to its white sand beaches, lush mangrove and ever-green forests, and magnificently sculpted jade islands.

Photo: *The Reef-World Foundation*

Across the Asia-Pacific region and the Indian Ocean, Green Fins provides the only internationally recognized set of environmental standards to give guidance and support for business owners and national authorities to promote best practices in sustainable tourism—particularly scuba diving and snorkelling. Coordinated internationally by the Reef-World Foundation and supported by UNEP and other partners, Green Fins ensures that diving companies and tour services are regularly assessed against the Green Fins environmental code of


Photo: *The Reef World Foundation*

Photo: *The Reef World Foundation*

conduct, and that business owners and staff are appropriately trained in environmental best practices. While tourism is a mainstay of El Nido's local economy, it is also an industry that is especially sensitive to reef conditions. Once coral reefs are damaged, their ability to support the many creatures that depend upon them is greatly diminished. As a consequence, those reefs and local areas lose their attraction as tourist destinations. According to the Head of the UNEP Coral Reef Unit, Jerker Tamelander, diving- and snorkelling-driven tourism is the "biggest driver of reef degradation."

It has been estimated by the Global Coral Reef Monitoring Network that the world has effectively lost 19 per cent of productive reef area, with another 15 per cent under immediate threat of loss. Approximately 500 million people depend on coral reefs for food, coastal protection, and income from tourism, including 30 million who are totally dependent on coral reefs for their livelihoods or for the land they live on.

# Climate Change Even Affects the Dead

Rising sea levels around Marshall Islands uncovered the graves of 26 soldiers from the Second World War earlier this year, it was revealed by the country's foreign minister, Tony De Brum.

Like a number of other small island developing states in the Pacific Ocean, Marshall Islands, an archipelago of 29 coral atolls, is extremely low lying and is critically vulnerable to changes in sea level.

"Now even the dead are being affected by climate change," said Mr De Brum at the United Nations Framework Convention on

Photo: *Bieke Depoorte Magnum / UNEP*

Climate Change conference held in Bonn in June. The skeletons were exposed after high tides battered the islands over a period of three months at the beginning of the year. Thought to be Japanese soldiers, their nationality was ascertained by the US Navy in Pearl Harbour before they were repatriated.

After being subjected to significant nuclear weapons testing in the years after the second world war, Marshall Islands now faces a much more insidious threat. The *SIDS Foresight Report,* published by UNEP in June, stated that sea levels in the region have risen by about 50 per cent more than the global average in the past 45 years. Evidence can be seen in the rising tides that are increasingly causing sea water to flood the land, ruining vegetation and staple crops such as breadfruit and coconuts.

The blunt evidence of rising sea levels in SIDS coincides with the presentation to the United Nations of a roadmap to avoid a climate catastrophe, which prescribes specific actions for the world's biggest economies to keep warming below 2° Celsius. *Pathways to Deep Decarbonization,* published in July, shows how individual countries can transition to low-carbon economies through energy efficiency, switching fuel types and replacing fossil-fuel-based electricity with renewable energy. SIDS contribute little to climate change but are greatly affected by changes in climate patterns. They are economically, environmentally and socially vulnerable to shocks over which they have little or no control and this places them at a distinct disadvantage compared to larger countries.

In Bonn, Mr De Brum commented that the response of the world's nations was too slow to afford help to his country. "We think they are [getting the message], but not quickly enough to climate-proof some of our more vulnerable communities," he said.

# Mariama Williams

# From Apia to Paris

*SIDS face great—but resolvable—challenges in both mitigating and adapting to climate change*

**Mariama Williams**

*Senior Programme Officer, South Centre*

The SIDS conference is taking place at an opportune moment—during the midst of a series of global processes (the post-2015 development agenda, the Sustainable Development Goals, and the Durban Platform negotiations of the United Nations Framework Convention on Climate Change (UNFCC)) that focus on defining the development and climate protection agendas for the foreseeable future. It provides a strategic opportunity for inputs from key stakeholders in all three regions of SIDS. Its outcome can have a powerful impact, most importantly on this year's UNFCCC Conference of the Parties in Lima, which, in turn, will be important for the new climate protection agreement in Paris in 2015.

Climate change—identified as the "greatest challenge to SIDS"—is big on the agenda, coupled with disaster risk management. It was also, of course, a staple item on the agendas of the first two conferences on SIDS. Yet, after twenty-plus years, it is not clear how significantly SIDS' vulnerability to climate change has been reduced or otherwise altered. In fact, some would argue that the situation has worsened, even while there have been significant positive shifts on many other items on the agenda of SIDS, such as those under the Millennium Development Goals framework. In some cases—as with exposure to rising sea levels and more extreme weather—this is only to be expected given there has been no dramatic global shift in addressing the drivers of these hazards. In others—such as adaptation to and building of climate resilience—progress seems to be slow, incremental and inadequate.

Not all disaster-related vulnerabilities and resulting impacts are intrinsically linked to the effects of climate change or geography. Some of the continuing deep and persistent structural economic vulnerabilities result from choices and decisions made by SIDS' governments, businesses, individuals and households, and many have not been adequately tackled over the last two to three decades. They include such core developmental issues as inequality, adequate housing and infrastructure and promoting and ensuring access to water, energy and sanitation for millions of people. Adequately addressing them will help reduce vulnerability to some of the effects of climate change.

Development itself remains a challenge for SIDS. Climate change—which brings serious and severe exogenous hazards—adds additional difficulties to endogenously determined, structural, long-term developmental challenges. Past and present choices will also determine whether SIDS adapt to climate change impacts or not.

As a whole, 26 per cent of land in SIDS is less than 5 metres above sea level—and is home to nearly 30 per cent of their almost 65 million people. The Intergovernmental Panel on Climate Change's Fifth Assessment Report re-affirmed SIDS' high vulnerability to sea level rise, increasing air and sea surface temperatures and changing rainfall, threatening the sustainability of all the islands. The impacts and risks of physical hazards are increasing. Wherever and whenever possible, adaptive capacity must be increased more than proportionately. Every opportunity to reduce vulnerability must be taken now, not in some far distant future.

SIDS, as a group, face loss of industrial capacities in such key areas as agriculture, fisheries, tourism, electricity generation,

*High and urgent climate change financing costs, estimated at billions of dollars annually, mean that a SIDS-specific carbon financing instrument is needed.*

Photo: *David Kirkland*

Photo: *Shutterstock*

*SIDS have committed to* **cut emissions by 45% in the next 18 years**.

distribution of food security, water scarcity, droughts, and changes to ecosystems (including loss of crucial ecosystem services). There is also potential for inundation of land, displacement, security issues and endangerment of human health. Such risks call for focused and consistent policies and actions on climate proofing and building climate resilience as an integral part of developmental planning. Development must adjust to, and factor in, climate change: it will not be the other way around.

These hazards pose particular challenges for SIDS due to their small size, limited resource base and low economic resilience—which predispose them to extreme exposure to high numbers of disasters, even as they address slow-onset climate hazards. Reducing disaster risks and impacts on lives and property requires preparedness, good management of land and other resources. Some climate-induced hazards—like sea level rise and ocean acidification—require longer-term planning: others—such as extreme events—need immediate and urgent disaster responses and adaptation projects and programmes. Actions on disaster risk reduction and climate change adaptation can reinforce each other through seeking both to reduce exposure to extreme weather events and to address slow onset events and other aspects of climate change adaptation. For SIDS there is little practical difference between disaster risk reduction and climate change adaptation. There are clear opportunities for using scarce resources and synergetic interactions to advance development, reduce the impacts of disaster and adapt and build resilience.

So SIDS must integrate disaster risk reduction and climate change adaptation within a framework of loss and damage. This will require a significant shift in the approach to and instruments of public investment planning—and a different approach to governance: one that strengthens coordination across different governance levels, works in partnership with the private sector and community groups, and pays effective attention to the underlying gender dynamics and different priorities of men and women.

*Over 20 countries have made commitments to reduce their emissions—***Dominica has pledged to be carbon negative, and Maldives carbon neutral,** *by 2020.*

SIDS also need to ensure the best cost-effective and sustainable adaptation—and reduce the risk of a policy or project, ostensibly designed to promote it, actually resulting in increasing risk or vulnerability (such as by increasing greenhouse gas emissions or placing a disproportionate burden on a vulnerable group). Governments and institutions must ensure that adaptation strategies are tailored and fine-tuned to each experience specific to SIDS so as to avoid such maladaptation. Though it is widely accepted that SIDS are different from other developing countries, less often discussed are the differences between them—and the localities and communities within them—that will require greater nuancing of adaptation to climate change.

Hence, adaptation strategy cannot be constructed around adopting a blueprint from elsewhere, but must be adapted to particular national circumstances. In many SIDS—especially those where livelihoods and economic value are tied to nature-based resources such as fisheries, forestry, agriculture, tourism and ecosystem services—there may need to be a greater focus on ecosystem-based adaptation than in many other developing countries. This is certainly so for Caribbean islands where, for example, coral reefs generate annual income of over US$3 billion through supporting fisheries, diving tourism and shoreline protection industries—but where about one third of them are threatened by fishing and shipping. SIDS therefore need to coordinate carefully with their international partners, as well as amongst themselves, through such initiatives as the Strategy for Climate Change and Disaster Resilient Development and by participating in global and regional adaptation networks.

There is already a growing network of activities between SIDS. These need to be strengthened and continued but space should also be created for complementary streams that take account of national and regional specificities. Whole-of-government multi-sectoral policy frameworks, and coordination between central and local government and localities, should bring their own needs, priorities and concerns to fine-tuning national adaptation strategies.

*SIDS should resist the implementation of technologies that may appear to be cheap but do not build on their comparative advantage and natural resources.*

Mitigation is also challenging for SIDS. They have a twofold imperative: to promote increased access to modern energy for those without it; and to reduce emissions and promote a transition to clean energy. Emissions from SIDS are still rising, and this needs more focused attention. Indeed, governments have begun to address this. Over 20 countries made commitments to reduce the level of emissions in their economies at a ministerial conference in Barbados in 2012. Some made quite remarkable ones, with Dominica pledging

Photo: *T photography / Shutterstock*

Photo: *Shutterstock*

**Oceans and seas cover 70% of the Earth's surface,** *support livelihoods, and are effective carbon sinks and important sources of food, biodiversity and minerals.*

to be carbon negative, and Maldives carbon neutral, by 2020. Overall, SIDS committed to cut emissions by 45 per cent in the next 18 years. SIDS also need to reduce fossil fuel use for the sake of their own development, due to their high dependence on imported oil and the havoc to their economies caused by the volatile and rising cost of energy. Yet, clean energy is not cheap. SIDS are fortunate to have access to hydro, ocean, geothermal, wind and solar power, but face constraints of size and scale efficiency.

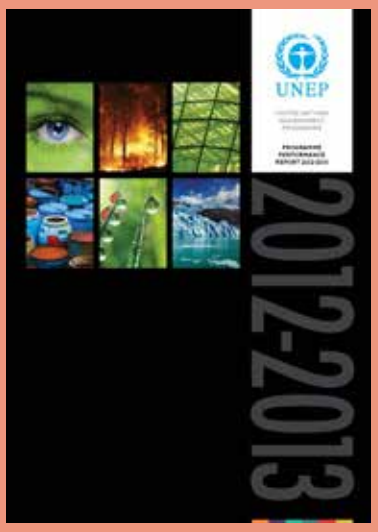
There needs to be much more focused attention on developing small-scale clean and renewable energy mechanisms as well as cross-regional large-scale ones. SIDS should resist the implementation of technologies that may appear to be cheap but do not build on their comparative advantage and natural resources, making them once again dependent on international markets.

They will have to use diplomatic and other power to ensure that international partners—and South-South cooperation—garner support for appropriate and affordable technology "development" (not just transfer) of an energy mix based on SIDS' natural endowments: sun, sea and water. This will also build SIDS' export capacity and economic diversification, and should be one of the core pillars of SIDS DOCK, the SIDS-SIDS sustainable energy initiative.

One of the greatest weakness in SIDS' otherwise very powerful, influential and effective climate diplomacy—under the umbrella of the Alliance of Small Island States (AOSIS)—is they have not yet received the flow of finance needed to undertake both mitigation and adaptation. They still far too often report serious difficulties in accessing available sources of climate finance.

So a critical focus of their diplomacy should be to ensure construction of a meaningful powerful and operational mechanism for loss and damage. They also need to be proactive in setting out target resource mobilization for the Green Climate Fund. Together with pushing for the highest mitigation ambition possible, such should be the priorities of SIDS (AOSIS)-UNFCCC advocacy. ▲

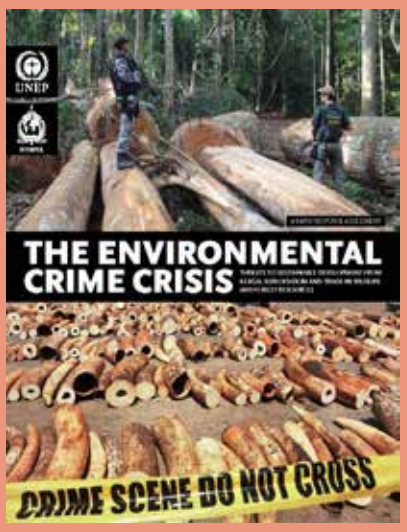
# UNEP Publications




## *UNEP Programme Performance Report, 2013*

The 2012–2013 biennium completed the implementation of the first medium-term strategy of UNEP. For the first time in the history of the organization, results-based management principles were fully applied throughout the programme cycle, from planning to monitoring and evaluation of implementation.

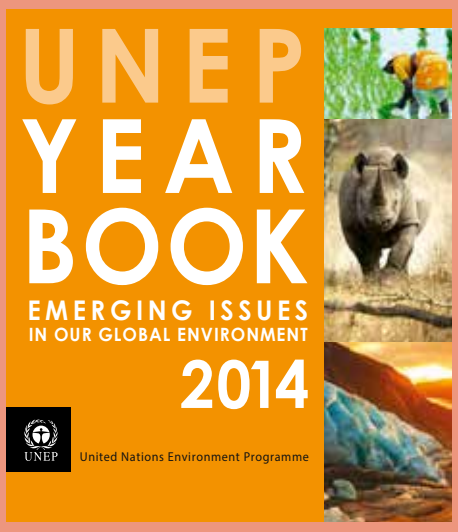
The report provides an overview of the performance of UNEP against its programme of work. The first section shows overall results of UNEP spending for the biennium and a summary of what has been undertaken. The report then goes into detail for every priority area of the programme of work, showing the results achieved and the resources used to realize them.




## *The Environmental Crime Crisis: Threats to Sustainable Development from Illegal Exploitation and Trade in Wildlife and Forest Resources*

This beautifully illustrated report covers the tragedies of wildlife crime, illustrating both the financial cost and the social and environmental impacts of wildlife crime throughout the world. The report gives many examples, grouped together by "product" and backed up with facts and figures, of the prevalent wildlife crimes that currently impact us.

It starts with national- and regional-level recommendations for combating wildlife crime, before giving well-illustrated, in-depth analyses of the causes and effects of each type of crime. An excellent and easily accessible read for anyone, from policymaker to the general public, on the huge significance that tackling wildlife crime is to the future of our societies.




## *UNEP Year Book 2014: Emerging Issues in our Global Environment*

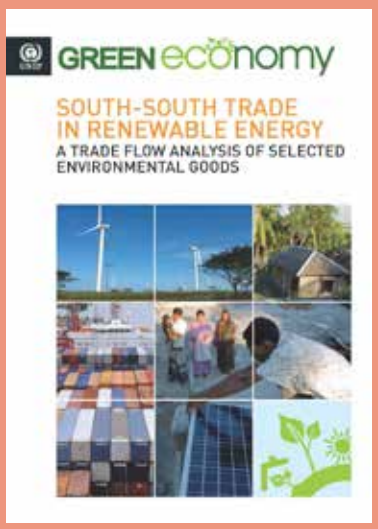
Ten years after the first year book in this series appeared, a special e-book anniversary edition—the UNEP Year Book 2014—presents a fresh look at 10 issues highlighted over the past decade.

The UNEP Year Book 2014 provides a multimedia experience that helps illustrate the environmental challenges we face today and some of the innovative solutions that have been created to solve those challenges. Video, animations, data visualization and stunning images from around the world help tell the stories.


## *Emerging Environmental Issues, 2013*

The monthly Global Environmental Alert bulletins from UNEP take the pulse of the planet and widely distribute the findings about environmental events and trends to the public. The bulletins use sound scientific investigation to reveal important environmental trends and connect them to policy by uncovering the links to past human activity and the potential for future action.

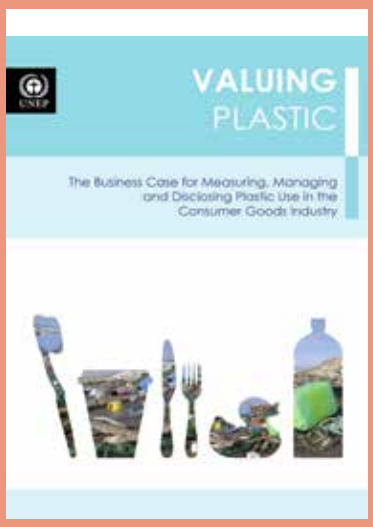
This 2013 Emerging Environmental Issues publication presents the 12 monthly bulletins in a single document, allowing readers to note and assess significant environmental events that took place that year. The Global Environmental Alerts are organized around the six themes of UNEP in 2013: environmental governance, harmful substances and hazardous wastes, ecosystem management, climate change, disasters and conflicts, and resource efficiency.




## *South-South Trade in Renewable Energy: a Trade Flow Analysis of Selected Environmental Goods*

This study analyses trends and opportunities for South-South trade in selected environmental goods, in order to assess the contribution such trade can make to a green economy transition.

The study focuses on South-South trade flows in several renewable energy products and their components, including solar photovoltaic cells and modules, wind turbines, hydroelectric turbines, biomass feedstock, solar water heaters and solar lighting equipment. Water filtering and purification equipment and environmentally preferable products, such as organic agricultural goods, are also considered.




## *Valuing Plastic: the Business Case for Measuring, Managing and Disclosing Plastic Use in the Consumer Goods Industry*

The objective of this report is to help companies manage the opportunities and risks associated with plastic use. It articulates the business case for companies to improve their measurement, disclosure and management of plastic use in their designs, operations and supply chains. In order to provide a sense of scale, the report sets out to quantify the physical impacts of plastic use translated into monetary terms.

This metric can be seen as the current value-at-risk to a company should these external impacts be realized internally through mechanisms like strengthened regulation, loss of market share, or increased price of raw materials and energy. This metric can also be used to help understand the magnitude of the opportunities, and the tangible benefits to stakeholders, including shareholders, of using plastic in an environmentally sustainable way.

*All UNEP publications are available online at*

**www.unep.org/publications**

# David Sheppard
# We Can Do It

*Island nations are taking the action needed to fight against climate change*

**David Sheppard**

*Director General, Secretariat of the Pacific Regional Environment Programme*

Climate change is already a major threat to the countries, communities and people of the Pacific, and the prospect is that it will become the major agent of change in the region. Its adverse impacts affect all economic, social and environmental sectors of our countries.

Although Pacific countries only contribute 0.03 per cent of the world's greenhouse gas emissions we are in the "front line" in bearing the brunt of such impacts. Development demands and carbon emissions in countries far from our shores are the main drivers of climate change and solutions to its root causes lie largely outside our control.

The Intergovernmental Panel on Climate Change's Fifth Assessment Report makes grim reading for our region. Sea level rise poses a widely recognized threat to low-lying coastal areas on islands and atolls: many islands and coastal areas could be lost. Global sea level rise could range from 0.28 m to 0.97 m by 2100. As the oceans warm, and expand, it will continue even after controls on greenhouse gas emissions are implemented. Seawater intrusion will degrade fresh groundwater resources, while rising sea surface temperatures will increase coral bleaching and reef degradation. Ocean acidification is likely to have severe impacts on coral reef ecosystems and associated marine and coastal resources.

The rate of warming over the next century is expected to increase. Extreme weather events, like storms and cyclones, are likely to be fewer but more intense. Annual average rainfall will increase in some parts of the region, with extreme rainfall events becoming more frequent; in other areas droughts may become more common. All of these threats imperil food security, livelihoods and the sustainability of coastal settlements and cities. Pacific island leaders have consistently outlined the urgency of climate change for our region. The Majuro Declaration for Climate Leadership, which they adopted in 2013, noted that it is the greatest threat to the livelihoods, security and well-being of the peoples of the Pacific and one of the greatest challenges for the entire world.

But they have also pointed out that Pacific countries are taking decisive action to adapt to climate change and to move to carbon-free economies through using renewable energy. As President Loek of Marshall Islands told the 2013 Forum Leaders Meeting: "In the Pacific we are doing more than waving our hands in distress," adding: "these actions send a clear message to the rest of the world that if we can do it, you can too."

Nowhere is this spirit of developing Pacific solutions to Pacific problems more apparent than in the Pacific Adaptation to Climate Change (PACC) project. Spanning 14 Pacific island countries and territories, this UNDP/GEF-funded regional project—coordinated by the intergovernmental Secretariat of the Pacific Regional Environment Programme (SPREP), in cooperation with local communities in the Pacific—is demonstrating real and tangible actions and impact on the ground.

PACC has developed practical approaches to adaptation to climate change in three key areas—coastal zone management, food security, and water resource management—and has led to many innovative initiatives. In Tuvalu, for example, it has supported providing community cisterns, linked with education and awareness programmes, to encourage better conservation and management of water. In Kosrae, in the Federated States of Micronesia, it has helped "climate proof" a road frequently damaged by flooding and erosion as a result of intensive rainfall: this will provide the infrastructure to help relocate families inland from the coast, away from the coastal erosion and frequent flooding they currently experience. PACC is also helping to ensure adequate food supplies to the community of Ontong Java in Solomon Islands, where saltwater intrusion and lack of soil nutrients has hit the production of root crops: new salt-resistant varieties are being trialled—and the trial plots have been designed to be energy efficient, low maintenance, high yielding and inter-connected, taking extreme events and climate change trends into consideration.

Photo: *David Kirkland*

*New* **salt-resistant varieties of root crops are being trialled to combat saltwater intrusion** *and lack of soil nutrients with assistance from the PACC project.*

**Pacific countries only contribute 0.03% of the world's greenhouse gas emissions** *but are in the front line of such impacts.*

PACC has been the Pacific region's most extensive climate change adaptation initiative; its success has been largely due to partnerships between communities and regional and national agencies. It has also seen Pacific governments applying science and local knowledge from villages and communities to develop the best possible adaptation decisions.

One of the many challenges identified over years of climate change work in the region is that many projects are implemented in silos. However, there are now excellent examples on how to overcome this. In Choiseul Province in Solomon Islands, a range of international, regional, national and local partners are applying a whole-of-island, "ridge-to-reef" common approach to climate change adaptation. Each implementing organization, with its own funds and specific objectives within the ridge-to-reef framework, operates to common goals coordinated by the Choiseul Integrated Climate Change Programme, as do national and provincial government agencies.

*An ecosystem approach places adaptation solutions in the hands of local people and uses traditional ecological knowledge.*

In Nauru, PACC is seeking to deliver practical water management solutions, while the Integrated Water Resources Management project provides an overarching national policy and action framework. Through the initiative of the Nauru Ministry of Commerce, Industry and Environment, the two projects are working closely together. They are sharing resources and information—assisted by joint meetings of their SPREP and Secretariat of the Pacific Community advisers—so as to reduce expenditures and, more importantly, break down silos and work cooperatively to ensure more effective delivery.

Other opportunities have been acted upon; still others are being considered. Under the renewable energy project, Pacific Islands Greenhouse Abatement through Renewable Energy Programme, implemented by SPREP and UNDP, Solomon Islands will implement a rural solar-powered telecommunications system, building on existing work by UNDP and the Secretariat of the Pacific Community. SPREP will begin implementing a project to reduce the vulnerability of Pacific villagers' livelihoods to climate change, and there will be opportunities to benefit from the installation of rural telecommunications to disseminate meteorological information to communities. It is important to recognize such opportunities for enhancing climate change implementation, and SPREP will continue to assist Pacific countries by stressing coherence and cooperation between complementary activities, even if they are implemented by different agencies or funded by different donors.

Ecosystem-based adaptation—which integrates sustainable use of biodiversity and ecosystem services in a comprehensive strategy—must play a critical role. Climate change undermines the capacities of many ecosystems to provide vital ecological services, such as clean water and air, and its impact will increase if other threats to the productive ecosystems of the Pacific are not addressed. Natural solutions such as replanting mangroves and revegetating stream banks and upper catchment areas reduce the negative effects of extreme events while supporting such resource uses as fisheries and sustainable harvesting of timber and medicinal or food plants: they are thus essential to Pacific peoples' livelihoods and cultures. Mangrove forests protect coastlines from storm surges, while also safeguarding breeding areas and habitat for fish, crustaceans and other invertebrate species. It makes sense to use biodiversity and the ecosystem services on which people depend for their livelihoods and social and economic security as part of an overall adaptation strategy.

Whereas infrastructure options often require outside expertise and external machinery, and involve high cost and maintenance, an ecosystem approach places adaptation solutions in the hands of local people and uses traditional ecological knowledge. A recent cost-benefit analysis for Lami Town in Fiji concluded that ecosystem-based adaptation had the highest benefit-to-cost ratio in responding to flooding and erosion vulnerability when compared to engineering and hybrid options. It is being increasingly implemented in the Pacific in conjunction with whole-of-island and ridge-to-reef approaches to adaptation. Long-term success depends on strengthening ecological and social resilience to climate change.

Existing approaches, like the PACC project and ecosystem-based adaptation, have delivered positive results but must be expanded and adapted for different contexts in Pacific countries. And approaches which build resilience, are multi–sectoral and involve a range of agencies and communities working in partnership, must be encouraged and increased. ▲

# Mobile Apps are Assisting Conservation

***Even handier technology is becoming available for ecosystem management, including for compliance and enforcement.***

***Can I Fish Here?*** A recreational fishing app, introduced by Parks Victoria in Australia, uses a phone's geolocational ability to show fishers whether they are inside a no-take zone, close to one, or safely clear of any boundaries.

Mark Rodrigue, programme leader for marine and coasts with Parks Victoria, says boundary awareness of marine protected areas has always been a challenge. "Marine managers have relied in the past on traditional methods such as markers on shorelines, in-water markers in areas that are relatively shallow and low energy, maps at key access points or in park publications, or other methods," he says. "While these tools are all useful and will continue to be used, they also have limitations and rely on the users being adequately prepared with maps or within visual sight-of-boundary marks." People who are caught fishing inside Victoria's no-take areas often claim to have no knowledge of the boundaries, says Rodrigue. "Since many people these days are using smart phones or devices, one of our marine rangers suggested using the fishers' phones to help them locate the boundaries."

California in the United States also offers a boundary awareness tool for its waters. Like the Victoria tool, it is designed for smartphones and provides positional information; technically, though, it is a web-based resource rather than a stand-alone app.

***See more at: http://bit.ly/1l0oIhq***


Photo: *Shutterstock*

*Beat the Microbead App.* More and more cosmetics contain tiny plastic beads. These microplastics are a hazard to our environment as, once washed off our faces, they enter marine ecosystems through our sewerage systems. There they are consumed by marine organisms and passed along the food chain. As humans are at the top of the chain, it is likely that we are also absorbing them.

It can be hard to determine if a product contains these microbeads but the North Sea Foundation (Stichting de Noordzee) and the Plastic Soup Foundation have developed an app to easily check. With it you can verify if an item contains microbeads by just scanning the barcode with your smartphone camera.

The app has localized product listings and new countries are continuously added. To date, comprehensive product lists for 19 countries have been produced, indicating for hundreds of products whether they contain microplastics, whether they contain microplastics but the manufacturer has agreed to phase them out within a given time frame, or whether they do not contain any microplastics.

***See more at: www.beatthemicrobead.org***


*SMART Anti-Poaching Software.* Debuted at last year's World Conservation Congress in South Korea, the SMART software tool allows for measuring, evaluating and improving the effectiveness of wildlife law enforcement patrols—both on land and at sea. SMART (which stands for Spatial Monitoring and Reporting Tool) includes a desktop application, training and implementation manuals, and web-based training materials. The entire package is free and open-source, allowing it to be modified to meet varied and changing needs.

"This characteristic of SMART means that add-ons can be programmed that could focus on marine-specific applications, such as environmental monitoring of sea surface temperatures," says Olivia Needham of the Zoological Society of London (ZSL). ZSL is part of a consortium of conservation organizations that developed the software; the group also includes the World Wildlife Fund, the Wildlife Conservation Society, Frankfurt Zoological Society, North Carolina Zoological Park, and the Monitoring the Illegal Killing of Elephants programme of CITES.

Consortium members aim to pilot SMART in various marine protected areas within the next year: ZSL will pilot the software at 34 community-managed marine protected areas in the Philippines; and the Wildlife Conservation Society will support the Belize Fisheries Department in using the software to centralize its enforcement data.

***See more at: www.smartconservationsoftware.org***

# Vasantha Chase
# Norma Fevrier
# Disastrous Consequences

*Social cohesion and citizen security are important tools in adapting to climate change*

**Vasantha Chase**

*Director, Chase Consulting Ltd, Saint Lucia*

**Norma C. Fevrier**

*Programme Officer, Organization of Eastern Caribbean States*

Climate change and variability—and their distressing effects—are increasingly seen in the greater frequency and intensity of natural hazards. These climate-change-related events are already profoundly impacting SIDS' geophysical, biological and socioeconomic systems, depleting national budgets, compromising livelihoods and exacerbating poverty. According to the Fourth Assessment Report of the United Nations Framework Convention on Climate Change, these natural hazards are expected to intensify in the future.

The Emergency Events Database, maintained by the Centre for Research on the Epidemiology of Natural Disasters, shows a clear increase in the number of natural disasters occurring in SIDS between 1970 and 2010. The United Nations Office for Disaster Risk Reduction reports that 187 disasters affected the Caribbean region, and over 110 hit the Pacific region, between 2000 and 2011. In addition, the World Risk Index, presented in the *2012 World Risk Report* of the United Nations University, identifies global disaster risk hotspots where high exposure to natural hazards and climate change coincide with very vulnerable societies: eight of the 15 countries with the highest risk worldwide are island states, with Vanuatu and Tonga occupying the top two positions.

There is an important relationship between climate change and variability, natural disasters, social cohesion and citizen security in SIDS. Climate change and variability are increasingly undermining human security. They will continue to do so by reducing access to, and the quality of, natural resources important for sustaining livelihoods and household welfare. Disasters strand people out of their familiar environment when public services are unavailable or severely disrupted. Recent evidence from hazard events in all SIDS regions indicates that fatalities—a permanent shock to a household's welfare—leave individuals orphaned and widowed at a time when community and extended family solidarity is not available. Climate change also undermines the capacity of SIDS to provide the opportunities and services that help people to sustain their livelihoods.

The current business-as-usual approach to the management of climate change provides significant potential for the creation of volatile environments (in which the poor compete for scarce resources), violence, conflicts and divisions between groups. It is beyond doubt, as it has been put, that the "disasters themselves are overwhelming and can lead to the erosion of social capital and demise of the community." This is already evident in SIDS where, during and after disasters, there is increased competition between households due to lack of access to food, water and electrical power, among other things. If SIDS' ability to provide law and order in such situations is compromised, this will also have implications for national and regional security.

As the impacts of climate change in SIDS become increasingly disastrous, cause the erosion of developmental gains, and disrupt the function of systems critical to human

Photo: *Art Phaneuf - LostArts / Shutterstock*

Photo: *masuti / Shutterstock*

## *Disasters themselves are overwhelming and can lead to the erosion of social capital and demise of the community.*

Photo: *Shutterstock*

*There is a clear* **increase in the number of natural disasters that occurred in SIDS** *from 1970 to 2010.*

survival, countries may take years to recover. Social cohesion and citizen security are therefore proving to be critical elements in the design of mitigation and adaptation measures. Community participation and maintaining livelihoods, income and overall quality of life are becoming just as important as other adaptation and mitigation measures in reducing vulnerabilities and building resilience to the negative impacts of climate change.

A new paradigm therefore has to emerge. Social cohesion, that is, the formal and informal connections between groups, is critical to the incremental and transformational change necessary for building resilience against the negative impacts of climate change. The new paradigm should therefore focus on creating social capital at the community level, developing capacities at the community and individual household levels, and building social resilience and cohesion by creating redundancies through community networks, social safety nets, and civil society organizations; these provide more than one system of coping so that when one system is impacted the others help with continued functioning. The greater the redundancy, the more resilient the system.

The proposed model of social resilience uses a "human preparedness" lens which focuses directly on people and community needs. Local organizations and networks can help their stakeholders to prepare for, adapt to, and mitigate the effects of climate change. Enhancing social resilience requires the cooperation and collaboration of all stakeholders: private sector, government (public sector), non-governmental organizations and other community organizations (such as faith-based ones). It also requires the promotion of community-based responses by increasing access to relevant information. ▲

# Environmental Champion Jack Johnson

*Being an environmentalist gives this music star a distinctive quality*

Photo: *Daniel DeSlover / Shutterstock*

Growing up on an island made singer-songwriter Jack Johnson into an environmentalist. Being born and bred on the north shore of Oahu in Hawaii instilled in him "a profound respect for nature [largely from] spending so much time in the ocean."

"It definitely played a big part in my becoming attracted to the environmental movement later in life," he told ***Our Planet***.

The son of a well-known surfer, he took to the waves himself from the age of five. At 17 he was the youngest invitee to get into the surfing finals of the Pipeline Masters tournament, but had to stop surfing professionally a week later after an accident knocked out several of his teeth and gave him 150 stitches in his forehead.

He carried on surfing recreationally however, and began a career making surfing films, visiting many Pacific islands. And more and more, he noticed how plastic debris, washed in from the sea, would pile up on the high-tide line on his island of Oahu and the shorelines he visited around the world. Sometimes the pollution on the surface was six inches thick, with microdebris extending a foot down into the sand.

"As I got older, I realized that there was more plastic every year," he says. "It became increasingly hard to step over the high-tide line without noticing. I felt it was my responsibility, as a surfer, to draw attention to it."

He was able to do much more after succeeding with another childhood interest, music. Having learned the guitar at the age of 14, Johnson started song writing at 17 and succeeded with his first album, Brushfire Fairytales, in 2001. He has since won many accolades, including a Brit Award.

Johnson rapidly started using his success to campaign for the environment. In 2003 he and his wife Kim (who he says has also played "a big part" in spurring him to action) started the Kōkua Hawai'i Foundation, which focuses on environmental education programmes in Hawaii's schools and communities. Five years later they created the Johnson Ohana Charitable Foundation, which operates worldwide. And in the same year, Johnson and his crew launched All At Once, a social action network linked to Johnson's tours that encourages people to take action locally. All At Once is


Photo: *UNEP*

*As I got older, I realized that there was more plastic every year. I felt it was my responsibility, as a surfer, to draw attention to it.*

Photo: *UNEP*

Photo: *UNEP*

currently collaborating with over 175 community groups across the globe on Johnson's 2013–2014 From-Here-To-Now-To-You world tour.

Both of Johnson's foundations concentrate on plastic-free initiatives and sustainable local food systems. Kōkua Hawai'i Foundation's main programmes are 'ĀINA In Schools, a farm-to-school initiative connecting kids to where their food comes from, and Plastic Free Hawaii, which encourages people to reduce their use of single-use plastics. In 2013 the Pacific Southwest Region of the US Environmental Protection Agency named the foundation as one of its eight environmental champions of the year.

Johnson's music tours themselves are made as green as possible. After "seeing all the empty plastic bottles" left over from concerts, Johnson and his crew set up water stations at most venues so that fans could bring their own reusable bottles to refill for free rather than buying single-use plastic bottles. They work with venues to reduce other waste as well, and ensure that all tour merchandise is made from sustainable materials.

Johnson uses sustainable biodiesel to fuel his tour trucks, buses and generators throughout North America and ships the team's gear by ground or sea freight, rather than by air "to further reduce the tour's carbon footprint." Any remaining emissions are offset through carefully chosen local programmes.

The offices of Johnson's own record label, Brushfire Records, are a renovated green building boasting a green roof, solar power and insulation made from recycled cotton from blue jean scraps. And his own home, the first LEED-certified platinum home in Hawaii, uses solar power and recycles water.

# CLIMATE CHANGE IMPLICATIONS FOR FISHERIES AND AQUACULTURE

For more information please visit cisl.cam.ac.uk/ipcc

## Climate Change Multiplies Existing Threats to the Ocean

Fisheries provide three billion people with around 20% of their average intake of animal protein, and 400 million depend critically on fish for food. Projected climate change impacts on fisheries and aquaculture are negative on a global scale; severely so in many regions.

### The Oceans' Chemistry is Changing at an Unprecedented Rate

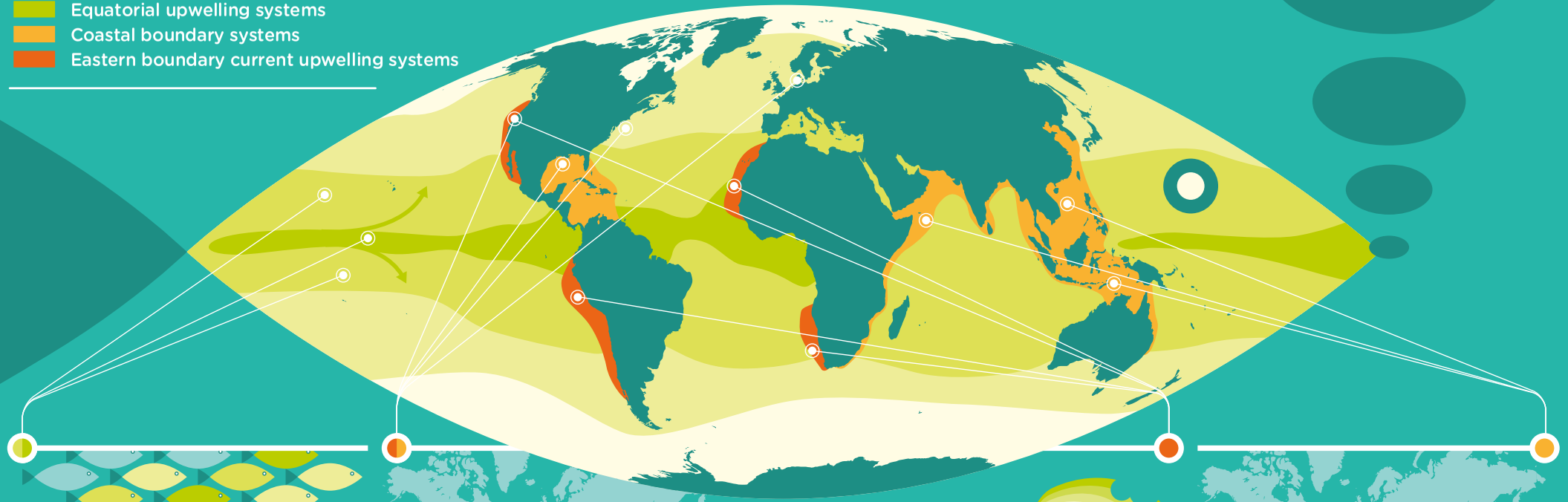
Ocean acidification—the results of enhanced carbon dioxide uptake from the air—puts commercially important fish and shellfish at risk. The oceans' pH has already fallen by 0.1 since pre-industrial times, roughly corresponding to a 30% increase in acidity. If $CO_2$ emissions continue to rise at the current rate, a further pH drop of 0.3 by 2100 is projected.

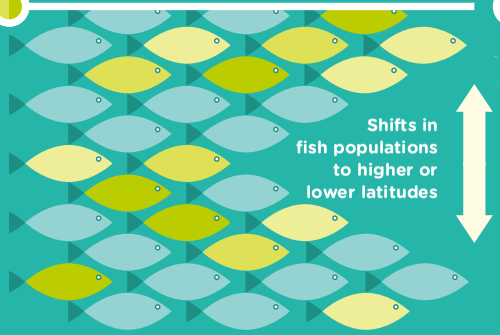
Change in ocean surface pH by 2100 under the "business-as-usual" scenario.

-0.6 (MORE ACIDIC) -0.05

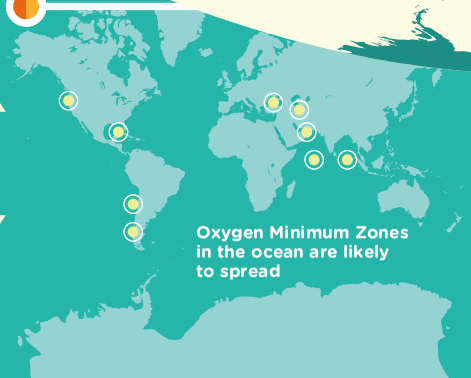
## FIVE AREAS TO WATCH

- High latitude spring bloom systems
- Subtropical gyres
- Equatorial upwelling systems
- Coastal boundary systems
- Eastern boundary current upwelling systems





Shifts in fish populations to higher or lower latitudes



Oxygen Minimum Zones in the ocean are likely to spread

Ocean acidification weakens shellfish

Reefs are dying faster than they are growing