

5- year Review of Progress made in Addressing Vulnerabilities of SIDS through Implementation of the Mauritius Strategy for Further Implementation (MSI) of the Barbados Programme of Action (BPOA)

UNEP REPORT

I. Introduction

1. By its decision 24/6, adopted at its twenty-fourth session in 2007, the Governing Council/Global Ministerial Environment Forum reiterated that small island developing States were particularly vulnerable to the effects of environmental degradation and that international cooperation towards strengthening their adaptive resilience to address such vulnerability was urgently needed. By that decision, the Governing Council requested the Executive Director to enhance further UNEP activities on small island developing States with a view to identifying further efforts, including any institutional arrangements, taking fully into account General Assembly resolution 61/196, to mainstream properly the Mauritius Strategy for the Further Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States into the work of UNEP.

2. By decision 24/6, the Governing Council recalled its previous decisions on small island developing States, particularly its decision 23/5 adopted at its twenty-third session immediately after the International Meeting for the 10-Year Review of the Barbados Programme of Action for the Sustainable Development of Small Island Developing States. In that decision, the Governing Council requested the Executive Director to continue strengthening activities related to small island developing States on a tailored and regional basis and further to rationalize delivery by UNEP in the Pacific, the Atlantic, the Indian Ocean, the South China Seas and the Caribbean region, using the network of UNEP regional offices, regional seas programmes, conventions and action plans, and partners to the greatest extent possible. In the same decision, the Governing Council also requested the Executive Director to ensure that the activities that UNEP undertakes in relation to small island developing States contribute to the implementation of the Mauritius Strategy.

3. The present document reports on the activities undertaken by UNEP to comply with its mandate as provided by the United Nations General Assembly and relevant intergovernmental decisions on sustainable development, as well as the mandate derived from the UNEP Governing Council decisions on small island developing States.

4. Important to be mentioned here is that UNEP has developed a policy paper on Thematic Priority Areas for UNEP's support to the Sustainable Development of SIDS, aligned to the Bali Strategic Plan for Technology Support and Capacity-building, that mainstreams the Mauritius Strategy into its programme of work and sets out priority outcomes to be achieved. The issues in this paper, through the component on vulnerable people and vulnerable places -including SIDS- of the UNEP Marine and Coastal Strategy, will constitute an institution-wide planned, strategic approach to the work of UNEP on SIDS. It is expected that the UNEP Marine and Coastal Strategy, recently developed by the Coastal and Marine Branch of the Division of Environmental Policy Implementation, will assist in directing programmes for SIDS within UNEP in a more strategic and coordinated manner. In addition, the overall coordination of UNEP activities for small island developing States has been assigned to a staff member in the Coastal and Marine Branch.

5. As a knowledge-based organization, UNEP is called upon to continue supporting the implementation of the Mauritius Strategy by providing credible thematic leadership through the six cross-cutting thematic priorities of its Medium-term Strategy 2010-2013, i.e., climate change, disasters and conflicts, ecosystem management, environmental governance, harmful substances and hazardous waste, resource efficiency – sustainable consumption and production.

II. UNEP support to SIDS in the implementation of the Mauritius Strategy according to the thematic areas therein outlined

6. The present section provides information on UNEP activities, projects and programmes grouped in accordance with the thematic areas outlined in the Mauritius Strategy, from climate change and sea-level rise to knowledge management and information for decision-making. In pursuit of the UNEP Bali Strategic Plan on Capacity-building and Technology Support, and the relevant UNEP Governing Council decisions on South-South cooperation, information on South-South cooperation has been added at the end of the section.

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A. Climate change and sea-level rise

7. UNEP has undertaken climate change and sea-level rise activities with many currently underway as follows:

(a) Implementation is under way of the global GEF-funded project on coastal resilience to climate change: developing a generalizable method for assessing vulnerability and adaptation of mangroves and associated ecosystems. The purpose of the project is to develop a generalizable method and process to develop an effective adaptation strategy that could be adapted to various sites within common ecosystems. Specifically, all three project countries, including Fiji, have already held at least one stakeholder workshop on developing climate vulnerability assessments and building adaptation capacity. Initial stages of the generalizable methodology are being discussed, and a clearer and quantitative process for assessing the impacts of climate change to mangrove ecosystems in each of the three project countries has been outlined. The generalizable methodology to be produced will be the first of its kind for mangrove ecosystems. Discussions progress with partners in terms of testing this approach and sharing lessons learned at other sites, i.e., Belize, Madagascar, etc.

(b) In Latin America and the Caribbean (LAC), GEO is supporting governments and institutions to produce data and information on the state of the environment that can be incorporated into local, national, regional and global assessments. GEO assessment methodology has been applied at several levels: regional (GEO-LAC), sub-regional, local, thematic (GEO-Youth, GEO-Health, Climate Change in the Caribbean) and at the ecosystem level (GEO-Amazonia, GEO-Titicaca, and GEO-Brazil Forests). The GEO process has also contributed to the creation and strengthening of a regional network of scientific centres and experts.

In many cases, GEO represents the first time scientific and policy experts have come together to draw conclusions on the state of the environment. This has triggered interdisciplinary dialogue –vital in any effort to mainstream environmental issues – and provides the basis for informed decision making.

“Climate Change in the Caribbean and the Challenge of Adaptation” was completed in early 2009 and produced jointly with the Caribbean Community and Common Market (CARICOM). It has contribute to the dialogue between policy-makers and the scientific community, in order to prepare a more vigorous climate change programme, maximize opportunities and confront the threats and risks posed by possible climate changes. The study also highlights climate change trends, in particular their impact on SIDS.

(c) Capacity building is also being provided, in collaboration with the Secretariat of the Regional Environment Programme (SPREP), in Integrated Environmental Assessment (IEA) for the South Pacific to produce a South Pacific Environment Outlook (South Pacific GEO). This assessment will focus on climate change impacts and adaptation, and will complement and aim to support national and regional actions set out in the SPREP Programme of Work 2009, and the Action Plan for the Implementation of the Pacific Islands Framework for Action on Climate Change 2006-2015. To be implemented together with the IEA activity is the training activity to build capacities among governmental and scientific institutions in mapping vulnerability to climate change and ecosystem change, and risk reduction at national and regional levels, as a basis for adaptation planning, financing and cost effective preventive actions. Beneficiary countries will be SIDS in the South Pacific and Indian Ocean.

In the Asia-Pacific region, GEO activities also include an assessment of freshwater vulnerability to climate change for selected countries of the Pacific, to be conducted jointly with SOPAC; and the Environment and Climate Change Outlook report for Papua New Guinea.

(d) Support for the development of regional strategies on chlorofluorocarbons (CFCs) is being provided with the primary aim of phasing out CFCs as required under the obligations of the Montreal Protocol on Substances that Deplete the Ozone Layer. Beneficiary SIDS include in the Pacific: Cook Is, Niue, Nauru, Marshall Is, Palau, Solomon Is, Kiribati, Tonga, Vanuatu; in the Caribbean: Antigua and Barbuda, Barbados, Belize, Dominica, Dominican Republic, Grenada, Guyana, Haiti, Jamaica, Saint Lucia, Saint Kitts and Nevis, Saint Vincent and the Grenadines, Suriname, Bahamas; in the Atlantic and Indian Oceans: Cape Verde, Comoros, Madagascar, Mauritius, Sao Tomé and Príncipe, Seychelles.

(e) Under the project “Climate Change Adaptation and Mitigation in the Tourism Sector: Frameworks, practices and tools for coastal destinations and SIDS”, UNEP has also strengthened the capacity of SIDS by improving the climate change awareness of governmental officials responsible for tourism development in SIDS, and the adaptation planning for SIDS since tourism is the main driver of economic development in most of these islands. A first global capacity building seminar for governmental officials from tourism and environment ministries was held in 2008 in Oxford and regional seminars are planned to take place in 2009, aiming to build the capacity of the tourism sector, particularly in

SIDS, to address the threats, challenges and opportunities of climate change and implement the Davos Declaration and recommendations on Tourism and Climate Change.

(f) On the Road to Copenhagen, the Conference of the Parties of the UN Framework Convention on Climate Change (UNFCCC) and the meeting of the Parties to the Kyoto Protocol, in Bali, Indonesia, in December 2007, resulted in a series of decisions that would shape the future global climate change regime and which are of particular relevance to developing countries. Those decisions, commonly referred to as the Bali Roadmap, established a process and set out guidance and direction for a negotiation track to address climate change issues after the first commitment period of the Kyoto Protocol expires in 2012.

Negotiations under the Bali Roadmap for the post-2012 period are tough and complex. It is essential to consider that developing country Parties should play an active role and have their national and regional positions clearly articulated, defined and defended throughout UNFCCC discussions. To ensure that negotiators from developing countries are fully abreast of the latest developments in advancing the Bali Roadmap and are properly prepared to participate in discussions on progress achieved in Bali and at the subsequent climate change conference, which took place in Poznan, Poland, in December 2008, UNEP and the UNFCCC Secretariat organised a series of regional preparatory workshops throughout 2008 and 2009 for negotiators from Least Developed Countries, Asia, the Alliance of Small Island States, Africa, and Latin America. The goal was to assist the Parties in articulating and/or refining national and, wherever possible, regional policy positions with regard to specific building blocks of the Bali Roadmap and other items on the climate change agenda. The workshops were attended by participants from 120 countries.

A Pacific regional climate change consultation and negotiations training for UNFCCC COP15 was held by UNEP in May 2009 in Samoa with the objective to provide an introduction to negotiations training skills for the participants so that they could actively engage in future climate change negotiations. Participating Pacific SIDS were Cook Islands, Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu.

(g) UNFCCC Parties have recognised the importance of promoting adaptive action. The Subsidiary Body for Scientific and Technological Advice recognised that regional centres and networks undertaking work relevant to climate change play an important role in enhancing adaptation and agreed to promote existing networks for impacts, vulnerability and adaptation and encouraged the establishment of new networks. To this end, UNEP, in partnership with key UN and other international organisations has proposed a Global Climate Change Adaptation Network. To initiate the process, UNEP convened an International Consultation Meeting in October 2008, hosted by the Government of the Republic of Korea. Participants, including government representatives, experts from Africa, Asia, Latin America and the Small Island Developing States, and UN and other partner organisations endorsed the need for the global adaptation network and agreed on its main functions and associated structure.

The Network aims at helping developing countries enhance their key adaptive capacity through supporting governments, communities and other users with knowledge, technology, and capacity building for adaptation policy setting, planning and practices. The three components of the Network are: ground facilities, regional centres and an international support group of technical institutions, supported and complemented by a knowledge management system and regional policy forums. The Network will build on existing networks, institutions, centres and ground facilities. UNEP is facilitating the next steps in establishing the Network by building regional and global consensus and pilot testing the initiative in Africa and the Asia-Pacific region.

(h) Future climate change and sea-level rise activities include a project on preparing for the threat of sea level rise – climate proofing coastal zone management, which aims to prepare islands for the threat of sea-level rise through the development of climate-proofing options in the form of policy guidance, tools, technologies, best practices and enhanced institutional capacity that can be integrated in the development and management processes of vulnerable coastal zones, particularly in SIDS. Another project under development is the one entitled “Developing an analytical basis for improved policies responding to human migration as a result of climate change impacts”, which has two components, i.e., adaptation and migration case studies -to be implemented in eco-regions vulnerable to climate change, including SIDS- and global overview of national and transboundary vulnerability to climate change in the context of human migration.

(i) The Many Strong Voices Programme, managed by UNEP-GRID/Arendal, brings together local, national and regional stakeholders in the Arctic and Small Island Developing States to support and build capacity among vulnerable regions and peoples. It helps to collaboratively devise strategic solutions to the challenges of climate change, and to highlight the perspectives of peoples in the two regions.

(j) UNEP Marine Branch in the Division of Environmental Policy Implementation, in cooperation with the Indian Ocean Commission is implementing a project with the objective of raising awareness of the fisheries and farming community, agricultural technicians and decision makers in the IOC member states on the impact of climate change on marine and coastal ecosystems, agricultural food production and human health. The main activity consists of a regional workshop –to take place in late 2009- to raise awareness on the impacts of climate change and the adoption of recommendations for a regional strategy /action plan to enhance food production and measures to address the impacts of climate change.

(k) The UN-REDD Programme, which builds on the convening power and expertise of the Food and Agriculture Organization of the United Nations (FAO), the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP), was created to assist developing countries get ready to participate in a future REDD mechanism. Through its nine initial country programme activities in Africa, Asia and Latin America, the UN-REDD Programme supports the capacity of national governments to prepare and implement national REDD strategies with the active involvement of all stakeholders, including indigenous peoples and other forest-dependent communities.

REDD - Reducing Emissions from Deforestation and Forest Degradation in Developing Countries - is an effort to create a financial value for the carbon stored in forests, offering incentives for developing countries to reduce emissions from forested lands and invest in low-carbon paths to sustainable development.

Papua New Guinea is one of the pilot countries of UN-REDD Programme. This project aims at initiating the quick start phase of readiness support for REDD. Its objectives are to assist Papua New Guinea to prepare a draft National REDD Plan for consideration of the Cabinet by 31 October 2009, in line with the National Executive Council decision of 11 February 2009, and to develop a full national programme that shall be resubmitted to the UN-REDD Policy Board. The initial Papua New Guinea UN-REDD Programme has 5 components:

- Outcome 1 : Readiness management arrangements are in place
- Outcome 2: Arrangements for establishing a reference emission level are in place
- Outcome 3: Framework for Forest Carbon monitoring and Reporting are developed
- Outcome 4: REDD costs and fiscal transfers
- Outcome 5: Stakeholders engaged in PNG's REDD readiness process.

An early leader on the topic of REDD, Papua New Guinea is advancing towards readiness. The Office of Climate Change and Environmental Sustainability, under the Prime Minister's office, leads on the issues.

(l) UNEP's climate change-related outreach activities, which cover SIDS, include:

- running a climate change website with associated web based resources (new media and viral communications) that showcases all of UNEP's climate change activities, as well as UNEP's climate change campaigns, outreach materials and special events;
- developing climate change outreach materials including publications (electronic and hard copy) and audio-visual products, that raise awareness about climate change issues, focusing on issues that highlight UNEP's substantive climate work (e.g. ecosystem-based adaptation, REDD, clean energy, SIDS, etc.), as well as developing specific materials promoting UNEP's climate change work and achievements;
- conducting specific climate change awareness-raising and outreach campaigns and special events like the Billion Tree Campaign, UNite to Combat Climate Change, Seal the Deal! and World Environment Day, as well as campaigns focusing on UNEP's climate change work (along the lines of the UN Works Campaign);
- organising awards programmes (e.g. Champions of the Earth, Sasakawa and others) with specific categories dedicated to climate change (e.g. Climate Change Champions of the Earth);
- organising press and outreach events (including press releases, media briefings, audiovisual aids, etc.) to launch and promote UNEP publications and events related to climate change;
- promoting carbon neutrality and greening of sports and cultural events (e.g., Olympic Games, FIFA World Cup other sports events, music festivals, world exposition and others) through environmental audits, reviews, advisory services to sport organizations and setting up of an international working group on climate neutral events, particularly sport events;
- developing and implementing educational programmes, including educational assessment reports, research grants and fellowships to fund innovative research on climate change, supporting of student campaigns on climate change, facilitating innovative research on climate change through access to the Online Access to Research in the Environment (OARE), etc.

B. Natural and environmental disasters

8. UNEP has undertaken a number of activities related to natural and environmental disasters, including:

(a) The development of economic incentives for the rural sector to undertake disaster preparedness activities in the Caribbean, jointly with partners such as the Caribbean Disaster Emergency Response Agency (CEDERA), the Food and Agriculture Organisation of the UN (FAO) and the Partnership on Sustainable Land Management (PISLM);

(b) Technical assistance to Jamaica to facilitate coastal rehabilitation, development of Palisades Peninsula post Hurricane Ivan, and disaster preparedness. Feasibility Studies have been completed and coastal rehabilitation work is in progress.

(c) Capacity-building for marine pollution prevention and oil spill response. Five pollution prevention seminars on the ratification and implementation of annex V to the International Convention for the Prevention of Pollution from Ships and a workshop on the development of a regional cooperation mechanism for response to oil spills were conducted in Saint Lucia, Barbados, Dominica, Saint Kitts and Nevis and Antigua and Barbuda. Partners were the International Maritime Organization (IMO) and the Regional Marine Pollution Emergency Information and the Training Centre for the Wider Caribbean. As main impacts of this activity it is worth mentioning facilitated discussions between various groups on current pollution challenges in the region and the threat of emerging issues such as the impact of invasive species to the Wider Caribbean Region; information disseminated to countries of the Wider Caribbean Region to enable them to take action to bring the MARPOL Annex V "Special Area" designation into force; and increased awareness amongst public on the importance of marine environmental protection and the LBS Protocol

(d) The development of guiding principles for post-tsunami rehabilitation and reconstruction. The 12 principles for sustainable coastal rehabilitation, developed in 2005, have been disseminated through the Global Programme of Action, with support for implementation to the tsunami-affected countries and others.

(e) The development of the "Handbook on Disaster Risk Management for Coastal Tourism Destinations - Responding to Climate Change - A Practical Guide for Decision Makers", which aims at supporting coastal tourism destinations to prepare and respond to climate change related natural disasters. The handbook is being developed in partnership with the Caribbean Alliance for Sustainable Tourism (CAST) and is already proving useful to improve the capacity of coastal tourism destinations in SIDS to deal with disaster risk management.

(f) The Haiti Restoration Initiative is a proposed highly ambitious 20 year programme that will be catalysed by UNEP but implemented by Haitians, assisted by a coalition of UN agencies and international partners. The project is designed to be catalytic in nature, with UNEP and other international partners, influencing the national government and international partners to a) integrate ecosystem management and restoration programmes into national legislation, policies and investment programmes and b) develop and implement a range of practical action restoration programmes. The UNEP role will be a carefully balanced combination of activities; covering awareness raising, capacity building, technical assistance, coordination and demonstration project implementation.

Haiti is the poorest country in the Caribbean and the least stable. It is also the most environmentally degraded. This degradation has associated severe social and economic impacts - the largely destroyed rural environment currently cannot fully feed its population or provide adequate livelihoods. The degraded catchments also leave both its rural and urban populations highly vulnerable to flooding. The central concept of the initiative is that just the degradation of the environment and associated ecosystem services of Haiti, has strongly contributed to the poverty and disaster vulnerability of the population, large scale and sustained restoration of these ecosystems can contribute to poverty reduction and disaster risk reduction.

The proposed outcome of the 20 year initiative is: *Poverty and disaster vulnerability in Haiti are reduced through the restoration of ecosystems and livelihoods based on sustainable natural resource management.* The proposed outcome of the 2010-2011 project is: *Investments (by government and international community) per annum in integrated ecosystem restoration, poverty reduction and disaster risk reduction programme are increased 100% over the baseline of 2009.*

C. Management of waste

9. UNEP has undertaken the following activities on the management of waste and chemicals:

(a) As regards wastewater, UNEP and its partners have developed and implemented a global training programme to improve wastewater management in coastal cities, with a focus on SIDS. It is a UN inter-agency partnership, implemented jointly with the UNESCO-IHE Institute for Water Education and accredited by UN/DOALOS as a TRAIN-SEA-COAST course. The experts trained came from the following countries: Anguilla, Antigua and Barbuda, Bahamas, Barbados, Comoros, Cook Islands, Dominica, Federated States of Micronesia, Fiji, Grenada, Guam, Kiribati, Maldives, Marshall Islands, Mauritius, Palau, Samoa, Saint Kitts and Nevis, Saint Lucia, Seychelles, Solomon Islands, Tonga, Trinidad and Tobago, and Tuvalu. The programme started in 2003, but the first delivery in a SIDS was in 2005 (Fiji). 385 experts from SIDS have been trained in 18 courses, i.e., 9 courses in the Caribbean, 6 in the Pacific and 3 in East Africa. The course participants are mid-career municipal wastewater managers and decision-makers, who have some responsibilities in the design of new projects to collect and treat wastewater (in an environmentally friendly and

financially sustainable way). A few representatives from stakeholder groups such as fisheries, tourism, public health, communities or environmental NGOs will contribute to the learning experience. The training provides participants with analytical tools, substantive information and skills on how to select, plan and finance appropriate and environmentally sound municipal wastewater management systems. The course focuses on four elements:

- Objective Oriented Planning (the project identification part of the project cycle)
- Innovative Technological and Financial Approaches
- Stakeholder Involvement (benefits of stakeholder involvement and how to do it)
- Presentation Techniques and feasibility reporting

(b) Sewage Treatment in Jamaica. The pilot project in Jamaica on the assessment of over 170 Sewage Treatment Plants (STPs) island wide is ongoing. All plants have been mapped for the project's GIS database and a GIS platform has been developed to store and present this database in a geospatial context. . The next steps will be to incorporate initial data from the STPs while combining the GIS databases of the various project partners: the Jamaican Ministry of Health and Environment, the National Environment and Planning Agency, and the National Water Resource Authority

(c) Development of national implementation plans for the management of persistent organic pollutants (POPs), designed to strengthen national capacity to manage such pollutants and assist countries to meet their obligations under the Stockholm Convention on POPs, and to produce guidelines for the development of National Implementation Plans (NIPs) and adoption of POPs management options, which will be developed based on the experience gained and lessons learned. NIPs have been completed for Cape Verde, Micronesia and Papua New Guinea. These include action plans that country teams, built during the project, can implement as resources become available.

The project has generated NIP guidance, adopted at COP1, of universal application to national planning for POPs. Guidance on socio-economic assessment of POPs plans was developed in 2006. Supplementary guidance on action planning was developed in 2007. Lessons learned and good practices in national POPs planning were identified through regional workshops in 2005 and disseminated following a launch event at Stockholm Convention COP2

(d) Development of enabling activities for the Stockholm Convention and national implementation plans (NIPs), which aims at the development of sustainable capacity to fulfil national obligations under the Stockholm Convention, preparation of NIPs, prepare countries for implementation of the Convention and to strengthen national capacity to manage POPs and chemicals. Beneficiary countries are Haiti, Bahamas, Cuba, Kiribati, Tonga, Palau, Vanuatu, Nauru and Tuvalu.

(e) Project on supporting the persistent organic pollutant global monitoring plan, which will enable small island developing States in the Pacific and East Africa to contribute national persistent organic pollutant analyses for reporting under the Global Monitoring Plan. Beneficiary SIDS are Fiji, Kiribati, Niue, Palau, Samoa, Solomon Islands, Mauritius.

(f) Regional programme of action and demonstration of sustainable alternatives to DDT for malaria vector control in Mexico and Central America (including Belize), designed to prevent the reintroduction of DDT for vector control by promoting new integrated control techniques and implementing a coordinated regional programme to improve national capacities using demonstration projects on vector control without DDT or other persistent pesticides that are replicable, cost-effective, environmentally sound, and sustainable. The first and second component of the project have significantly contributed to strengthening capacities for the NIPs implementation and partnering in the demonstration of Feasible, Innovative Technologies and best practices for POPs reduction through the demonstration of feasible alternatives to DDT. The third component is contributing to partnering in investments for NIP implementation through the destruction of POPs wastes.

(g) Promotion of integrated management of solid and hazardous wastes and an integrated life-cycle approach to the management of chemicals in the wider Caribbean region, with a view to supporting continued cooperation between the secretariats of the Cartagena Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region and the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal in the areas of used oil and used lead acid batteries in the Wider Caribbean Region through the Basel Convention Regional Centres and with the LBS RACs . The project also aims at supporting the implementation of the Cartagena Convention and its Protocols, the Action Plan, the Basel Convention, and the MARPOL 73/78 Convention. Under the project a Regional Used Lead Acid Battery Strategy and a Draft Regional Used Oil Management Strategy have been approved.

(h) Projects related to ozone layer protection, which also have training components on best practices in recovery and recycling of ozone-depleting substances are under way in all regions in cooperation with other implementing and bilateral agencies for the Montreal Protocol. The activities address the required action set out in the Mauritius Strategy of promoting reduction, reuse and recycling of waste and waste management initiatives:

- The Montreal Protocol Compliance Assistance Programme provides assistance to compliance management, developing and implementation of policies and legislation, refrigerant and methyl bromide management, public

- awareness and education etc. (Belize, Suriname, Guyana, St. Vincent and the Grenadines., Grenada, Barbados, St. Lucia, Antigua/Barbuda, Dominica, Dominica Republic, Haiti, St. Kitts Nevis, Barbados, Cuba).
- The Montreal Protocol Institutional Strengthening (ISP) supports national capacity building and through National Ozone Units for the compliance and management of the Montreal Protocol (Belize, Suriname, Guyana, St. Vincent and the Grenadines., Grenada, Barbados, St. Lucia, Antigua/Barbuda, Dominica, Dominica Republic, Haiti, St. Kitts Nevis, Barbados).
 - The Montreal Protocol Terminal Phase out Management Plan for CFC provides capacity-building, institutional support, investment, in both the public and the private sectors and appropriate technology transfer are used as the tools towards sustainable compliance and transition to alternative ozone friendly technologies (Belize, Suriname, Guyana, St. Vincent and the Grenadines., Grenada, Barbados, , Dominica, Dominica Republic, Haiti, St. Kitts Nevis, Barbados).
 - The Montreal Protocol National Country Programmes for Hydrochlorofluorocarbons (HCFC) phase out management supports Country programmes for the management of phase out of HCFC and in keeping with the decisions of the parties to the Montreal Protocol that the alternative technologies are also climate friendly and energy efficient (Belize, Suriname, Guyana, St. Vincent and the Grenadines., Grenada, Barbados, St. Lucia, Antigua/Barbuda, Dominica,, St. Kitts Nevis, Barbados).
 - The Montreal Protocol Regional Workshops and networking are Network meetings for the Caribbean SIDS. National Ozone Offices and other key national, regional and international stakeholders are invited. They develop and implement strategies to address emerging issues such as ozone friendly technologies, new skill requirements, illegal trade in ODS alternative technologies to methyl bromide use and trade in used technologies that are ODS dependent thereby- contributing to dependence on ODSs (Belize, Suriname, Guyana, St. Vincent and the Grenadines., Grenada, Barbados, St. Lucia, Antigua/Barbuda, Dominica, Dominica Republic, Haiti, St. Kitts Nevis, Barbados, Cuba). These workshops have promoted the use of the e-forum to provide updates on the developments of the Montreal Protocol and other communications from the Ozone Action Clearing house, intelligence information on potential illegal trade of ODS.
 - The Montreal Protocol, Compliance Enforcement for the Prevention and Control in the illegal trade on Ozone depleting substances is intended for regional cooperation to control the transboundary movement of ODS, the efficient enforcement of import and export controls, the enhanced compliance with Montreal Protocol phase-out requirements, and the support to the change to better practices in the servicing sector by preventing illegal supply of CFCs.
 - The Ozone-related South- South cooperation programme has as its objective to support and encourage the use of available human resources within the Caribbean SIDS. Under this programme Cuba assisted Haiti in the reorganization of the national ozone office, training of new ozone officer and other key national stakeholders, assistance in the collection and preparation of ODS data reporting and guide of the establishment of a licensing system.
 - The training programmes to manage ozone-depleting substances provides capacity-building to implement best practices in recovery and recycling of ozone-depleting substances. Beneficiary countries are Cook Islands, Niue, Nauru, Marshall Is, Palau, Solomon Is, Kiribati, Tonga and Vanuatu, Barbados, Belize, Haiti, Suriname, Antigua and Barbuda, Dominica, Dominican Republic, Grenada, Guyana, Jamaica, Saint Lucia, Saint Kitts and Nevis, Saint Vincent and the Grenadines and Bahamas.
 - The project on halon management addresses a range of issues surrounding the use and management of halon substances, such as technical assistance, awareness-raising and demonstration activities, and the establishment of an internet-based Caribbean regional halon clearing house at the regional level.
 - The project on methyl bromide phase-out, being implemented in Saint Kitts and Nevis aims at providing technical assistance and capacity building to phase-out the remaining methyl bromide non-quarantine and pre-shipment uses, including a training programme in methyl bromide alternatives and the purchase of the necessary machinery for the implementation of the new technology.
 - The project on strengthening cooperation with the refrigerant sector and customs officials for managing ozone-depleting substances in Africa is intended to ensure that the regulations are enforced; phase-out activities are implemented; public awareness is raised; and follow-up is given to the review of ozone depleting substances legislation; and data reporting. It is being implemented in Cape Verde, Comoros, Seychelles, Madagascar, and Sao Tome and Principe.

Success Story:

UNEP OzonAction's contribution to Mauritius Strategy for SIDS (MIS)

The Montreal Protocol that has completed 22 years is proving to be a successful model for the future Multilateral Environmental Agreements (MEAs). As the first international environmental agreement based on precautionary principles, it has entered into history as a pioneering example of international cooperation to address global environmental issues.

The remarkable success of the phase out of ozone depleting substances (ODS) in developing countries thus far can be attributed to the far-reaching policies and measures pursued by the Multilateral Fund of the Montreal Protocol that over last 18 years has provided targeted financial and technical assistance to the developing countries. The Multilateral Fund has recognised that for the implementation of an MEA, technology transfer and investment projects need to be complemented by legislative, regulatory interventions to enhance the sustainability of the change under the MEA. This recognition has been the basis for providing the capacity building assistance for strengthening the National Ozone Units (NOUs) and other relevant governance structures in countries that operate under Article 5 of the Protocol (i.e. developing countries). UNEP has been the implementing agency under the Multilateral Fund to assist developing countries with such capacity building initiatives, typically called as non-investment activities including but not limited to information, education and communication activities (IEC). UNEP through its OzonAction Programme is assisting 145 developing countries, including 43 SIDS, with such capacity building initiatives. Symbolically, Timor Leste, the world's youngest democracy, was the last country to ratify the Montreal Protocol on 16 September 2009, thus making it the first universal environmental treaty.

The original Montreal Protocol signed in 1987 did not make any provision for the special assistance to address the needs of the regional blocks like SIDS and Least Developed Countries (LDCs) within the developing countries. However, the dynamic and evolving character of the Montreal Protocol has succeeded in addressing the needs of these important groups of the countries through innovative mechanisms. Many of the SIDS now are in the forefront of the implementation of the Protocol. Fiji has become first country among all of the developing countries to report zero consumption of Ozone Depleting Substances (ODS) over last two successive years. The countries like Mauritius and the Bahamas have used the Multilateral Fund's assistance in creative ways to develop the total phase out management approaches for their countries to remain ahead of the timetable of the Montreal Protocol.

UNEP's Capacity Building Initiatives in SIDS

Since 1991, the UNEP DTIE OzonAction Programme has strengthened the capacity of governments (particularly National Ozone Units or "NOUs") and other stakeholders (such as the private sector, NGOs, academic and training institutions, customs agencies, refrigeration institutes, SMEs, the informal sector, etc.) in developing countries, including SIDS. By delivering a range of capacity building services to developing countries tailored to their individual needs, the Programme has helped promote cost-effective ODS phase out activities at the national and regional levels. The main services provided by the Programme are an information clearinghouse, developing and implementing refrigerant management plans (RMPs), regional networking, training, formulating and implementing Country Programmes (CPs) and Institutional Strengthening (IS) projects, and preparing and implementing national and regional phase out plans.

In supporting the SIDS, UNEP has been mindful of the fact that economic, social and environmental vulnerability is pervasive in these countries due to their small size, geographic dispersion, limited natural and human resources, and their narrow economic bases.

Remaining challenges for SIDS

The Montreal Protocol requires developing countries to control the consumption (production + import - export) of CFCs. Therefore the focus of activities in the SIDS is to ensure the sustainable phase out of CFCs and that there is no "back-sliding" once phase-out has been achieved.

There are no manufacturing facilities and no new installations of refrigeration equipment using CFCs in any of the countries. CFC-12 and to a much smaller extent, CFC-502 are now used exclusively in servicing existing mobile air-conditioners (MACs), (cars, trucks and buses), domestic refrigerators and small commercial refrigeration equipment. In most countries, the servicing of MACs is the largest ongoing use of CFCs.

In those remaining markets where CFCs are still available, prices are reported to be rising sharply. This is because traditional sources of supply, such as Australia, Japan, New Zealand and the US, have stopped production or consumption.

The most significant threat to the sustainable phase out of CFCs in the SIDS is the importation of second hand vehicles and other CFC using equipment from developed countries. Because most of the imported vehicles were built before 1995 (the year most car companies converted the air-conditioner units from CFC-12 to the non-ozone depleting HFC-134a) they are still fitted with CFC air-conditioning units when they arrive in the countries. In most countries there is a

rising (and often unmet) demand to service these units. This demand creates an ongoing risk of illegal imports which is likely to reverse the present trends.

Some SIDS also face additional risks from illegal imports because of their proximity to large developing countries. For example, PNG shares a land border with Indonesia and Palau is only 800km (500 miles) from the Philippines. Additional efforts may be necessary to ensure their ongoing compliance.

Because of the tropical climate and small land masses of the SIDS, corrosion of steel products including pipe work in refrigeration and air-conditioning equipment is a major problem. Most steel appliances have very short working lives, or require almost continuous maintenance to keep them in working order. Hence the servicing and maintenance training to reduce the use of CFCs assumes a significant importance.

The ultimate success of the Montreal Protocol will depend on the continuous commitment and efforts of all Parties to achieve the phase-out of ozone-depleting substances (ODS). Innovative responses are required to address new challenges such as the increasing illegal trade in ODS, the flow of second-hand ODS-based refrigerators and vehicles into the SIDS, and the complex interrelationships with other environmental agreements such as the UN Framework Convention on Climate Change (Kyoto Protocol).

The key remaining challenge regarding the Montreal protocol is now to implement gradual reductions of consumption of hydrochlorofluorocarbons (HCFCs). The new schedule for developing countries, including SIDS, was approved in 2007 by the Parties to the Montreal Protocol. It requires the adoption of HCFC phaseout management plans (HPMPs), which will eventually lead to the phaseout of HCFCs by 2030. Based on the importance of climate issues for SIDS, it is essential that this phaseout leads to the adoption of the most climate-friendly alternatives to HCFCs. It is also crucial that remaining ODS banks are properly disposed of, with possibilities of ODS destruction. This climate dimension was underlined by two SIDS, Mauritius and the Federated States of Micronesia, which made a proposal of amendment to the Montreal Protocol in May 2009: it included text to phasedown HFCs under the Montreal Protocol (HFCs are currently only controlled by the Kyoto Protocol); and to control remaining ODS banks. The proposal will be debated at the next Meeting of the Parties to the Montreal Protocol in Port Ghalib (Egypt) on 4-8 November 2009.

(i) The Multi-country project “Solid waste management in the Pacific” is being developed to improve waste management in the Pacific islands with the objective of supporting the application of what is known as the “3R” principle: reduce, reuse and recycle- concepts that call for very high efficiency in resource flows as a way of sustaining improvement in quality of life within natural and economic constraints, aiming at maximising resource efficiency as well as to minimise waste discharge and environmental pollution, including that affecting the coastal and marine environment. The focus of the project is on market-driven mechanisms and the involvement of the private sector. Beneficiary countries are Fiji, Vanuatu, Solomon Islands, Papua New Guinea, Samoa, Tonga, Tuvalu, Kiribati, Federated States of Micronesia, Marshall Islands, Palau and Cook Islands.

(j) An e-waste initiative, under which UNEP is assessing a programme for the environmentally sound management of electrical and electronic waste in the Pacific islands (Samoa, Kiribati, Cook Islands, Papua New Guinea and Solomon Islands) focused on minimizing waste generation. Specific objectives of the project are: a) To ensure that e-waste generation in the region is minimized and what is generated is managed in an environmentally sound manner consistent with the Basel and Waigani Conventions, with consequent benefits both to the environment and economies of participating countries; b) To conduct feasibility studies and training courses at regional level; c) To implement the Initiative for Solid Waste Management in the Pacific Region (2005 – 2012). E waste training workshop was held in Vietnam for Asia and Pacific participants under the Basel Convention Partnership on Environmentally Sound Management (ESM) of E-waste in the Asia-Pacific region.

(k) The project for legislative development through regulations for Used Oils, Water and Air Pollution in Grenada was completed creating new legislation to address key issues in place and building capacities for the drafting of environmental law.

(l) A Quick Start Programme trust fund established to support activities to enable initial capacity-building and implementation of the Strategic Approach to International Chemicals Management continues to give priority to the urgent needs of least developed countries and SIDS. (See para 68 below).

(m) The project “Supporting the POPs Global Monitoring Plan and building capacity at POPs laboratories at national level” aims to build national capacity to contribute with national POPs analyses for providing own results to the Global Monitoring Plan of POP for reporting under the effectiveness evaluation for the Stockholm Convention on Persistent Organic Pollutants (POPs). The project is under implementation in various regions, i.e., Pacific: Fiji, Kiribati, Niue, Palau, Samoa, Solomon Islands, Tuvalu; Caribbean: Antigua and Barbuda, Jamaica, Barbados, Bahamas, Haiti, Cuba; Indian ocean: Mauritius. Concrete actions taken so far include assessment of existing capacities; identification of needs for training (human resources) and small materials (spares, consumables, standards); development of standard operational procedures/protocols for sampling and analysis, on-site training at developing country laboratories, intercomparison study of laboratories at the global level.



Fiji POPs Laboratory



Fiji POPs training



Cuba workshop

10. Constrains and lessons learnt regarding chemicals

SIDS lack the capacity to analyze environmental and human samples in their own laboratories (for technical and economic reasons); therefore, it is important to link them with experienced laboratories to analyze their samples and link them into existing networks to exchange information and results and jointly come to interpretation of their data to initiate adequate action or follow-up activities,

- Fiji for example, which hosts a regional university (University of South Pacific) and with its Institute of Applied Science, participated as one of nine laboratories in the UNEP/GEF project on "Assessment of existing capacity and capacity building needs to analyze POPs" (2005-2008), the laboratory has well developed since the initial visit and the training: the scientists participate at international conferences, they collaborate with universities in Australia (EnTox in Queensland) and Europe (VU Amsterdam, the Netherlands and Oerebro University, Sweden), have got own projects so that they have a more sustainable operational basis. As a result, they are the regional coordinator for the UNEP/GEF project for the Pacific Islands and are now able to train and assist the other countries in the project (six countries with GEF funding plus two additional with additional funding). They have become a regional center for the Pacific Islands. This role will be strengthened through the project and is backed-up at the political level.

- Where operational POPs laboratories exist and where sustainability of these laboratories is given, it is mandatory that the laboratories are capable to produce good results in their own laboratory; therefore, training preferably is undertaken in their environment and under their conditions. Notwithstanding participation at training courses abroad can add value.

- To obtain high quality analytical data - and especially for complex mixtures of compounds like POPs pesticides and PCB or dioxins/furans - expertise is build up stepwise. It cannot be expected that the first analyses will generate the right data; methods and protocols have to be well established in a laboratory and must be specific for the chemicals of interest and the matrices.

- A laboratory experienced and producing acceptable results for one matrix, e.g., soil, will not necessarily generate acceptable results in another matrix, e.g., mothers' milk.

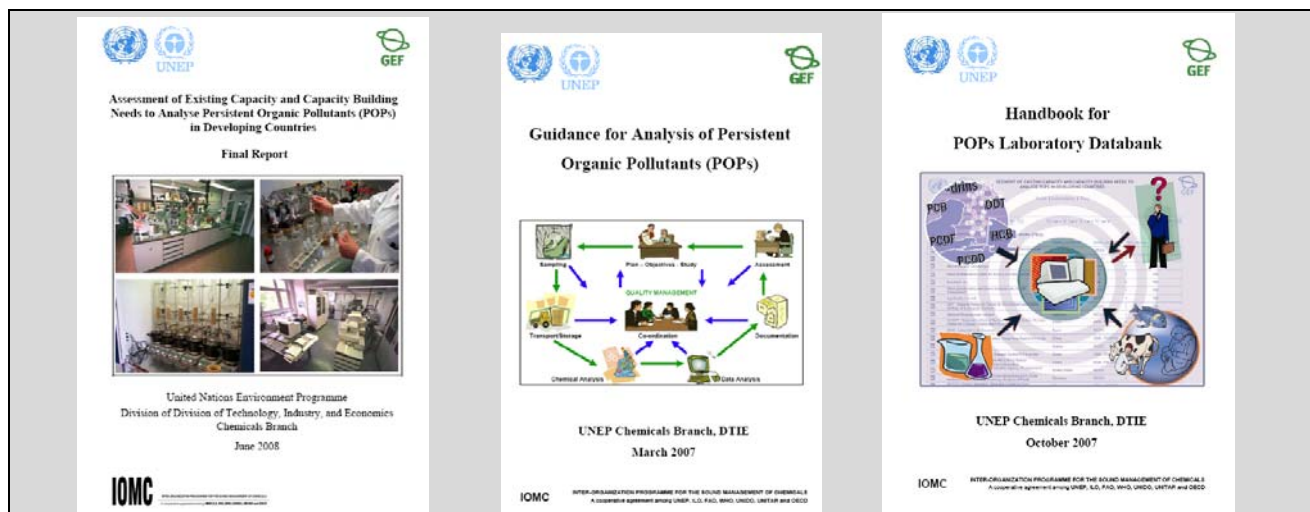
- An important observation is that typically technicians do not receive training; there are no curricula for non-academic personnel. With continuous changes of personnel or instrumentation, the laboratory procedures (methods, protocols, etc) have to be validated again. More time has to be spent on quality assurance and quality control issues (as a rule of thumb: 20% of time).

- Besides an adequate infrastructure and institutional support, well trained and motivated staff are key to success. Further, there are three criteria to prove good performance:

1. Accreditation for the chemicals (e.g., POPs pesticides, PCB, PCDD/PCDF) and matrix (e.g., soil, sediment, water, fish or food in general, air) according to ISO 17025 (or equivalent)

2. Sufficient number of samples analyzed per year according to POP and matrix (e.g., more than 50 samples annually each)

3. Successful participation in international laboratory intercomparison studies (preferentially each year but at least all three years; according to matrix and POP).



11. Constrains and challenges regarding waste

Challenges of solid waste management; landfills.

Poor waste management is ubiquitous in SIDS and with limited land area, improvement of waste management is vital for improving the health and livelihoods. Incomplete combustion processes through open and uncontrolled burning are common affairs. It has been inferred that the major releases of POPs are from waste incineration (with fly ash being released into the air) and uncontrolled combustion (through open and uncontrolled burning). Proximity to water sources and limited availability of land poses challenges for design and operation of engineered landfills. Due to small size of each country the viability of recycling options is usually quite difficult. This is further exacerbated due to low demands of recycled materials. Capacity for developing and implementing waste management plans, including policy and technical measures is rather limited. Limited financial capability of governments and municipal authorities dissuades implementation of modern technical solutions. Finally, there seems to be a lack of political will to give a priority to waste related issues.

Challenges in disposal of chemical and hazardous waste.

There are special challenges in SIDS with regards to disposal of chemical and hazardous waste. Firstly, these wastes require use of high technology which most likely will not be available locally. Secondly, operation of such facilities is a specialized job and the countries may not have the requisite skills and expertise. Also, these technologies could be quite expensive and it may be difficult to garner adequate financial resources. In larger countries some of such waste (e.g. solvents, waste oils) can be disposed off in high temperature kilns but such facilities may not be available in SIDS. These wastes also require a robust and effective regulatory mechanism to track the waste from its source of generation to final disposal. Other infrastructural requirements such as safe and reliable transportation, analysis and inventORIZATION, safe temporary storage may also not be available in SIDS.

Status of recycling efforts

Due to their relatively smaller waste volumes (and thus low economic viability), lack of markets for recycled materials, excessive transportation in case the recycled materials are exported, and lack of availability of technologies and finances, the recycling efforts in SIDS are rather limited. The metal constituent of waste (waste aluminum cans, scrap metals etc.) are the most recycled constituents. Recycling of paper and plastic suffers because of above reasons. Converting organic waste into gas/compost is rather limited due to limited market of compost as well as absence of segregation practices. Recycling/reuse of industrial is very low because of low number of industries and lack of matching between industrial waste producers and possible users.

Overall impact on health and human settlements

The impact of improper waste management in SIDS could be worse in SIDS because of high local population density and topography. Contamination of land and water bodies due to seepage of leachate from waste dumps is a common

affair. The indiscriminate dumping often accompanied with open burning gives rise to air emissions. The adverse impacts on health of communities living around dump sites is very severe.

D. Coastal and marine resources

12. Lessons learnt and good practices from the WIO-LaB Project

The broad goal of the Project “Addressing land-based Activities in the Western Indian Ocean (WIO-LaB)” is to combat the degradation of the marine and coastal environment due to land-based activities in countries bordering the Western Indian Ocean (WIO). The Project is designed to serve as a demonstration project of UNEP’s Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA) and aims to achieve three specific objectives: (i) Improve the information base and demonstrate guidelines and strategies for the reduction of stress to the ecosystem by improved water and sediment quality; (ii) Strengthen the regional legal basis for preventing land-based sources of pollution; and (iii) Develop regional capacity and strengthen institutions for sustainable, less polluting development. SIDS Countries participating are: Comoros, Madagascar, Mauritius, Seychelles. Project activities in these countries are coordinated by the National Focal Points (NFPs) for the Nairobi Convention

The WIO-LaB project is implementing nine demonstration projects, which are piloting innovative approaches to addressing the main challenges faced by the region. Several projects focus on the application of constructed wetlands systems for wastewater treatment, a cost effective method of using natural cleansing capacity of wetlands for treating municipal wastewater, for which sample schemes are developed in Mombasa (Kenya), Pemba (Tanzania) and Mahé (Seychelles). These projects have been designed to be low cost in construction and maintenance in order to ensure sustainability, while producing significant environmental, social and economic benefits in the region as well as contributing to MDG and WSSD targets on sanitation; the three projects together will directly improve the living conditions of over 10,000 people by providing badly needed sanitation facilities while achieving international standards for wastewater discharges and therewith reducing pressure on sensitive ecosystems; all three projects are furthermore targeting areas that are important for tourism, therewith generating important economic spin-off along the way.

Other demonstration projects address for example the challenges of community-based management of coastal zones and sensitive habitats such as mangrove forests, through participatory approaches involving local community groups. Projects to this extent are being undertaken in ecologically important parts of the Comoros, Madagascar and Mozambique. The key to these projects lays in the improvement of the living conditions of the population through the development of sustainable alternatives - such as ecotourism and aquaculture - for existing unsustainable practices - such as the over-exploitation of fishery and mangrove forest resources. The focus on livelihoods herein assures the buy-in of the local population. The knowledge and the visibility generated through these demonstration projects has in particular contributed to the high level of stakeholder involvement and support obtained, with important spin-offs for the future.

13. The Global Programme of Action for the Protection of the Marine Environment from land-based Activities (GPA) continues to provide technical and financial assistance to small island developing States in response to the specific call made in the Mauritius Strategy, which also requests that relevant initiatives address the vulnerability of small island developing States. Continuing projects and activities include:

(a) Technical and financial support to countries of the Western Indian Oceans for addressing priority problems through pilot/demonstration projects:

- *Mauritius : Solid Waste Management in Port Louis Harbour*

The project aims at demonstrating an integrated approach to the management of solid waste in the Port Louis Harbour. The project includes activities for the prevention of influx of domestic waste into the port area, the influx of oily and other wastes from onshore and offshore activities and the collection and disposal of such wastes in an environmentally safe manner. The project is based upon a strong partnership between government, the Port Authorities, port users and other stakeholders.

The project contributes to stop and control the influx of domestic waste entering the Port Louis Harbour through inter-agency cooperation (Port Authority of Mauritius, Ministry of Environment, Ministry of Finance, Municipality of Port Louis, Association of Shipping Agents and other Port stake holders), and helps the Government of Mauritius to deal with pollution problems at source in an environmentally safe manner by quick removal of waste in port area and safe disposal of waste through controlled burning.

- *Mauritius: A pilot project to determine the potential use of native species to control soil erosion within the Black River Gorges National Park*

The project aims at reducing the land based pollution in the form of terrigenous sediments that enter Morne lagoon through the Black River (Rivière Noire). The Morne lagoon is an important marine ecosystem that supports local fisherman community. A large part of the lagoon has been declared a fishing reserve where fishing activities are regulated.

The land that now constitutes the park's was cleared some decades ago to pave way for deer farming activities and has been completely overgrown by shallow rooted exotic species that have little control on soil erosion. The project's main goal is to replace the exotic species growing on Remus Plateau with native species. The project proposes, in the first instance to restore ten hectares of degraded forest of 'Plateau Remus' with endemic plants. It is expected that the restoration of the indigenous vegetation will reduce the rate of soil erosion in the park and therefore lead to an improvement in the quality of the river water flowing into the Morne lagoon and subsequently result in beneficial effects on the lagoon marine ecosystem. It is also expected that this will enhance the productivity of the lagoon and in particular, help in sustaining fish catches in the lagoon. The project will furthermore provide an improvement of the aesthetic and or tourism value of the Park, which will contribute the sustainability of the Park.

The project also aims at developing a protocol for the use of endemic plants for the restoration of degraded lands for eventual application in both the Black Gorges National Park and the privately owned lands in Mauritius, as well as throughout the Western Indian Ocean region.

- *Seychelles: "Small-scale Decentralized Wastewater Treatment and Disposal through a horizontal Subsurface Flow Constructed Wetland"*

This project aims to demonstrate cost effective solutions to address treatment of wastewater outside the sewered areas of the country. In addition the project also addresses capacity building for wastewater management at the local level and disseminates information on that particular approach at the local and regional levels. The project is implemented by the Housing Planning and Implementation Division of the Ministry of National Development with support from the Division of Environment of the Ministry of Environment, Natural Resources and Transport, Water and Sewerage Division of the Public Utilities Corporation, Seychelles Bureau of Standards, Ministry of Health and Seychelles Broadcasting Corporation.

The project will provide experiences and the impetus for further expansion of much needed individual treatment systems and provides a test bed for government to evaluate the implication for installing decentralized treatment systems at the different high density housing developments that are currently having wastewater problems.

The development of this project is supported by the Waste Stabilization and Constructed Wetland Research Project of the University of Dar es Salaam in Tanzania, which has been acknowledged by the Nairobi Convention and Project "Addressing land-based Activities in the Western Indian Ocean (WIO-LaB)" as a regional knowledge centre on constructed wetland technology for the WIO region, and as such has been acting as a technical advisor for various WIO-LaB Project demonstration projects, in particular in Tanzania and Kenya.

- *Comoros: "Development, protection and integrated management of the coastal zone at Itsamia, Mohéli"*

The project aims to abate the negative impacts brought about by human pressures and certain natural phenomena (rise in sea level, erosion etc) on the coastal zone of Itsamia. This concept of integrated management, by means of the planned activities, will make it possible to recommend and implement concrete measures to remediate the environmental problems associated with the coastal zone; these problems relate especially to uncontrolled dumping of household waste on the beaches, sand extraction, turtle poaching and coastal erosion. Through a consultative process involving the community of Itsamia and other partners, the principal activities within the framework of the project will be (i) the installation of a controlled landfill and the implementation of systems for collection and management of solid waste; (ii) reforestation of parts of eroded parts of the coastal zone, and establishment of a protocol for the co-management and the regulation of access to eroded zones with the community; (iii) the construction of an observatory for the surveillance of beaches frequented by marine turtles (against poaching); and awareness raising and education activities.

In order to ensure the sustainability of these activities and investments, the project also aims at strengthening the capacity of the Association for the Socio-Economic Development of Itsamia (ADSEI), which is a community-based

association involved in the socio-economic development of the village, and more specifically, is responsible for the environmental management of the coastal zone and its resources. The ADSEI is already actively engaged in activities such as the operation of an information center on marine turtles (Maison des Tortues), beach surveillance against poaching, the fight against uncontrolled dumping of household refuse and monitoring of marine turtles. The association also operates two small bungalows for tourists and offers modest catering facilities and eco-guides for marine turtle watching. Part of the income generated from the latter activities will be used for projects to develop the village of Itsamia, such as water supply and the construction of a health centre.

(b) As regards chemicals management and eutrophication due to high nutrient levels in water, and its impact on key coastal industries and sustainable livelihoods of coastal communities, which is an issue of the thematic cluster for CSD 18, Phosphorus and nitrogen compounds entering coastal waters from point and non-point sources are the nutrients most responsible for nutrient enrichment (eutrophication) due to their primary role as growth limiting factors for phytoplankton and aquatic plants. Significant non-point nutrient sources include agriculture and urban runoff, intensive livestock activities and atmospheric deposition. Throughout the world, excess nutrients from e.g. agricultural runoff and municipal or private sewage over fertilize ocean and coastal areas, leading to the creation of numerous 'dead zones' where virtually no life can exist. Point sources include inadequately treated municipal sewage and industrial waste.

The number of known 'dead zones' has doubled since 1990 and is increasing as a result of intensified agricultural-related activities and accelerating urbanization. The discharge of nutrients into coastal waters is a major cause of eutrophication, especially in areas of limited water circulation. The presence of nutrients in the water column enhances the growth of plants, sometimes causing algae to overgrow the corals or seagrasses that were previously present. Habitat degradation, in turn, causes decreased fisheries production and loss of recreational and tourism potential, affecting coastal communities dependent on these industries.

In general, eutrophication from human activities is usually confined to the vicinity of coastal discharges but, because of both the multiplicity of such discharges and regional atmospheric transport of nutrients, such affected coastal areas can be extensive. The effects of the enhanced mobilization of nutrients are enhanced productivity but these can also result in changes in species diversity, excessive algal growth, dissolved oxygen reductions and associated fish kills and, it is suspected, the increased prevalence or frequency of toxic algal blooms or "red tides". These may impact on the quality of seafood for human consumption, thus having an enormous economic impact. The decay of the large masses of algae themselves may cause the depletion of oxygen, affecting water quality and resulting in the disappearance and mass mortality of many other aquatic species. High nutrient levels also have been associated with the bleaching of corals, also influencing biodiversity.

Levels of nutrients in the environment show a substantial regional variation. Biological communities, adapted to available levels, may elicit both negative and positive impacts of nutrient addition. Many of the impacts nutrients have on coastal and marine environments are due to an over-enrichment with nutrients. Riverine fluxes have increased threefold in some regions, and atmospheric deposition has increased an order of magnitude in many parts of the world.

Addressing the impact of nutrients and sewage on marine environments are two out of the nine pollution source categories identified by the GPA. More generally, the objective of the GPA is to support States in: identifying marine areas where nutrient inputs are causing or are likely to cause pollution; reducing nutrient inputs and the number of marine areas where eutrophication is evident; and protection and restoration areas of natural denitrification. The World Summit on Sustainable Development specifically identified the need to advance the implementation of the GPA in relation to nutrients.

The Global Partnership on Nutrient Management (GPNM), a partnership of scientists, policy makers, private sector, NGOs and international organisations, was formed to address the growing problem of nutrient over-enrichment. The partnership will provide a web-based platform, presenting information on major emission sources and impacts, cross-media transfer of nutrients, environmental costs of over-enrichment, and an identification and analysis of impacts in coastal areas and Large Marine Ecosystems (LMEs).

The Partnership was launched formally by UNEP on 6 May 2009 at the UN's Commission on Sustainable Development, in collaboration with the Governments of the United States and the Netherlands. Other key partners are the Governments of Italy and Germany, the European Union, the International Fertilizer Association (IFA), the International Nitrogen Initiative (INI) and the FAO. The first partnership meeting was held on October 22-23 in The Hague, where developed and developing country participants discussed how to share information and best practices through the newly designed web-based platform.

A key focus will be on facilitating implementation partnerships between and within countries. Using the web-based information provided by the GPNM, such partnerships involving stakeholders from different countries and disciplines, will be able to identify the necessary research, policies, partners, tools and training to make informed on the ground interventions. In turn, information, approaches and lessons learned from these interventions would be made available to all partners for future use.

The GPNM will be a key initiative to help implement the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA), a non-binding multi-lateral environmental agreement addressing the links between watersheds and coastal systems using an ecosystem management approach. The UNEP/GPA provides the Secretariat of the GPNM.

(c) Regarding chemicals management and the impact of use of pesticides and fertilizers on groundwater, rivers and coastal waters, which is an issue of the thematic cluster for CSD 18, information collected through various projects and activities shows that the majority of non-point source pollutants originate in agricultural or urban areas. Pesticides move from the site of application via drift, volatilization, leaching, and runoff. Examples of pesticides include polychlorinated biphenyls (PCBs), trihalomethanes (THMs), organochlorinated (e.g. DDD, DDE and DDT), organophosphate pesticides (e.g. malathion and parathion) and herbicides.

The environmental fate of a pesticide is governed by the natural affinity of the chemical for: solid matter (mineral matter/particulate organic carbon), liquid (solubility in surface/soil water), gaseous form (volatilization), or biota. The impact on water quality by pesticides is associated with active ingredient in the pesticide formulation, contaminants, additives, and degradates (may have greater, equal or lesser toxicity than the parent compound e.g. DDT degrades to DDD and DDE). In addition, the characteristics of pesticides determine how they act in the environment: toxicity (LD₅₀ or Lethal Dose concentration killing half of the test organisms), mobility, half-life (time required for the ambient concentration to decrease by 50%), degradates, and persistence (half-life, time required for the ambient concentration to decrease by 50%). Persistence is determined by biotic processes such as biodegradation and metabolism; and abiotic degradational processes including hydrolysis, photolysis, and oxidation.

Degradation of water quality by pesticide runoff has two principal human health impacts. The first is the consumption of fish and shellfish that are contaminated by pesticides; this can be a particular problem for subsistence fish economies that lie downstream of major agricultural areas such as in many SIDS. The second is the direct consumption of pesticide-contaminated water. In SIDS, this is of particular concern due to high dependency on fisheries; direct runoff into the sea due to short distances; and because of limited groundwater resources.

Groundwaters are adversely affected through leakage of pesticides and nutrients (N and P) from agricultural application, poor disposal practices or dumping. Contamination of ground water is of concern because ground water supplies populations with drinking water and once polluted, it may take years for the contamination to dissipate or be cleaned up. Cleanup may also be very costly and complex, if not impossible.

The impacts of pesticides on organisms and ecosystems vary widely from acute to minor based on their chemical properties and behaviour in the environment. Discharge of large quantities of pesticides results in acute toxicological effects and mass kills of freshwater and marine organisms such as fish. Others, such as organochlorides and PCBs are extremely persistent and tend to increase in concentration up the food chain (biomagnifications) causing chronic effects. The majority of pesticides which pose long-term threats are those which strongly associate with organic matter and sediments thus being readily available to marine organisms. They are very resistant to degradation and because of their high toxicity; high bioaccumulation as well as carcinogenic properties are of major health significance.

Ecological impacts are due to eutrophication (for nutrients) and through pesticide contaminated water. The two principal mechanisms for pesticides impacts are bioconcentration and biomagnification. As many effects are chronic, they are difficult to detect, yet have consequences for the entire food chain. These include death, cancers, tumors and lesions on fish and animals, reproductive inhibition or failure, suppression of immune system, disruption of endocrine (hormonal) system, cellular and DNA damage, teratogenic effects, and intergenerational effects (effects are not apparent until subsequent generations of the organism). These effects may be associated with a combination of environmental stresses such as eutrophication and pathogens and are not necessarily caused solely by exposure to pesticides

Ecological effects of pesticides extend beyond individual organisms and can extend to ecosystems and biodiversity within them. In addition to chemical and photochemical reactions, there are two principal biological mechanisms that cause degradation of pesticides. These are (1) microbiological processes in soils and water and (2) metabolism of pesticides that are ingested by organisms as part of their food supply. While both processes are beneficial in the sense that pesticide toxicity is reduced, metabolic processes do cause adverse effects in, for example, fish. Energy used to

metabolize pesticides and other xenobiotics (foreign chemicals) is not available for other body functions and can seriously impair growth and reproduction of the organism.

(d) The GPA and its partners are implementation of a capacity-building programme improving municipal wastewater management through improving skills and knowledge needed for project identification, planning and financing at the municipal level in the areas of water, sanitation and wastewater management. (See para 9 (a) above).

(e) Mainstreaming coastal and marine issues in national development planning and budgetary processes:

- Four regional workshops (Chennai, India in November 2007; Port Louis, Mauritius, May 2008; Kingston, Jamaica in July 2008; and Guayaquil, Ecuador, in July 2009) with participation of the SIDS countries in the relevant regions to support their efforts in mainstreaming coastal and marine issues in the national development planning and budgetary processes; sharing of national level experiences in integrating coastal and marine environmental issues into national development plans and budgets; new understanding of the mainstreaming approach and created new incentive to expedite the mainstreaming process.
- Ongoing collaboration between NOAA and UNEP Division of Environmental Policy Implementation (DEPI) I related to the development, management and protection of the coastal and marine environments from pollution originating from land-based activities and physical alterations and destruction of habitats undertake activities along the coast within the Wider Caribbean region. SIDS under the collaboration MoU, expected to run to 2011, include Trinidad & Tobago, Grenada, Dominica, Dominican Republic. Through the GPA Node, NOAA will provide technical assistance to enhance national and regional capacities to design and implement National Programmes of Action (NPA) and watershed management strategies to address land based sources of pollution and mainstreaming NPA activities into national budget and planning processes.

(f) Technical support to small island developing States to develop their national programmes of action to tackle land-based sources of marine pollution as case studies for the Pacific region and the Caribbean. In the Pacific Tonga, Kiribati and Vanuatu were supported. In partnership with the Secretariat of the Pacific Regional Environment Programme, coordination of a regional project to facilitate operation of the Council of Regional Organizations in the Pacific working groups associated with Global Programme of Action-related initiatives was carried out, as well as support provided to national Governments to develop national plans of action and align them with national sustainable development strategies. In the Caribbean UNEP/DEPI and NOAA have undertaken joint activities with regards to the development of National Programmes of Action (NPAs); implementation of small-scale pilot interventions, including project development assistance in priority areas such as wastewater management, nutrients and marine litter; work with nations in the Wider Caribbean to link crosscutting environmental policies with efforts to mainstream initiatives developed in the NPA process into national planning and budgetary processes; and integrate climate change vulnerability mitigation into the NPA process and use NPAs as an adaptation tool to address future and projected climate change impacts.

14. The project on integrated management of watersheds and coastal areas in small island States in the Caribbean will strengthen the commitment and capacity of participating countries to implement an integrated approach to the management of watersheds and coastal areas. Nine Demonstration Projects have been implemented, focusing on thematic issues related to Water Resources Conservation and Management; Wastewater Treatment and Management; Land-Use Planning, Zoning and Alternative Practices; and Targeted Model IWCAM. Other activities being implemented include: Development of IWCAM Indicators template; A Legislative, Policy and Institutional Inventory with Toolkit for Harmonizing Laws and Institutions prepared; Support for regional IWRM activities and for the preparation of Integrated Water Resources Management Plans in participating countries; A Capacity Assessment of Geographic Information Systems (GIS) Capabilities and preparation of Roadmap for Effective Mainstreaming of GIS for Watershed Management in the Caribbean; Laboratory capacity assessments for laboratories in five participating countries; Training in Environmental Indicators, Communications, and Community-based Resource Assessment; Communications, outreach and production and dissemination of Public Awareness materials. Beneficiary countries are Barbados, Cuba, Dominica, Dominican Republic, Grenada, Haiti, Jamaica, St. Kitts and Nevis, Saint Lucia, St. Vincent and the Grenadines and Trinidad and Tobago.

15. The project on demonstrations of innovative approaches to the rehabilitation of heavily contaminated bays in the wider Caribbean will implement a pilot project for the construction of a sewage treatment plant in the Luyano River area, identified as the main source of pollution to Havana Bay, in Cuba, to remove nitrogen and phosphorus; address the problem of eutrophication resulting from excess inputs of nutrients to the coastal zone and adjacent international waters.

16. The second regional overview of land-based sources and activities in the wider Caribbean region provides updated information on all point and non-point source discharges into, or impacting, the area of the Cartagena Convention; establishes a new baseline from which to measure progress under the protocol concerning pollution from land-based sources and activities to that Convention; and confirms or reconfirms priority sources and pollutants in the Wider Caribbean, including heavily contaminated bays.

17. Workshops have been convened under the auspices of the protocol concerning pollution from land-based sources and activities to the Cartagena Convention, focused on creating national awareness of the protocol and strengthening the capacity of countries to ratify, accede to, and implement the protocol.
18. The project on implementation of the regional action plan for the sustainable management of marine litter has supported further environmental protection and sustainable development of the wider Caribbean region through the continuing implementation of the plan. Under the project compilations and dissemination of lessons learned took place and it is expected that this will allow the development of strengthened related legislation and policy requirements, monitoring and economic assessment mechanisms and improved education through awareness programmes to reduce marine litter nationally with regional impacts. Three pilot countries were selected for pilot implementation, i.e., Barbados, St. Lucia and Guyana. A workshop on marine litter and the implementation of the International Convention for the Prevention of Pollution from ships, 1973, as modified by the Protocol of 1978 relating thereto, was held to review the draft regional action plan for the sustainable management of marine litter and the implications of the special area status of the Caribbean Sea as detailed in annex V of the Cartagena Convention.
19. The International Year of the Reef 2008 was implemented in the Caribbean through the regional Coral Reef Consultation for the Wider Caribbean, which ascertained the types of new science that are needed to improve coral reef management regionally and how existing science can best be applied to help regional managers. Support was also given to the conservation and sustainable use of coastal and marine ecosystems, including International Coral Reef Initiative activities.
20. Regional training-of-trainers course in marine protected area management have dealt with all aspects of management of such areas in the Caribbean. The 6th course in 2008 focused on Cuba and the Dominican Republic.
21. The wider Caribbean region, through the development of a Caribbean Regional Fund for Wastewater Management (CReW), will help mobilize greater investments in wastewater management, including treatment facilities. In the context of the protocol concerning pollution from land-based sources and activities to the Cartagena Convention, the project will provide sustainable financing for the implementation of environmentally acceptable, sustainable and cost-effective wastewater management measures.
22. Implementation of the project on reduction of environmental impacts from tropical shrimp trawling, through introduction of by-catch technologies and change of management, aims to reduce discard and by-catch and to train and provide relevant capacity building. Also legal frameworks and mechanisms to monitor, control and enforce new regulations will be developed.
23. The project on combating living resource depletion and coastal area degradation in the Guinea Current large marine ecosystem through ecosystem-based regional actions is focused on developing solutions to the priority problems and issues identified by the 16 countries within the Guinea Current area –among which Guinea-Bissau and Sao Tome and Principe- that have led to unsustainable fishing and use of other marine resources, together with the degradation of marine and coastal ecosystems by human activities. The project focuses on nine demonstration projects, designed to be replicable and to demonstrate how specific actions can lead to dramatic improvements.

24. UNEP is leading the project to implement sustainable integrated water resource and wastewater management in Pacific island countries to strengthen the enabling environment for the implementation of the Strategic Action Programme for International Waters of the Pacific Islands Region to promote sustainable development. Beneficiary SIDS are Cook Islands, Fiji, Kiribati, Marshall Islands, Micronesia, Nauru, Niue, Samoa, Solomon Islands, Palau, Papua New Guinea, Tonga, Tuvalu and Vanuatu. During the project preparation, national diagnostic studies, hot spot analysis and demo proposals were conducted.

25. The UNEP Shelf Programme, managed by UNEP/GRID-Arendal, has been providing data and training to experts from developing countries, including Small Island Developing States (SIDS), on the delineation of the outer limits of the continental shelf. The map shows the potential continental shelf beyond 200 nautical miles around Africa. Grey areas would qualify as part of the continental shelf beyond 200 nautical miles as identified by the UNEP Shelf Programme preliminary study. The process of the delineation of the outer limits of the continental shelf is driven by the 1982 UN Convention on the Law of the Sea (UNCLOS). The seabed and the subsoil of the continental shelf constitute the outermost maritime zone over which coastal states have jurisdiction. Coastal states that were early to ratify UNCLOS are due to submit information on the outer limits of the continental shelf by May 2009. Some developing states are experiencing difficulties in finishing the technical work involved in the delineation. The support given by the UNEP Shelf Programme has been instrumental in the advancement of this technical work. Data were provided to 15 countries, training was given to experts from 26 countries and technical advice was provided to an additional five countries. Once the delineation process is completed, coastal states will have responsibility for protecting the environment and managing the resources of these areas of the seafloor.

26. Coral-reef related activities in small island developing States have been undertaken by the UNEP Regional Seas programmes and through the International Coral Reef Action Network. The following activities have been implemented, among others:

(a) Coral reef initiative for the South Pacific (CRISP) has undertaken activities which address: enhance integrated governance for effective management of island (coastal) resources at all levels; engendering public support for sustainable coastal and marine resource management at all levels; and building capacity and access to appropriate methodologies and technologies

(b) South Asia marine conservation and protected areas project (MCPA), which addresses the improved management and operation of MCPAs; work alongside coastal communities to enhance their livelihoods and develop and assist them to take up more sustainable livelihood activities, moving away from reef degradation; and establish a task force to promote a regional response to environmental challenges, to improve regional cooperation and coordination of management and conservation efforts, and to assist participating countries to learn from each other's experiences.

(c) Coastal and marine management and education in the South-Eastern Caribbean. To strengthen coral reef management, monitoring, outreach and education programmes in the region, engage stakeholders and encourage support for the creation of new marine protected areas and long-term management needs.

27. The project on implementing integrated water resource and wastewater management in Atlantic and Indian Ocean small island developing States is addressing water and marine-related constraints and barriers through the development of integrated water resource management mechanisms and water use efficiency strategies. The overall objective of the project is to accelerate progress, towards World Summit on Sustainable Development (WSSD) targets on Integrated Water Resources Management (IWRM)/Water Use Efficiency (WUE) national plans and; water supply and sanitation Millennium Development Goals (MDGs). The current activities underway include the preparation of State of the coast reports of Comoros, Seychelles and Mauritius; Pollution status reports (also for Comoros, Seychelles and Mauritius); report on the review of the environment management plan for Seychelles (EMPS) 2000-2010. National Diagnostic and Hotspots analysis for Comoros, Seychelles, Mauritius have been conducted. The reports have analyzed the current status, priority issues (hotspots), threats, causes and barriers related to IWRM/WUE, marine litter, and wastewater management in WIO SIDS. Other expected outputs include (i) National Diagnostic and Hotspots analysis reports for Maldives, Sao Tome and Principe and Cape Verde; and (ii) National Assessment reports on policy, legal, institutional and capacity gaps regarding IWRM/WUE and wastewater management.

Demonstration projects will be developed based on the findings of the National Diagnostic Analysis and Hot Spot analysis, and on national consultations. An IWRM monitoring and evaluation framework will also be developed. The expected outputs are (i) Indicators for long-term monitoring identified (based on International Waters Indicators); (ii) Data analysis and tracking framework developed; (iii) Assessment report on capacity of institutions to monitor IWRM; (iv) Gender aspects integrated; and (iv) Capacity development program developed.

28. The demonstration Project on Marine and Coastal Ecosystem-based Management in Kimbe Bay, Papua New Guinea (PNG) aims at supporting integrated policy and management development through national consultations, assessment of key ecosystem drivers, development of cross-sectoral policy and management responses, introducing and tailor-making key concepts of integrated environmental assessment and management.

A National workshop on Integrated Environmental Assessment and Ecosystem-Based Management (EBA) was organized in August 2009 by the PNG Department of Environment and Conservation (DEC) through close collaboration and financial support from UNEP to: (a) Identify environmental issues and cross-sectoral policy and management responses; (b) organise and initiate a national Integrated Environmental Assessment and Climate Change Outlook, including training in IEA methodologies; and (c) introduce key principles and operational approaches on marine and coastal ecosystem-based management (EBM) and plan a 6-month marine & coastal EBM demonstration project in the Kimbe Bay region.

The six-month EBM demonstration process, running between October 2009-March 2010, has the following components: (a) Review of lessons from previous PNG marine and coastal ecosystem and resource management programs taking note of the barriers and constraints in designs, approaches and outcomes; (b) Collation of existing biological, social and economic information on Kimbe Bay and to develop this information into a form that can assist management planning using the EbM approach; (c) Development of conceptual planning model and scenarios ecosystem-based management of suite of representative PNG marine and coastal ecosystems, ensuring sustainable environmental and economic development, using the EBM model for Kimbe Bay (based on existing information, no extensive field data collection will be undertaken); and (d) capacity development within DEC and other agencies where possible to understand EBM and to use these skills and experience to assist with international and national marine programs that are already being designed for PNG.

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29. Through the provision of Regional Support to Caribbean Challenge it is expected that eEnhanced coherence and financial sustainability of a large-scale transboundary (national and ecoregional) Caribbean MPA Network consistent with **GLISPA** commitments will be attained. Expected outputs are: (a) National MPA Project Coordinators participating in Annual Caribbean Challenge Regional Coordination Meeting; (b) Established regular regional communications system; (c) An agreed valuation on regional prioritization of MPA site selection for the Caribbean Challenge; (d) Agreed regional Caribbean Challenge MPA monitoring and evaluation framework based on appropriate indicators, among others.

30. *Effectiveness of implementation support and mechanisms, including monitoring systems*

Data and assessments are often support good implementation. One example of where this has been carried out, in conjunctions with a comprehensive monitoring programme is the 'Assessment and Management of Environmental Pollution (AMEP) Atlas' produced for the Caribbean Environment Programme. Under the Caribbean Environment Programme, an effective monitoring system has been set up to assess Sewage, Oil Hydrocarbons, Sediments, Nutrients, Pesticides, Solid Waste/Marine Debris, and Toxic Substances across the wider Caribbean region.

Over the last 2 years AMEP has achieved a comprehensive overview of land-based point sources of marine pollution in the Wider Caribbean Region, (in which information from 25 countries has been included) where it was found that oil refineries constitute the most significant source of industrial marine pollution in the Wider Caribbean, contributing approximately 70% of the total BOD load and over 80% of the total oil and grease discharged from industrial point sources in the region.

The work of AMEP also highlighted the negative impact of organic matter and bacteriological pollution on coastal ecosystems and the risk to public health is increasing as a result of the lack of adequate systems for the treatment and control of domestic wastewaters. This work was comprised of a firm foundation for a regional response to some of the shared issues affecting the marine environment in the Caribbean.

31. *Recent trends and emerging issues*

Marine and coastal ecosystems are among the most productive natural environments and provide a wide range of social and economic benefits essential for human well-being in coastal countries. Furthermore, the health of the ocean, the status of the world's climate and the welfare of human societies are inextricably linked. The ocean plays an important role in determining climate by transporting heat around the globe through ocean currents or sinking carbon dioxide out of the atmosphere – the oceans account for about 55% of the world's total biological or green carbon

captured by living organisms. Increasing our understanding of the role of the oceans in Climate Change is an urgent issue and an expanding area of research work.

Current emerging trends include ocean warming, which contributes to sea-level rise and mass coral bleaching events (the world has effectively lost 19% of the original area of coral reefs since 1950), as well as ocean acidification. Since the industrial revolution, the ocean has become 30% more acidic which affects the ability of shelled organisms to calcify, having negative knock-on effects throughout the food chain. This could seriously impact on the world's fisheries and subsequently on the food security of coastal populations.

Coastal ecosystems across the globe continue to be threatened by urban expansion, ribbon development, poor management of watersheds and the destruction of habitat. As much as 91% of all temperate and tropical coasts will be heavily impacted by development by 2050. Key threats to coastal ecosystems, including coastal plains, headlands, estuaries, deltas, intertidal zones, bays and near-shore marine waters, include: oil spills; untreated sewage and industrial wastewater; heavy siltation; nutrient enrichment; invasive species; persistent organic pollutants (POPs); heavy metals; radioactive substances; marine litter; overfishing; unchecked development; and the physical alteration and destruction of key coastal habitats, such as mangroves, wetlands, foreshore dune systems, coral reefs and seagrass meadows. These impacts will be compounded by sea level rise, acidification and the increased frequency and intensity of storms that easily break down and damage beaches and coast lines. The cumulative effect of these pressures is severely reducing the productivity of coastal ecosystems vital for human life and economic development.

In 2009 UNEP developed a Marine and Coastal Strategy that focuses on building national capacity for adaptive ecosystem-based management of human activities. This includes cross-sectoral solutions for reconciling multiple and competing uses of ecosystem services and their cumulative impacts on long-term ecosystem function.

E. Freshwater resources

32. Rainwater harvesting is currently being promoted to increase the availability of freshwater resources in small island developing States in the Caribbean -previously in the Pacific, and to develop regional rainwater harvesting strategies and awareness-raising, GIS maps for planning and field demonstration projects.

33. The project on integrating management of watersheds and coastal areas in small island States in the Caribbean supports SIDS to strengthen the commitment and capacity of the participating countries to implement an integrated approach to the management of watersheds and coastal areas. (See para 12 above).

34. The 2007–2008 project to evaluate needs assessment guidance to develop national plans for domestic wastewater pollution reduction through implementation of sewerage needs assessment pilot projects in the wider Caribbean is a follow-up to the sewage collection and treatment project, which was designed to assist Contracting Parties to the Cartagena Convention and other Caribbean environment programme member States in meeting sewage-specific obligations contained in the protocol to that Convention. Specific objectives were: a) To assist in the development of national plans for two selected pilot countries to comply with the requirements of the LBS Protocol with regard to domestic wastewater; b) The testing of the national sewage treatment needs-assessment guidance developed as an output of the earlier project and also the proposed classification scheme for receiving waters under the LBS protocol.

35. In 2008 a regional workshop on environmentally sound water and wastewater services at the community level in the Caribbean provided for the sharing of innovative environmentally sustainable methods of water provision and wastewater treatment primarily at the community level. Environmentally Sound Technologies (EST) in the provision of sanitation and water at the community level were reviewed and regional opportunities for funding for further action discussed. One of the proposed initiatives highlighted at the workshop is the establishment of a Caribbean Revolving Fund for Regional Wastewater Investment and Management (CReW). (See para 19 above).

F. Land resources

36. The Partnership Initiative on Land Degradation and Sustainable Land Management has been initiated to assist Caribbean small island developing States in addressing the issues of sustainable land management, rural development and alternative livelihood development through the elaboration of integrated sub-regional Action Plans (SRAP), the development of tools and methodologies for monitoring land degradation, South-South cooperation in particular between Caribbean SIDS themselves and Caribbean SIDS and Latin American countries, as well as targeted GEF interventions. Important outputs so far achieved are: Technical Assistance for the preparation of National Action Plans/UNCCD; Establishment of Sub-Regional Action Plan for addressing land management in Caribbean SIDS; Implementation of Community based land management projects in Caribbean SIDS; The establishment of modalities for South-South Cooperation.

37. Technical assistance to facilitate the implementation of the initiative to support Caribbean small island developing States in meeting their obligations under the United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa and the land management component of the Barbados Programme of Action. The Partnership on Sustainable Land Management (PISLM) is having a significant impact on the way the Caribbean SIDS approach land management.

38. The Talamanca-Caribbean Biological Corridor, located between Cuba, the Dominican Republic and Haiti, will provide the framework for the rehabilitation of degraded land and ecosystems in Haiti, among others. Outputs so far attained include: The establishment of a framework for the protection of biodiversity through environmental rehabilitation, particularly in Haiti and the alleviation of poverty as a means of reducing the pressure on biological resources; Demarcation of the Caribbean Biological Corridor; Strengthening the Network of Protected Areas for the Island of Hispaniola; Rehabilitation of degraded Area and the Identification and Implementation of Livelihood Alternatives for Communities; Human Resources Development.

39. The 10-year integrated management programme on transforming Dominica into an environmentally sound organic island will use the country's natural resources – water, forest, biodiversity and productive agriculture – as the basis for the country's transformation. It is expected that the main impact of this project will be the establishment of Dominica as an environmentally sound organic island. The project has great potential to have transformational impacts, if the necessary resources are invested to facilitate the necessary changes.

G. Energy resources

40. A project on the generation and delivery of renewable energy-based modern energy services will establish commercial business models for renewable technologies providing modern energy services on Isla de la Juventud, Cuba, for replication to other small islands both in the Caribbean and elsewhere.

41. Technical assistance to facilitate renewable energy initiatives in the Caribbean small island developing States in the areas of biofuels aims to focus particular attention on biomass derived from the sugar industry but not excluding other types of biomass.

42. A project on solar and wind energy resource assessment aims at facilitating investment in large-scale use of solar and wind energy technologies with tools for analysis and use of resource information, regional/national solar and wind resource maps, and national assessment demonstrations.

43. The Caribbean Hotel Energy Action Programme (CHENACT) has as its objective to develop the Caribbean Hotel Energy Efficiency Action Programme, explore the possibilities of obtaining carbon credits through the Clean Development Mechanism (CDM), promote the compliance with the Montreal Protocol (phasing out of ozone depleting substances) and achieve eligibility for the Climate Investment Fund (CIF) funding. The Programme will contribute to the efficient use of energy resources in the tourism industry across the Caribbean. Ultimately, it will translate in positive environmental impacts from the reduction of greenhouse gas emissions and phasing out of ODS. It will also have positive economic impacts such as the decline of the tourism industry energy bill and additional revenue streams from carbon finance transactions under the new PCDM. The adoption of standardized EE practices will make the tourism industry more competitive through lower charges in the energy bill, which as stated before is a significant portion of hotels' operational costs, and a positive environmental footprint that can be marketed to reach environmentally aware customers. MG will lift some of the pressure on energy generation by introducing the use of RE and diversifying the energy matrix from the side of an important power consumer. The net impact of these measures on the economy will be reflected on the regional energy bill that is highly correlated with oil and gas international prices and fluctuating supply. Current beneficiary SIDS are Barbados, Jamaica, Bahamas, Suriname, Trinidad and Tobago, Belize, Haiti, Dominican Republic and Guyana.

44. Energy is one of the key issues for SIDS – for the most they face the problem with ensuring supply, and particularly renewable energy sources may offer a chance to overcome this. Power from waste could represent an alternative and this would help solve another of the classical SIDS problems –waste handling. Under UNEP's Sustainable Energy Advisory Facility, the project "Development of a Biodiesel Development Strategy for Jamaica" is under development. Jamaica's energy mix remains dependent on the use of imported petroleum based fuel with approximately 94.4 % of imports and 5.6% from indigenous sources. Jamaica's overall fuel imports have been growing at an average annual growth rate of 3% per annum over the past twenty eight years, while the transport sector has experienced an average annual growth rate of 4% per annum. This indicates that transport activity is one of the demand drivers, thereby contributing to the nation's "addiction to oil". The trend in automotive diesel consumption for transport indicates steady growth in diesel demand, of about 7% over the past decade. This growth may be attributed to the 1995 Motor Vehicle Import Policy which revised, expanded and liberalized the importation of motor vehicles; and expansion in the public bus transportation fleet. The objective of the project is to increase the utilization of locally produced biodiesel as a road transport fuel in Jamaica. The expected outputs resulting from the project are: (a) Final drafts of financial incentives and policies for increased biodiesel utilization and production with locally grown

feedstock are prepared; (b) User-friendly guide for cultivation of jathropa and/or other energy crops (as feedstock for biodiesel production) under Jamaican conditions is prepared; (c) Funding (public, private or public/private) is released for implementation of a small-scale pilot biodiesel plant capable of producing 250,000 litres per year; and (d) Biodiesel value-chain development strategy is developed through a participatory process, documented in a final report.

H. Tourism resources

45. A project on mainstreaming biodiversity conservation into tourism through the development and dissemination of best practices will mainstream biodiversity conservation into the tourism industry and secure local, national and global environmental benefits in two among the world's most biodiverse countries, namely, Belize and Ecuador. A methodology guide for tourism management plans has been completed and criteria for sustainable tourism (based on UNEP/CBD guidelines) developed. These tools provide a sound basis for incorporating biodiversity into tourism management plans and to meet target of third party certification. Governments and institution in all three BRs. adopted tourism management plans for all three Biosphere Reserves have been adopted. Furthermore, two of the three BRs (Aggtelek and Sumava) have integrated their TMPs into the regional development plans ready for implementation. Training materials have been developed for the purpose of training tourism operations personnel to incorporate biodiversity best practices in sustainable tourism at demonstration sites. Private sector involvement contributed to the establishment of communication strategies for each project area. First incentive measures (e.g. contests, tourism fairs and exhibitions) have created an enhanced environment for sustainable business engagement. All activities are aimed at improving conservation and sustainable use of the biodiversity of the participating Biosphere reserves. Tracking tools have shown modest improvements in management effectiveness of Biosphere Reserves.

46. A project on demonstrating and capturing best practices and technologies for the reduction of land-sourced impacts resulting from coastal tourism aims to demonstrate best practice strategies for sustainable tourism to reduce the degradation of marine and coastal environments of transboundary significance and to address the negative impacts of tourism on the coastal and marine environment of sub-Saharan Africa, which includes the Seychelles; to promote the development of sustainable tourism policies and strategies; to implement demonstration projects in a number of countries that participated in the African Process; to engage the private sector and enhance public-private partnerships to enable formulation and implementation of appropriate national and regional policies and strategies for sustainable tourism development, including a policy and strategy framework to guide and promote ecotourism development.

47. Project Climate Change Adaptation and Mitigation in the Tourism Sector: Frameworks, practices and tools for coastal destinations and SIDS (see para 7 (e) above).

I. Biodiversity resources

48. Jointly with the secretariat of the Convention on Biological Diversity and the Secretariat of the Pacific Regional Environment Programme, work is under way to promote what is known as the "Island Biodiversity Programme of Work". Examples include the campaign to celebrate Pacific island biodiversity and the production of media reports on island biodiversity to undertake a comprehensive assessment of the current status, issues and trends of biodiversity in the Pacific region.

49. A project on strengthening protected areas in the Wider Caribbean region aims at strengthening the Caribbean MPA Managers Network and Forum through the implementation of a five year Strategic Plan and improving the management of MPAs in the region through Regional Training of Trainers courses for MPA managers, and better practices through assistance from the CaMPAM (Wider Caribbean Marine Protected Area Managers) Small Grants Fund and complementary grants on sustainable fisheries and alternative livelihoods, and tourism practices in Cuba, Jamaica, Dominican Republic, and Barbados; and the finalization of an updated web-based database of the MPAs in the Wider Caribbean. Local training activities took place in the Bahamas, Cuba, Dominican Republic, Grenada, Guadeloupe, and Jamaica, Dominican Republic, Cuba, Panama, Colombia and Haiti.

50. A project on guidelines for protected areas and species management will produce guidelines and criteria for the listing of protected areas under the Protocol –under the Cartagena Convention for the Wider Caribbean- Concerning Specially Protected Areas and Wildlife (SPAW) and the compilation of a preliminary list of protected areas under that Protocol to initiate a regional network and cooperation between the areas. A project on the conservation of threatened and endangered species will implement the priority actions of the regional action plan for marine mammals for the wider Caribbean region; update the regional manatee management plan for the region; support the development of sea turtle conservation and recovery priority actions; build capacity for the management of the conch and lobster fisheries.

51. The project “Conservation of Threatened and Endangered Species” includes the implementation of priority actions of the Regional Action Plan for Marine Mammals (MMAP) for the Wider Caribbean Region; updating of the Regional Manatee Management Plan for the region; support to the development of sea turtle conservation and recovery priority actions in e.g. Barbados; and various capacity-building activities. So far under the project MMAP and Manatee plans have been endorsed, priority actions as per MMAP Sea Turtle Recovery Plans have been finalized, and Management plans for Conch have been developed.

52. The project on conservation and sustainable use of coastal and marine ecosystems, including International Coral Reef Initiative activities, builds on the experiences in Mesoamerica from the International Coral Reef Action Network Mesoamerican Reef Alliance Project and will further strengthen capacity in sustainable marine recreation practices and environmental performance assessments, while forming alliances with local businesses, marine protected area managers and local communities. This will include small grants and training workshops in collaboration with CORAL in the Dominican Republic, to further advance implementation of locally developed marine recreation standards, and promote stakeholder dialogue for improved coastal and marine tourism practices. As part of this project best practices have been developed and disseminated in the Wider Caribbean Region, there is an increased collaboration between actors, strengthened capacity for the sustainable use of marine resources.

53. Through the project “Enhancing synergetic implementation of biodiversity related Multilateral Environmental Agreements (MEAs)” the development of National MEA Implementation Plans by Selected Countries in Latin America and the Caribbean is being supported. (See para 62 below).

54. The project being implemented in the Dominican Republic and Jamaica, on sustainable conservation of globally important Caribbean bird habitats with a view to strengthening a regional network for a shared resource, aims to enhance the conservation status of globally important sites for biodiversity in the Caribbean. This is being done by strengthening local and national partnerships and increasing awareness of Caribbean biodiversity and the issues affecting it among public and private sector local, national and international stakeholders and decision-makers. In so doing, the project will document globally important biodiversity sites and establish a framework within which information gaps are evaluated and conservation requirements are assessed, advocated and acted upon for the highest priorities. The project has achieved significant results and impact, with some excellent and important products, and in some areas has leveraged actions that went beyond the scope of the project. Overall, the Immediate Objectives have been largely achieved, some publications are still to be released.

Notable project successes include: identification of Important Bird Areas (IBAs) in the Bahamas, Dominican Republic and Jamaica, with associated databases and IBA site accounts; a Regional IBA Directory (publication date late 2008) and IBA database accessible through the BirdLife website; establishment of Site Support Groups (SSGs) at 7 of the 8 project sites; some excellent regional- and national-level publications, including the Birds Caribbean newsletter; very significant raising of co-financing for a MSP (over twice that originally anticipated at project outset), and including significant funding from the corporate sector in the Bahamas; a major contribution to a successful advocacy campaign to halt bauxite mining within the Cockpit Country IBA; small-scale ecotourism ventures around one of the project sites in the Dominican Republic; successful workshops in media communication and strategic and financial planning; some success in promoting the adoption of the IBA programme within government in Jamaica (through the Department of Forestry), the Dominican Republic (Ministry of Environment and Natural Resources) and within the BNT’s strategic plan in the Bahamas; and the bulk of the activities for 6 of the 8 project sites were achieved.

55. A project to support the assessment of capacity-building needs and country-specific priorities in the conservation of biodiversity and participation in the national clearing-house mechanism will assist in identifying the capacity-building needs and country-specific priorities in the conservation of biodiversity and establish a national workable clearing-house mechanism. The project is initially being implemented in Barbados.

56. Project on support to the implementation of national biosafety frameworks, according to the Cartagena Convention on Biosafet, is assisting Mauritius, Madagascar and Seychelles, ensuring an adequate level of protection in the safe transfer, handling and use of living modified organisms resulting from modern biotechnology.

The Project in Mauritius has made considerable progress in terms of achieving the first immediate objective of developing a fully responsive and functional regulatory regime as a key ingredient for the implementation of the other targeted activities. In line with the agreed plan of action a draft national policy paper on biosafety and a draft regulation to the GMO Act 2004 has been prepared together with potential list of consultants to facilitate other activities which critically depends on the regulatory regime for capacity building activities. Two workshops on implementation of the national legislation and Public awareness were rescheduled to allow for the main texts of the regulation to be approved so that it can be used as part of the national training materials. In addition in line with the expected work in GMO Detection, the designated laboratory was retrofitted to allow for treatment of effluents before discharge into the main sewage system of the Food Technology Laboratories, changing/wash rooms were also fitted in the laboratory. The Biotechnology/Biosafety Policy was not part of the GEF approved project but based on stakeholder inputs at the inception workshop, this component was highlighted for support by Government to update the existing Biotechnology Strategy of 1992 to address biosafety policy issues.

Support for the Implementation of National Biosafety Framework of Mauritius Lessons learnt and good practices

- a) Creating the opportunity for oversight through the leadership role of the legally instituted National Biosafety Committee in the project coordination mechanism has been useful in ensuring national ownership and sustainability beyond the project. It also addressed the potential conflicts in mandate which would have arisen in decision if a different National Project Steering Committee was set up. Periodic self evaluation of the project achievements between the National Coordinating committee, the NEA and the project management team and the UNEP Task Manager is a useful management approach to ensure effective in achieving expected results.
- b) Involvement of several national partners in the execution of the project has the positive effect of wider outreach, national ownership and the likelihood replication beyond the project cycle
- c) Emphasising the importance of incremental co-financing and leveraging of associated financing as a way of ensuring financial sustainability has facilitated the contribution of the national government. The Mauritian Government with the support of IFAD put up a Food Technology Laboratory which is also housing the National GMO Detection Laboratory. UNEP is providing equipment specifically for GMO Detection and technical support in the setting up and delivery of capacity in handling GMOs. In addition, the Government of Mauritius is on its own supporting the National Plant Quarantine Service to set up a Multi purpose Plant Quarantine Facility to the tune of \$1 million for assessment of all plant introductions including GMOs. UNEP is providing technical guidance on the biosafety issues. This partnership approach can be replicated in other interventions related to the Implementation of the Cartagena Protocol on Biosafety.

Special constraints and challenges faced

The key constraints have been the fact that the National Biosafety Framework is a regulatory instrument to implement the Cartagena Protocol on Biosafety for which a lot of the expertise in Mauritius are either within the biotechnology sector or dispersed across several institutes outside the designated institutions targeted to regulate such activities. This is not peculiar to Mauritius. The approach of UNEP and the project team have been to use ad hoc team bringing a group experts across several institutions and where necessary supplemented by International Consultants and the technical support of UNEP to maximize knowledge and institutional capacity

The second challenge is the continuous movement of staff out of the country. This therefore calls for development of sustainability plans and incentive mechanisms to ensure uptake of capacity building efforts beyond the project

Recent trends and emerging issues

The emerging issues is to focus on a biosecurity approach which would combine GMO and Invasive Alien Species Regulatory processes as two distinct regulatory pathways but through a coordinated approach based on the risk analysis principle across several sectors. The other issue is to look at possible Indian Ocean Island multi country activity using this approach under UNEP and co executed by the Indian Ocean Commission and the Countries. The other issue is for a more proactive capacity building support from UNEP on Biosafety as it was the UN Agency which took the leadership in the negotiation and implementation of the Cartagena Protocol on Biosafety and the development of the UNEP Technical Guidelines on Safety in Biotechnology and which also hosts the Secretariat

57. A project on mitigating the threats of invasive alien species in the insular Caribbean aims at the mitigation of the threats to biodiversity and the local economy of invasive alien species in the insular Caribbean. Beneficiary countries are the Dominican Republic, Jamaica, Saint Lucia, Trinidad and Tobago, and the Bahamas. The Global Environment Facility and the Pacific Alliance for Sustainability, in conjunction with the South Pacific Regional

Environment Programme, are working on the joint development of an initiative on the management of invasive species, which aims at reducing the environmental and economic impacts of invasive alien species in both terrestrial and marine habitats in the Pacific.

58. The integrated assessment of trade-related policies on biological diversity in the agricultural sector in selected SIDS in Africa, the Caribbean and the Pacific is intended to develop policy recommendations that safeguard biological diversity while maximizing sustainable development gains from trade liberalization in the agriculture sector. (See para 57 below).

59. UNEP participates in the Global Island Partnership (GLISPA), which assists islands in tackling one of the world's greatest challenges: (a) To conserve and use sustainably the invaluable island natural resources that support people, cultures, and livelihoods in their island homes around the world; (b) To mobilize leadership, increase resources and share skills, knowledge, technologies and innovations in a cost-effective and sustainable way that will catalyze action for conservation and sustainable livelihoods; (c) Engage agencies and organizations worldwide in high-level commitments and on-the-ground action for island conservation and sustainable use, improved exchange of information and collaboration between islands, and between islands and other international entities in support of the MSI.

J. Transportation and Communication

60. In this field UNEP has supported Madagascar and Mauritius to participate at the Southern Africa subregional workshop on Better Air Quality in Cities held in March 2008; and Cape Verde to attend the West and Central Africa subregional Workshop on Better Air Quality in Cities held in July 2009.

Pirates in the Indian Ocean

During the south east Monsoon-April to October the sea is so rough that the pirates are scared to venture out but they represent a big problem during the north-west monsoon when the sea is calm. Many ships have had to recruit armed personnel to deter piracy but the problem does pose major problems for ships and trade for islands in the Indian Ocean. To date the supply of food and other items have not much been impacted upon but things may change and cost of insurance may make the cost of goods and foodstuff prohibitive in the future. The outlook is very scary. The USA and the European Union have placed warships and planes stationed in strategic locations and are conducting patrols.

K. Science and technology

61. One way UNEP is working towards sustainable urban environments and water use is through promoting Environmentally Sound Technologies (ESTs). UNEP's International Environmental Technology Centre (IETC), in partnership with the UNEP Caribbean Regional Co-ordinating Unit, continued the implementation of a project to address the need for improving access to water and wastewater provision in rural communities in environmentally vulnerable areas in Jamaica. The project seeks to analyze local conditions of water and wastewater provision in a number of ecologically sensitive rural areas in Jamaica, and to identify potential provision options that are environmentally sound and manageable by communities. The project is being implemented in partnership with Rural Water Supply of Jamaica. Several interventions for environmentally sound water provision, including improvements in rainwater harvesting and disinfection, have been identified. Pilot-scale implementation of selected ESTs is ongoing at a rural community called Breadnut Walk. Results from pilot implementation are expected to generate data required for larger-scale interventions in Jamaica, as well as other Small Island Developing States.

62. Regional Network in Marine Science and Technology for the Caribbean: the Know-why Network project seeks to implement the protocol concerning pollution from land-based sources and activities to the Cartagena Convention, in particular, the obligations on monitoring and assessment and development of information systems and reporting. The specific objectives are to update existing information of all point and non-point sources of pollution into the Cartagena Convention area through additional scientific analysis; to enhance the capacity of the communication, education, training and awareness subprogramme of the Caribbean Environment Programme by developing the pollution information module; and to enhance countries capacity for using other technologies, such as remote sensing and mapping of pollution data and information. So far marine water quality indicators have been approved, a Regional Activity Network (RAN) and laboratories have been strengthened, and marine and coastal water quality monitoring of selected hotspots has taken place.

L. Trade

63. The project on integrated assessment of trade-related policies and biodiversity in the agricultural sector is supporting, both financially and technically, beneficiary countries to assess the economic, social

and environmental impacts of trade-related policies in the agricultural sector, with particular focus on biodiversity impacts. This initiative aims to enhance capacity in selected African, Caribbean and Pacific SIDS to develop policy recommendations that safeguard biological diversity while maximizing sustainable development gains from trade liberalization in the agriculture sector. The project in Jamaica focuses on the impacts of reforms of the EU-ACP Sugar Protocol as part of the EU-ACP Economic Partnership Agreement negotiations (loss of trade preferences). The project in Papua New Guinea focuses on the impacts of trade liberalisation measures (particularly tariff reduction) affecting major export crops (e.g. coffee and oil palm) on two major staple food crops (taro and sweet potato). In Mauritius the project focuses on the impacts of reforms of the EU-ACP Sugar Protocol as part of the EU-ACP Economic Partnership Agreement negotiations (loss of trade preferences). As impacts of this projects it is to be mentioned a) Capacities built in national research institutes and government ministries in integrated and biodiversity assessment and identifying economic, social, environmental and biodiversity impacts of trade policies; b) Initiation of process to incorporate biodiversity impacts into formulation and implementation of trade policies.

64. Support to biotrade in the Dominican Republic is provided to promote sustainable biotrade practices in selected rural communities living on the Dominican Republic–Haiti border, contributing to the improvement of their life quality and poverty alleviation through sustainable entrepreneurial activities.

65. UNEP-UNCTAD Capacity Building Task Force on Trade, Environment and Development: More than 150 participants from 27 SIDS countries benefited from the activities of the UNEP-UNCTAD Capacity Building Task Force on Trade, Environment and Development (CBTF) between 2005-2009. Most of them participated in regional capacity building activities, mainly focused on broad range of Trade and Environment issues including EGS negotiations at the WTO and MEA-WTO relationship.

Case study: Disaster Risk Reduction in Coastal Tourism Destinations

From 2006 to 2008, UNEP worked with a number of partners to help build capacity for disaster risk reduction in three tsunami-hit tourist destinations. The project entitled “*Disaster Reduction through Awareness, Preparedness and Prevention Mechanisms in Coastal Settlements in Asia: Demonstration in Tourism Destinations*” aimed at increasing the disaster management operational capacity of the main disaster and tourism stakeholders in these tsunami-affected tourism destinations. The intervention actions in the demonstration destinations address various priorities identified by the Barbados Programme of Action and have the potential for replication across the region and in other SIDS regions.

The demonstration project used UNEP’s Awareness and Preparedness for Emergencies at the Local Level (APELL) process. APELL proved to be very successful to create public awareness of hazards and to ensure that communities and emergency services are adequately trained and prepared to respond to disasters operating through the formation of local stakeholders.

The main project results included the increased disaster management operational capacity of local partners and beneficiaries, amongst other, due to more than 150 local people trained with case studies on key elements for disaster prevention, and more than 180 local people educated on the APELL. Cooperation and coordination between the local authorities and the tourism sector, and between local and national authorities was enhanced through activities such as setting-up coordination groups involving all stakeholders and support of national institutions allowing long-term sustainability of project results and continuity at the local level.

The key success factors identified for the project were the involvement of all stakeholders, the establishment of local coordination groups, expertise and international/ national support, the management structure and local project leaders, as well as effective financial management.

A toolkit available at UNEP’s website was produced to allow replication of this successful project in other destinations. The project was funded by the European Union through the EU-Asia Pro Eco II B Post-Tsunami Programme.

Case study: Trade policy assessments and biodiversity in Mauritius

Between 2007 and 2009, with support from UNEP’s Trade and Biodiversity Initiative, the Ministry of Agro-Industry, Food Production and Security in Mauritius in collaboration with the Agricultural Research and Extension Unit (AREU) undertook an Integrated Assessment of the economic, social and environmental impacts of the dismantling of the EU-ACP Sugar Protocol, focusing specifically on the Multi-Annual Adaptation Strategy (MAAS Action Plan 2006-2015). The project was successful in creating a better understanding of the impacts of national and international trade policies on the local biodiversity and natural resources. Through the project, the country had the opportunity to gain experience in undertaking an integrated assessment, identifying biodiversity challenges and opportunities and adjusting tools and techniques to country specific context, as well as to establish a process for stakeholder consultation and relevant institutional partnerships in the area of trade, agriculture and biodiversity for the future. The study’s findings indicate

that the implementation of the MAAS policy will affect the rural livelihoods due to factory closure, right-sizing of labour force and closure of the Bulk Sugar Terminal. The study highlighted areas with significant social, economic and environmental impacts, which need further attention for the mid-term review and further implementation of the MAAS, including the regrouping of small and medium-size cane growers into intensive monoculture system of cultivation and the gradual abandonment of the some 5000 ha of marginal land situated in difficult areas along the mountain slopes. Based on the recommendations of the study, the Ministry of Agro-Industry, Food Production and Security increased its efforts to hold high-level consultation on the regrouping of farmers, develop land-use plans for difficult areas likely to be abandoned, train farmers on good management practises, as well as to increase capacity on valuation of biodiversity. Further training programmes have been initiated at national level with the aim to disseminate the integrated assessment and planning approach to other sectors and policy processes.

M. Sustainable capacity development and education for sustainable development

66. Environmental education and awareness activities include:

- (a) Curricula review at the secondary level with the objective of recommending additional modules and resources, in particular on curriculum enhancement at the secondary level, in support of the UN Decade of Education for Sustainable Development, 2005-14. This exercise is being conducted in five Pacific island countries, namely, Fiji, Kiribati, Samoa, Tonga and Vanuatu.
- (b) In cooperation with the University of the South Pacific and the Pacific Youth Environment Network, UNEP organized a future leaders forum in April 2007, which was intended to empower young leaders with information and knowledge;¹
- (c) In cooperation with the Pacific Youth Environment Network, UNEP is preparing a youth and sustainability toolkit, which is a training toolkit for the future leaders forum to be used for training and capacity-building purposes within the Pacific small island developing States. It is expected to be widely distributed by South Pacific Regional Environment Programme.

67. Human resource development initiatives intended to strengthen human resources in the Pacific region on conservation issues include:

- (a) Co-funding of scholarships for the second phase of the Pacific islands community conservation course with University of the South Pacific;
- (b) Applied research and attachment programmes;
- (c) Development of a conservation project management toolkit;
- (d) UNEP/Tongji Leadership Programme on Environment for Sustainable Development
- (e) Masters scholarship at the Asian Institute of Technology.

68. A pilot project is under way for the development of integrated legislation with a view to the incorporation into domestic law in countries of the Pacific of the chemicals conventions, namely, the Stockholm Convention on Persistent Organic Pollutants, the Basel Conventions on the Transboundary Movement of Hazardous Wastes, the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade and the Waigani Convention to Ban the Importation into Forum Island Countries of Hazardous and Radioactive Wastes and to Control the Transboundary Movement and Management of Hazardous Wastes within the South Pacific Region. Beneficiary SIDS include Fiji, Vanuatu, Solomon Islands, Papua New Guinea, Samoa, Tonga, Tuvalu, Kiribati, Federated States of Micronesia, Marshall Islands, Palau, Cook Islands. Guiding elements for review of the existing legislation and the preparation of new legislation drafted for the Government of Tonga, which resulted in a bill submitted to its parliament.

69. The project on enhancing synergetic implementation of biodiversity-related multilateral environmental agreements (MEAs) through the development of national multilateral environmental agreement implementation plans by selected countries in Latin America and the Caribbean is aimed at enhancing the national strategies and national action plans for the implementation of biodiversity-related multilateral environmental agreements by providing assistance through the development of national implementation plans for the effective implementation of a cluster of key biodiversity related MEAs.

70. An initiative to organize preparatory meetings for climate change negotiators from the Alliance of Small Island States is aimed at assisting member countries of the Alliance which are parties to the Framework Convention on Climate Change to articulate their national and regional policy positions with regard to the specific building blocks of the Bali Roadmap. (See para 7 (f) above).

¹ In the preamble to the Mauritius Strategy, small island developing States recognize the integral role of youth in sustainable development and the need to ensure their participation in programmes and activities related to the sustainable development of small island developing States.

71. Phase II of the UNEP Organization of Eastern Caribbean States model harmonized biodiversity legislation project aims at building on the work of phase I, which included the drafting of model harmonized biodiversity legislation for the nine countries of the Organization. Phase II is aimed at developing model biodiversity legislation in three selected Organization countries.
72. The European Community programme on capacity-building related to multilateral environmental agreements in African, Caribbean and Pacific countries is a capacity-building project supported by UNEP to build the capacity of African, Caribbean and Pacific small island developing States to implement their respective obligations under multilateral environmental agreements and honour related commitments, thereby resulting in sound management of the environment and natural resources. It is expected that this will lead towards poverty alleviation and sustainable development with a focus on, among others, mitigating the adverse effects of climate change, loss of biodiversity, drought, land degradation, chemicals, hazardous wastes and other threats to the environment. Activities generally focus on strengthening and enhancing the capacities of national governments and stakeholders, and include negotiation and lobbying skills training; project design and management training; harmonizing and streamlining of national reporting to MEA; and improved information management and utilization.
73. A Quick Start Programme trust fund established to support activities to enable initial capacity-building and implementation of the Strategic Approach to International Chemicals Management continues to give priority to the urgent needs of least developed countries and small island developing States. Since the Fund became operational in late 2006, the inter-agency trust fund implementation committee has, as of September 2009, approved projects for 15 small island developing State. The projects address the three Programme strategic priorities: developing or updating of national chemicals profiles; building on the work of chemicals-related international agreements and initiatives; and mainstreaming chemicals management in national development planning. The majority of projects are still at the early stage of their implementation, with exception of the Sao Tome & Principe and Haiti projects, in which the activities have been completed and in Comoros which has advanced toward the completion of its project.
74. The project on capacity development in geographic information systems for the land-based sources regional activity centre at the Centre for Engineering and Environmental Management of Bays and Coasts (*Centro de Ingeniería y Manejo Ambiental de Bahías y Costas – CIMAB*) in Cuba aimed to (a) develop the institutional capabilities of the centre in the use of geographic information systems; including a well established GIS computing environment; (b) train a base of technicians and professionals in the development of GIS database and GIS use of information; (c) make GIS products available for dissemination and demonstration; (d) produce metadata catalogue of archived and new data and information, and; (e) increase the number and variety of services offered by LBS/RAC-CIMAB to CEP and member countries.
75. Training courses on the drafting of model environmental legislation for the Caribbean small island developing States and implementation of environmental treaties, finalised in 2008, were intended to support legislative drafting on environmental issues. The courses were implemented in partnership with the Faculty of Law of the University of the West Indies.
76. A project on expedited financing for interim capacity-building measures in priority areas is being implemented in Comoros as an interim capacity-building activity for the period between the initial and the second national communications to the Framework Convention on Climate Change. It complements the activities of the phase 1 project, related to the initial communication, while forming the basis for initiation of the second national communication.
77. A project on national capacity self-assessment for global environmental management aims to identify country-level priorities and needs for capacity-building to address global environmental issues, in particular biological diversity, climate change, and land degradation, and the synergies between them, with the aim of catalysing domestic or externally assisted action to meet those needs in a coordinated and planned manner. Beneficiary SIDS are Saint. Lucia, Cuba, Haiti, Vanuatu and Trinidad and Tobago.
78. The project “National Capacity Self-Assessment (NCSA) for Global Environmental Management for Barbados” is conducting an assessment of the national capacity to assist in protecting the global environment by effectively implementing the Rio Conventions, specifically the Framework Convention on Climate Change (UNFCCC), the Convention on Biological Diversity (UNCBD) and the Convention to Combat Drought and Desertification (UNCCD). It will also contribute to the implementation of the broader National Sustainable Development Policy.
79. Four academics from two SIDS, i.e., Mauritius and Seychelles, underwent training in two international training programmes on mainstreaming environment and sustainability in African university partnerships. The main objective of the training course was to provide an opportunity to exchange knowledge and experiences in environment and sustainable development in the higher education sector and deepen understanding of the environmental, socio-cultural and economic dynamics of sustainable development. Two training programmes were

conducted, i.e., a three week exchange programme in Sweden and a two week workshop in Rhodes University, South Africa.

80. University professors from Madagascar and Seychelles participated in the First Mainstreaming Environment and Sustainability in African Universities (MESA) International Conference with the theme Environment, Development and Climate Change in Africa: Universities Responding?, organised by UNEP and held in Nairobi in November 2008.

81. Other environmental education and training activities in small island developing States include:

(a) Supporting the Faculty of Engineering at the University of Mauritius in researching sustainable technologies for composting paper waste and for providing more sustainable energy resources for Mauritius. This is part of a broader eco-campus initiative that involves the development of a general environmental management module for all students, an environmental awareness campaign for students and staff and a community engagement component;

(b) Supporting the establishment of the University of Seychelles through a core module on the sustainable development of small island States, which includes issues such as climate change, management of ecosystem services, sustainable fisheries management and biodiversity and tourism.

(c) Capacity Building for Judges in Biodiversity related issues, jointly implemented with ELI (Environmental Law Institute) in Jamaica and the Dominican Republic. Relevant training materials are being developed.

(d) In partnership with the University of West Indies a project for the improvement of Access to Environmental Justice in the Caribbean is being implemented. Under the project the establishment and consolidation of an Expert Group on Access to Environmental Justice, including Judges, Prosecutors, General attorneys, legal officers and legal NGOs, will take place. Experiences and lessons learnt will be exchanged and common challenges towards improvement of access to environmental justice identified.

N. Sustainable production and consumption

82. Mauritius has been selected by UNEP as one of the pilot countries for the development of a national programme and action plan on sustainable consumption and production. A memorandum of understanding was signed between UNEP and the Ministry of Environment in May 2007 for the elaboration of the programme by July 2008. The national programme on sustainable consumption and production for Mauritius is currently being finalized and the implementation phase started.

83. The establishment of a regional information Centre on Cleaner Production and Sustainable Consumption for the Caribbean will support better access and availability of information on sustainable consumption and production.

84. UNEP supported the organization of regional meetings on sustainable consumption and production (SCP): (a) First SCP Meeting for Caribbean Countries, as part of the sub-regional activities done in LAC in the framework of the Regional Council of Government Experts on SCP and the LAC Forum of Ministers of Environment. This included country members of the Caribbean Community (CARICOM). The sub-regional SCP action plan was revised and Recommendations were made to the Ministers to enhance the activities on SCP in the sub-region. (b) First Training workshop on sustainable public procurement for Central America, including Cuba, Dominican Republic and Belize. An important outcome is that procurement officers and SCP focal points got better information and resources to promote the issue at national level.

O. National and regional enabling environments²

85. The Third Conference of the Pacific Youth and Environment Network took place in early 2009 at the University of the South Pacific in Suva. It is the annual network meeting of the Pacific Youth under the UNEP Global Tunza Strategy. The Conference was organized by the UNEP Regional Office for Asia and the Pacific, in partnership with the University of the South Pacific.

86. The Asia-Pacific civil society meeting on international environmental governance included an Asia-Pacific civil society statement for inputs to the Global Civil Society Forum. It was held in parallel with the twenty-fifth session of the UNEP Governing Council/Global Ministerial Environment Forum in Nairobi in February 2009, and organised by the UNEP Regional Office for Asia and the Pacific with support from the European Union..

² This thematic area of the Mauritius Strategy refers also to governance and in this sense it is linked to the UNEP medium-term strategy 2010–2013 relevant subprogramme.

87. UNEP, through its Regional Office for LAC, provided advisory services and co-organised the CARICOM's Council for Trade and Economic Development (COTED) [Environment] to support follow up to the COTED meeting held in April 2008 and to contribute to environmental policy formulation in the Caribbean Community.

88. Support was provided by UNEP to the Government of Suriname in the preparation of proposals for cooperation to assist the Government in formulating an environmental action plan for the country.

89. Under the aegis of the Forum of Ministers of Environment of Latin America and the Caribbean, to which UNEP LAC Regional Office is the Secretariat, an Expert Group on Environmental Indicators for SIDS has been established. The activity is as an expansion of the Indicators Project to selected Caribbean SIDS on the Latin American and Caribbean Initiative for Sustainable Development (ILAC), adopted by the Forum of Ministers and endorsed by the Johannesburg Plan of Implementation. The main objective of the group will be to monitor the implementation of ILAC.

90. The implementation of the "Micronesia challenge" project, on sustainable finance systems for island protected area management, aims at the development and application of sustainable finance systems and policies that will provide sustainable long-term core resources for effective and adaptive conservation strategies across the three country proponents of the Micronesia Challenge, namely, Federated States of Micronesia, Palau and Marshall Islands.

91. As part of the implementation of UNDP-UNEP Poverty and Environment Initiative (PEI), aimed at providing financial and technical support in order to assist countries to mainstream environmental management into poverty reduction strategies, budgeting processes and national development plans, UNEP is supporting the Dominican Republic and Haiti. The PEI impacts countries by promoting good environmental management, which results in increased well-being and livelihoods, poverty reduction, and contributes to economic growth.

P. Knowledge management and information for decision-making

92. The *Mauritius Environment Outlook* report was produced making use of the UNEP/GEO Networks. It presents the state and trends of the environment, outlook and scenarios and policy options of the country within the framework of the implementation of the Africa Environment Information Network to build countries' capacity to establish essential data foundation and information for decision-making.

93. Promotion and utilization of Global Environment Outlook (UNEP/GEO) tools and processes in the Pacific through the Secretariat of the Pacific Regional Environment Programme (SPREP) participation in the "Assessment of assessments" exercise, conducted within the framework of the United Nations General Assembly (resolution A/60/30) on the regular process for global reporting and assessment of the state of the marine environment including social and economic aspects.

94. Capacity development for integrated environmental assessment is being undertaken, in partnership with SPREP and the University of the South Pacific, in Papua New Guinea and Kiribati with emphasis on the generation of meaningful information for decision-making and the maximizing of policy impacts of environmental assessment and reporting.

95. With the aim of furthering cooperation on capacity-building in the South Pacific subregion, and in line with the Bali Strategic Plan, UNEP and the South Pacific Regional Environment Programme are considering, subject to the availability of resources, the implementation of the following activities:

(a) Capacity-building in integrated environmental assessment for the South Pacific to produce a South Pacific Environment Outlook report. The assessment will focus on climate change impacts and adaptation and will complement and aim to support national and regional actions set out in the 2009 programme of work of the South Pacific Regional Environment Programme, particularly under component 2.3 on environmental governance, and the action plan for the implementation of the Pacific islands framework for action on climate change 2006–2015;

(b) Training courses to build the capacity of governmental and scientific institutions in mapping vulnerability to climate change and ecosystem change and risk reduction at the national and regional levels as a basis for adaptation planning, financing and cost-effective preventive actions. Beneficiary countries will be small island developing States in the South Pacific and Indian Ocean. This activity is to be implemented together with the integrated environmental assessments capacity-building described above.

96. Integrated Environmental Assessments (IEA) for the Caribbean:

(a) The "GEO Youth Caribbean", which is the IEA of the Caribbean undertaken by Youth using the GEO for youth approach was completed in November 2008. Active participation of more than 150 young people in fourteen

different Caribbean countries took place. Training of young sustainable leaders on how to elaborate IEA was carried out. There was a sub-regional launch in Grenada followed by national launches in most participative countries, which were covered by the media. The fact also promoted increased connection between Caribbean countries' Environment Ministries and Environmental Youth Groups.

(b) Report "Climate Change in the Caribbean and the Challenge of Adaptation". (See para 7 (b) above).

(c) The publication "ILAC Cuba" is being finalised as a report on the indicators of sustainable development for Cuba. This is part of the follow up to the Initiative for the Sustainable Development of Latin America and the Caribbean (ILAC) –adopted by the Forum of Ministers of Latin America and the Caribbean and endorsed in the Johannesburg Plan of Implementation.

(d) Integrated environmental assessments for Belize, Cuba, Haiti and the Dominican Republic using the Global Environment Outlook conceptual framework are under preparation.

(e) Integrated environmental assessments are also under completion for cities such as Georgetown and Santo Domingo, using the Global Environment Outlook for Cities approach.

(f) Urban environmental profiles of three cities in Cuba (Santa Clara, Holguín and Cienfuegos), using the Global Environment Outlook approach, were finalized in 2008.

97. UNEP supported SPREP to participate in the 8th Annual Collaborative Assessment Network (CAN) meeting and National Sustainable Development Strategies (NSDS) workshop in Bangkok in late 2008 and associated follow up activities. Specific objectives were to promote networking of UNEP's partner institutions in the Asia Pacific region, and to facilitate consolidated delivery on priority regional issues and initiatives.

98. The international waters learning exchange and resource network "IW:LEARN" was established by UNEP to test the effectiveness of cross-focal area networking among a regional cluster of current and future GEF-funded projects in the wider Caribbean region to promote the integration of efforts, synergies, identification of gaps, conflicts and opportunities and support information resources to facilitate networking, knowledge-sharing and facilitated dialogue among the regional cluster of GEF-funded projects in the Wider Caribbean.

99. UNEP supported the organisation of the Regional Meeting: Developing a Strategy for the Management of Data and Information for the Caribbean Regional Coordinating Unit Sub-programme on Assessment and Management of Environment Pollution (AMEP), (Havana, Cuba, 2007), where the information management Strategy for the AMEP sub-programme was drafted in consultation with the LBS Regional Activity Centres, and ongoing collaborative partners and short, medium and long term actions identified.

100. The participation of Mauritius and Madagascar in the Southern Africa regional workshop on Better Air Quality in Cities was supported by UNEP in 2008. The main outcome of the workshop was the Lusaka Agreement (2008) - Southern African Development Community (SADC) Regional Policy Framework on Air Pollution. The framework outlines actions to be taken in key areas to reduce air pollution in the region leading to sustainable development and the avoidance of the socio-economic costs of air pollution impacts on the people and the environment. These areas cover multilateral cooperation; transport; industry; open burning; indoor air pollution; national environmental governance; public awareness; and research, development and capacity building.

101. In cooperation with the Indian Ocean Commission, UNEP/DEPI Marine Branch is promoting the SIDS AIMS region website in initial countries (*Mauritius, Seychelles, Comoros and Madagascar*) and establishing focal point collaborators, formats for standard material (project and programme development, technical specifications, country profile data), with hyperlinks to technical information, news and comment to ensure its sustainability. The project will build upon the work and materials developed by the Clearinghouse Mechanism of the Nairobi Convention. One of the activities under the initiative is to conduct a regional workshop in late 2009 to launch the website and conduct training for the national focal points and the contributors. The expected outputs are a network of trained contributors established for continuous upgrading of the website, and recommendations to continue improving and using the website.

102. Preparation of "Water vulnerability to Environmental Change in the Pacific" report using scientifically credible information to support sound policy making on integrated water resource management at subregional and national levels, with special attention to the needs of achieving relevant Millennium Development Goals (MDGs),

Q. South-South cooperation

103. South-South cooperation between Caribbean small island developing States and Latin American countries is being used as an instrument for sharing experiences and transferring technologies in support of the attainment of the goals outlined in the Barbados Programme of Action and the Mauritius Strategy. This modality of cooperation is currently taking place within the context of the UNEP Caribbean small island developing States programme in the areas of renewable energy technologies, land degradation, water resources with special emphasis on

the management of coastal aquifers, biosafety, trade and environment, climate change and disaster management. To oversee this South-South cooperation, the Forum of Ministers of Environment of Latin America and the Caribbean, for which the UNEP Regional Office for Latin America and the Caribbean (ROLAC) is the Secretariat, has established a ministerial support group chaired by the Government of Chile. ROLAC has also held a series of consultations with the Ministers of Environment of Cuba, the Dominican Republic and Haiti to explore the possibility of establishing South-South cooperation mechanisms that would support the three SIDS' capacity-building projects in common priority areas.