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Integrated review of the thematic cluster of energy for sustainable development, industrial development, air pollution/atmosphere and climate change in small island developing States

Report of the Secretary-General

Summary

The present report reviews the status of progress in small island developing States in the implementation of the Mauritius Strategy for the Further Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States, with specific focus on energy for sustainable development, industrial development, air pollution/atmosphere and climate change. The report was prepared in fulfilment of the mandate of the Commission on Sustainable Development at its thirteenth session, by which a special one-day session will be convened by the Commission at its fourteenth session to consider progress towards the sustainable development of small island developing States, within the framework of the thematic cluster under review by the Commission.

The report also describes the challenges small island developing States face in their efforts to advance implementation of the Mauritius Strategy.

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I. Introduction

1. At its thirteenth session, in April 2005, the Commission on Sustainable Development decided that it would devote one day of the review sessions of the Commission to consider implementation of the Mauritius Strategy for the Further Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States, focusing on that year's thematic cluster, as well as on any new developments regarding the sustainable development efforts of small island developing States, using existing modalities.[1] The present review is conducted pursuant to the decision to consider small island developing States-related cross-cutting issues at each session of the Commission.

2. The present report is prepared in response to the request made by the Commission at its thirteenth session for the Secretary-General to submit to the Commission at its review session a report concerning progress and obstacles in respect of sustainable development in small island developing States and making recommendations on enhancing its implementation. During preparation of a comprehensive update in respect of the thematic cluster, the linkages among energy for sustainable development in small island developing States, industrial development, air pollution and climate change were highlighted to demonstrate the inherent vulnerability of the said islands States.

3. The report presents the continuing needs by small island developing States of support for their efforts to implement the Programme of Action for the Sustainable Development of Small Island Developing States, the Plan of Implementation of the World Summit on Sustainable Development and the Mauritius Strategy for the Further Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States in respect of this cluster of issues as well as major regional and international support for those efforts. A summary of the continuing challenges that small island developing States must face in relation to this thematic cluster is also presented as a basis for consideration of the next steps to be taken.

4. Data used to prepare the present report were taken from diverse publications and periodic reports issued by organizations and bodies of the United Nations system, as well as regional and national assessment reports of small island developing States. The dependence on secondary data due to extremely limited primary data sources demonstrates the weak, often non-existent infrastructure for data collection in small island developing States. Indeed, the absence of reliable systems for measuring and monitoring progress represents a major challenge to the limited human and institutional capacity of small island developing States.

II. Linkages in the thematic cluster

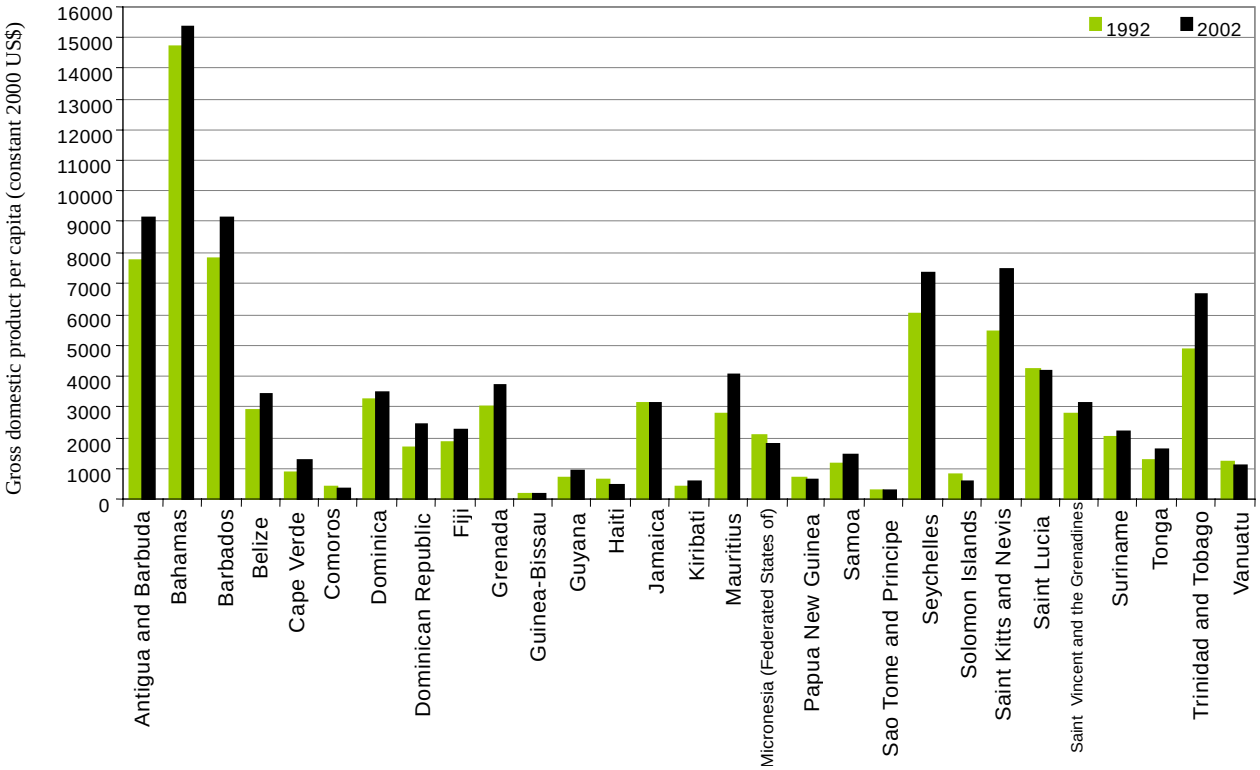
5. The issues of energy, industrial development, atmospheric pollution and climate change being considered in the current cycle of the Commission on Sustainable Development are particularly relevant to small island developing States, since it is in that cluster of issues that some of the most significant factors that contribute to the economic, social and environmental vulnerabilities of those States are found. The vulnerability of small island developing States is seen in their

inherent inability to adjust to external or internal, natural or man-made shocks because of physical and structural constraints.

6. Most small island developing States are remote, small in land area and population (less than 1.5 million), with a very narrow resource base and fragile land and marine ecosystems that are highly exposed to extreme natural disasters; their economies are open and heavily dependent on trade for national income. Many face high transportation and communication costs and have difficulty benefiting from economies of scale without access to export markets; with a few notable exceptions, most have limited human, institutional and financial capacity and face ever-increasing demographic and economic pressure on existing natural resources and ecosystems.

7. As figure 1 illustrates, small island developing States vary considerably in levels of per capita income. Nonetheless, several of them face the challenges typical of many developing countries: poverty and socio-economic inequalities within the population; significant external indebtedness with declining receipts from official development assistance; and increased competition for foreign direct investment. As a result, the mobilization of resources for public investment in infrastructure and social welfare has been challenging for some States. The increase in gross domestic product (GDP) per capita achieved by several (see figure 1) belies these structural challenges and internal inequities.

Figure 1
Gross domestic product per capita



Source: World Development Indicators (2005).

8. It is from this perspective that the interlinkages among the cluster of issues to be considered at the fourteenth session of the Commission are relevant. The present review of efforts by small island developing States to improve their access to and affordability of energy services for their populations and to promote industrial development will include consideration of the dependence of many States on fossil fuel imports for energy, and will address their initiatives in the development and use of renewable energy sources. The overall assessment of industrial development will take into account the impact of such development on sustainable development. The report will also assess progress in the promotion of competitive industries and how the air pollution problems of small island developing States are addressed, notably through promoting greater transport efficiency. The status of implementation of adaptation measures for climate change is also presented in the framework of wider efforts aimed at strengthening vulnerability assessment and monitoring.

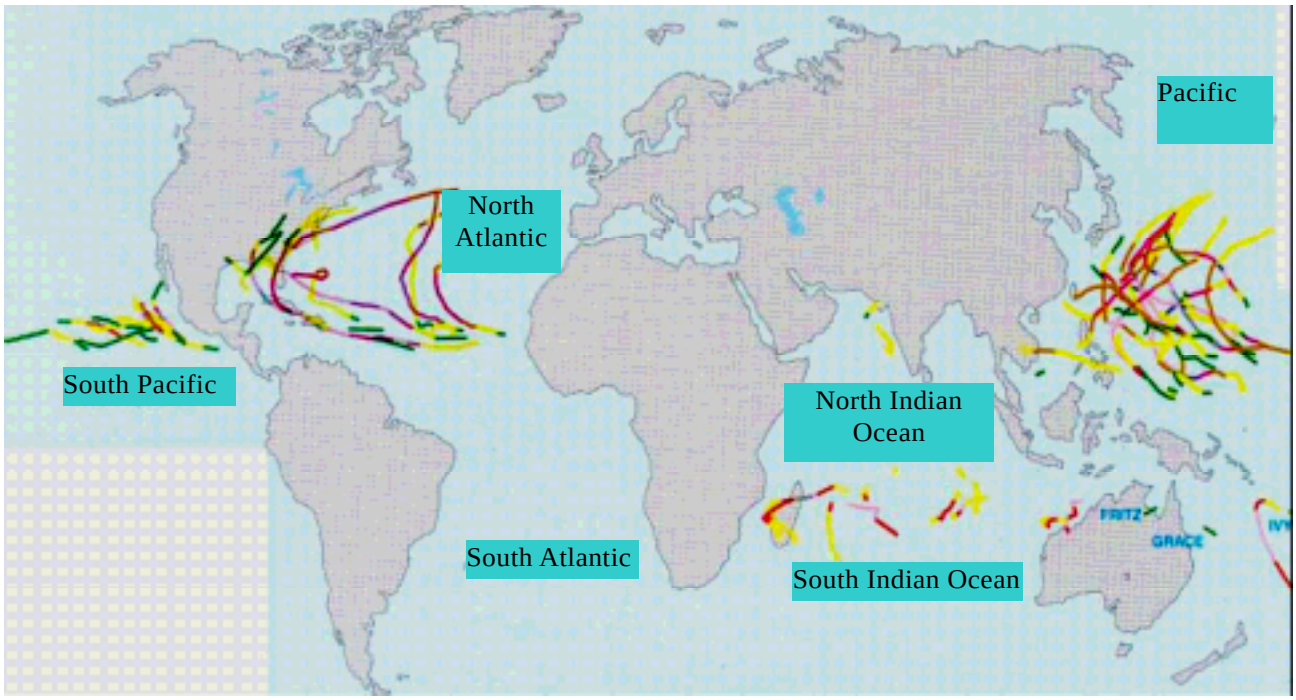
III. Vulnerability to natural disasters

9. The exposure of many small island developing States to natural disasters has significant economic, social and environmental consequences. In 2004 and 2005 for example, the Caribbean region saw an unprecedented number of hurricanes and storms. Figure 2 illustrates tropical storm and hurricane activity in 2004. That year, a single event, hurricane Ivan, did significant damage to Grenada, displaced hundreds of thousands of the population of at least seven Caribbean small island developing States, and caused more than US$ 111 million in damage in Jamaica alone.[2] Figure 3 shows the costs from the damage caused by natural disasters in the Caribbean basin over the past decade.

10. Beyond displacement of the population, such events also undermine the industries on which many economies of small island developing States are built. Chief among these are agricultural industries and tourism. Many States have suffered significant crop losses because of extreme weather events. Furthermore, because coastal tourism predominates in many small island developing States, hurricanes and tsunamis cause enormous damage to industry infrastructure, while rising sea levels and temperatures from climate change result in coral bleaching and coastal erosion, also degrading tourism-related natural assets.

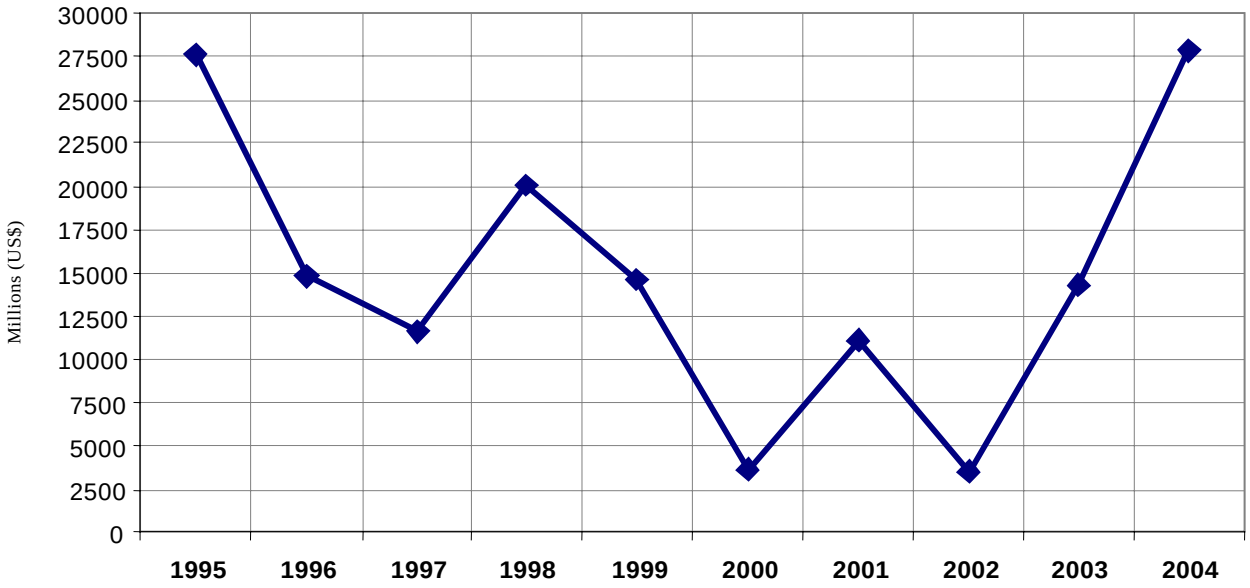
11. In some cases, notably the Maldives, Kiribati, Tuvalu and the Marshall Islands, coastal inundation (even total submersion) is increasingly a very real threat, as is the risk of saltwater intrusion into groundwater systems in low-lying atolls, endangering already scarce freshwater resources. The situation is further exacerbated by the pollution of coastal waters due to poor waste management in overburdened municipalities, heavy siltation and pesticide pollution from agricultural run-off, the result of poor agricultural practices, watershed degradation and deforestation in rural hillside communities for the purposes of housing, subsistence farming and fuel.

Figure 2
Tropical storm and hurricane activity in 2004



Source: Adapted from UNEP, *Pacific Environment Outlook 2005*.

Figure 3
Cost of natural disasters in the Caribbean basin



Note: Data cover entire Caribbean basin, including small island developing States and mainland.
Source: International Federation of Red Cross and Red Crescent Societies, *World Disasters Report 2005*.

Box 1
The Grenada experience

Hurricane Ivan was a category 4 system with sustained winds exceeding 140 miles per hour when it reached Grenada on 7 December 2004. In a single day, 28 people were killed and 90 per cent of the island's housing stock (representing 38 per cent of GDP) damaged. This included 90 per cent damage or destruction of hotel rooms, totalling EC$ 288 million (29 per cent of GDP), and damage to hospitals, schools, electricity installations and telecommunication facilities, with a combined value of 42 per cent of GDP.

Substantial damage was caused to ecotourism and cultural heritage sites accounting for 60 per cent job losses in that subsector, while the nutmeg and cocoa industries, which contributed 10 per cent of GDP, will require between six and eight years to recover before they can again contribute GDP and foreign exchange earnings.

Overall damage was estimated at EC$ 2.2 billion, twice the value of the island's total GDP. Following Ivan's passage in 2004, Grenada's economic growth forecast shrank from 5.7 per cent to -1.4 per cent.

The island had scarcely embarked on its road to recovery when it was hit by hurricane Emily on 14 July 2005, causing damage estimated at EC$ 140 million, or 12.9 per cent of GDP, and displacing 38 per cent of the population.

Source: OECS, 2004.

12. The interdependence of the challenges that the cluster of issues poses for small island developing States underscores the importance of an integrated approach that accounts for their vulnerabilities. Small island developing States could devise more effective resilience-building strategies: for example, with the application of innovative alternative energy technology, sewage could be converted to methane and fertilizer, addressing at once waste disposal and alternate energy generation, with a dividend for agricultural production. The success of such initiatives, however, will depend on the political support for their development and access to financial and technical resources for the development of appropriate technology.

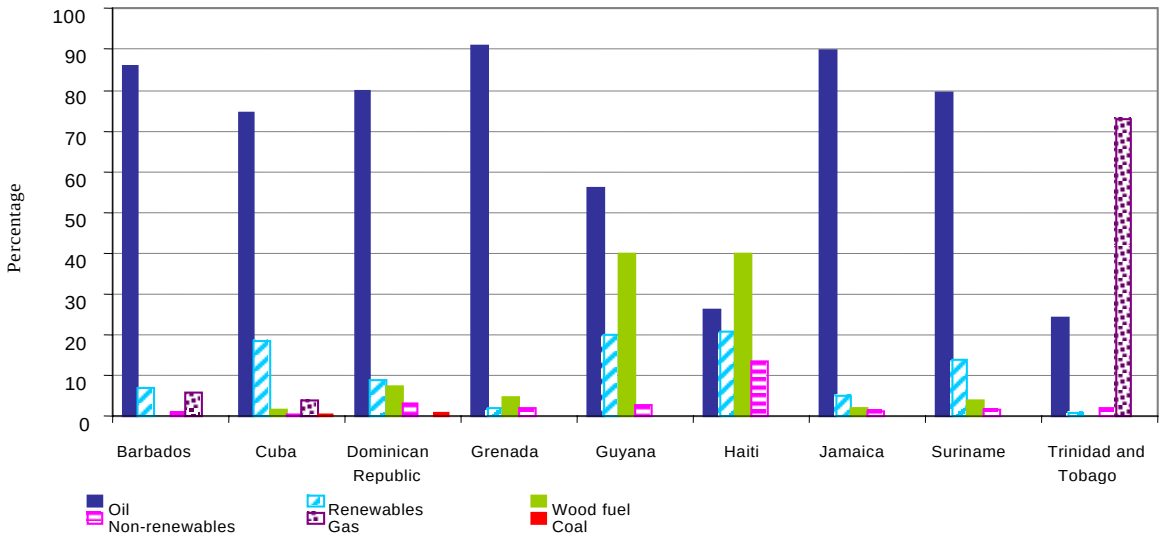
IV. Energy for poverty reduction and sustainable development

13. With few exceptions, most small island developing States are highly dependent on imported fossil fuels for energy. As they have continued to develop, their demand for fossil fuels has also increased, in particular for electricity production. Considering their distance from markets and metropolitan centres as well as the multi-island characteristic of many States, transportation remains crucial to their development. Transport is thus the fastest growing consumer of oil, with fuel needs for transport to remote islands especially high.

14. Some poor communities in certain small island developing States continue to use traditional energy sources. In Haiti, for example, 60 per cent of energy is sourced from charcoal and fuelwood.[3] This practice not only has a negative effect on the fragile ecosystems on which the major industries in small island developing States depend, but also contributes to air pollution.

15. Dependence on oil imports, however, is what places the greatest strain on many small island developing States, particularly in the event of steep rises in oil prices. On average, more than 90 per cent of energy is sourced from oil imports, which account for the largest percentage of foreign exchange earnings of small island developing States. Figure 4 illustrates the distribution of energy sources in a select group of Caribbean States. Oil will remain the most important commercial energy source for most States for the foreseeable future, despite efforts to develop alternative energy sources. High fuel transport costs to remote islands add significantly to energy costs: for example, because of their remoteness, the landed price of oil products in many Pacific small island developing States is typically 200 to 300 per cent higher than average international prices. The energy-cost disincentive for foreign investment contributes to undermining competitiveness. High energy costs also contribute to price inflation of all domestic goods and services, including transportation and food, with a direct negative effect on the socio-economic well-being of the population, particularly the poor. The situation demands strategies for improved efficiency in energy consumption and investment in locally produced alternative energy sources. These efforts have proved challenging for heavily indebted, income-poor States.

Figure 4
Caribbean energy supply



Note: Renewables = charcoal + cane + hydro; wood fuel = sustainable wood fuel for household, industry and agriculture; non-renewables = non-sustainable wood fuel + other non-renewables (excluding fossil fuels).
Source: ECLAC, *Renewable Energy Sources in Latin America and the Caribbean; situation and policy proposals* (2004).

A. Providing access to affordable energy services to the poor

16. Small island developing States enjoy varying degrees of access to energy resources. It is estimated that in Pacific island countries, approximately 70 per cent of the population has no access to modern energy services, with many living in remote islands or rural areas. Because of this very large gap in coverage, meeting the basic energy requirements and sustainable socio-economic development needs of peoples with subsistence incomes remains a priority, particularly in the Pacific. In the Atlantic, the Indian Ocean, Mediterranean and South China Sea and the Caribbean region, where electricity and other energy distribution networks reach much of the population, affordability of energy services remains a major problem for the poor.

17. For many small island developing States, access to energy is linked to reliability of supply. This is a particular challenge for the archipelagic or multi-island States, as well as for those with remote inland or isolated coastal areas. Most rural communities tend to use smaller diesel generator units that are less efficient than larger ones, particularly when they are run intermittently. This is often the case in small communities, where resources to pay for imported fuel are limited. In such circumstances, energy is used only when absolutely necessary, inevitably in an inefficient manner.

18. Access and affordability are closely linked, and in many cases have implications for the development of small-scale renewable energy applications. The Marshall Islands, for example, has developed a project for outer island electrification which would utilize small-scale photovoltaic technology as well as biomass digesters and coconut oil as a diesel substitute in small generators. It is proposed that the cost of implementation be shared among the Government, a local private utility corporation and an international donor. If successful in promoting access to energy in an affordable manner for the outer islands communities, it would represent an excellent example of partnership in energy management for sustainable development for remote, poor communities in many small island developing States.

19. There has also been research on smaller scale digester systems in Jamaica and in the Cook Islands that could be utilized in rural areas and in remote islands to improve energy efficiency while utilizing waste materials. Such initiatives are part of a set of measures to build resilience in small island developing States.

B. Promoting the development and use of renewable energy

20. More extensive use of renewable energy in small island developing States would significantly contribute towards reducing their vulnerability and building their resilience. While there is much potential for the further development of renewable energy sources in those States, the share of renewables in total energy supply remains small. This may be attributed in some cases to a lack of information and local technical and institutional capacity in renewable energy technologies, the absence of policies to promote their research and development, and, most significantly, inadequate financing and investment opportunities for their development, whether from private entrepreneurs or through international support.

21. A number of ongoing initiatives, however, demonstrate the commitment of some small island developing States to expanding their own renewable energy

sources. The Caribbean Renewable Energy Development Project focuses on renewable energy as a means of reducing dependence on fossil fuels, through promotion of biomass, cogeneration, geothermal energy, landfill gas and wind-grid integration. This innovative regional project promotes renewable energy while mitigating the risk to investors in renewable energy projects, by addressing the economic, transaction-cost and revenue risks. Niue recently signed an agreement with Greenpeace to develop a 100 per cent renewable energy programme for the island using primarily wind power and biomass.

22. Small island developing States have a relatively constant supply of solar energy. Direct solar energy is currently used in many of them for heating water, and to some extent in the Caribbean for crop drying and processing. Effective application of fiscal incentives in Barbados resulted in the significant expansion of use of solar water heaters. The use of small-scale solar photovoltaic power to provide electricity in rural areas and remote islands with isolated pockets of low-load densities also appears to have been successful in some States, though more work on financing and institutional arrangements is required to effectively promote further commercialization.

23. The production of cleaner alternative energy sources, such as biofuel from sugar cane, coconuts or other biomass products, is being researched and pursued. Their use would also assist in combating land degradation, as they could be planted on degraded or unused land (particularly the high yielding varieties of short rotation species), or restore coconut groves. The emerging biofuels policy in Fiji will promote planting on degraded lands, reducing net emissions of greenhouse gases.

24. Ambient air quality would be improved by using more ethanol-gasoline and coconut-diesel blends. Use of ethanol is being explored in a number of small island developing States, including Jamaica and the Dominican Republic. There are also examples of simple improvements in technologies and techniques which have yielded greater profitability for renewable sources (such as biomass). In the Cook Islands, for example, the switch from a copra-production to a cold-press method for processing coconut milk has resulted in a more efficient, cleaner production of oil.

25. There are many practical examples of functioning biomass systems in certain States. The conversion of buses in Vanuatu and tugboats in the Marshall Islands to run on coconut oil instead of diesel was largely the result of research by independent entrepreneurs who sought a solution for rising fuel prices and a dwindling market for coconut oil. Although traditional biomass fuel usage in small island developing States is both inefficient and unsustainable, biomass energy offers enormous potential for renewable energy technology applications. Comprehensive technical feasibility assessments for geothermal and wind energy are still to be undertaken.

26. Hydropower resources for electricity production are extensive only in a few islands (for example in Fiji, Jamaica, the Solomon Islands, Samoa and Vanuatu), though many island countries have mini hydropower capacity of a few megawatts.

27. Since the management and disposal of wastes is a major concern for small island developing States, waste-to-energy or biogas systems are being given serious consideration for their role in converting organic wastes into sustainable energy and organic fertilizer.

28. A more efficient dissemination of information on renewable energy technologies and practices in small island developing States would promote wider

knowledge of existing possibilities in alternative energy development. There is also a need for technical advice and training to carry out cost-benefit analyses to ensure that the particular choice of renewable energy gives an optimum return to the economy.

Box 2
A regional assessment of renewable energy potential in the Pacific

A regional assessment of renewable energy potential in the Pacific estimates total potential energy from hydro, solar and other renewable sources could reach 365,349 kilowatt hours, equivalent to half of Fiji's power consumption in 2004. If a medium-sized home in the Pacific consumes 100 to 250 kilowatt hours of electricity, approximately 120,000 homes can be serviced by 365,349 kilowatt hours. With a standard diesel plant conversion of 0.25 litre per kWr, small island developing States can save 90 million litres of diesel, or US$ 60 million. The South Pacific Regional Environment Programme/United Nations Development Programme audit shows that Fiji can produce 11,000 kilowatts of electricity from agriculture, 3,000 kilowatts of electricity from forestry and 125 kilowatts of electricity from biofuel. For wind power, Fiji has the potential to produce 75 kWh, compared to the current production of 1 kWr (as at 2003).

Along with Papua New Guinea, five other small island developing States have the potential to exploit hydropower: Fiji (over 90,185 kilowatts of electricity), Samoa (11,060), Federated States of Micronesia (2,060), Vanuatu (600) and the Solomon Islands (455). Solar energy holds much promise for Fiji, the Cook Islands and Tonga, each with the potential to produce 3,000, 2,000 and 1,000 kilowatts of electricity respectively.

Cost and maintenance are major factors hampering the wider use of renewable energy in the Pacific. Other obstacles include institutional, financial and market factors, lack of awareness and capacity, technical, policy and regulatory issues. Small island developing States will seek to address these issues through targeted projects, and will also initiate cost analyses, which would show the savings each country would make.

Source: South Pacific Regional Environment Programme, 2006.

C. Promoting energy efficiency in key areas of industrial development

29. Many small island developing States have been relatively slow to adopt energy efficiency practices and designs, mainly due to lack of appropriate policy, information, awareness and education, and a general reluctance by consumers and energy suppliers to make the initial investment required to achieve future savings.

30. More efficient energy systems help reduce costs, the volume and costs of imported fossil fuels, while improving local air quality and reducing the emission of greenhouse gases. In Jamaica, a national energy fund designed to assist with the

financing of energy efficiency programmes is currently under consideration. Other measures undertaken by Jamaica to promote energy efficiency include the reduction or abolition of customs duty on imported energy-efficient technologies, and the reduction of consumption taxes on energy-efficient equipment. The lack of skilled personnel in the area of power system analysis, design and in effective operation and maintenance procedures has limited the ability of power utilities in some small island developing States to address energy efficiencies, particularly in the power generating system.

31. The equipment used in electricity generation also contributes to inefficiency in power production and distribution as a result of inadequacies in procurement specifications. The opportunities for efficiency gains are therefore numerous, as shown by the analysis contained in a number of national communications submitted to the United Nations Framework Convention on Climate Change by regional organizations of certain small island developing States and by agencies of the United Nations system.

32. Grenada reported that it was developing a comprehensive policy to address energy demand and supply for both residences and industry, looking at energy audits for all levels of energy production and use, and introducing incentives for renewable energy and energy-efficient applications. Seychelles reported that the options being considered included heat recovery from the public electricity generating plants; promotion of renewable energy technologies and energy-efficient appliances in the energy end-use sector; and supply-side management, including the reduction in electricity losses. On the demand side, Seychelles proposes to establish an energy efficiency and renewable energy office that would assist with information and energy audits.

V. Towards sustainable industrial development

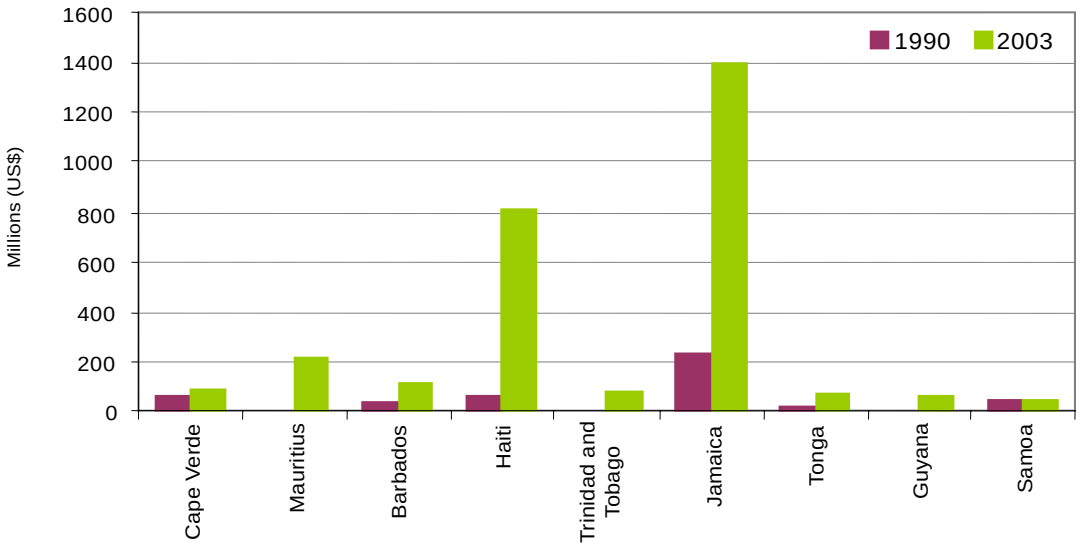
A. Industrial development and poverty eradication

33. For many small island developing States, their small size has been an obstacle to efficiency and competitiveness in the development of their indigenous industries. Many have a narrow range of mostly primary products to trade, many of which are subject to price fluctuation and long-term relative price declines. While some States have been successfully pursuing efforts to diversify into such areas as financial services and a few have oil and mineral resources, many others depend for most of their export income on a combination of single-crop agricultural industry, fisheries and tourism. With trade liberalization, these open economies have been substantially affected by external economic competition and the loss of preferential trading arrangements on traditional commodity exports, notably sugar and bananas.

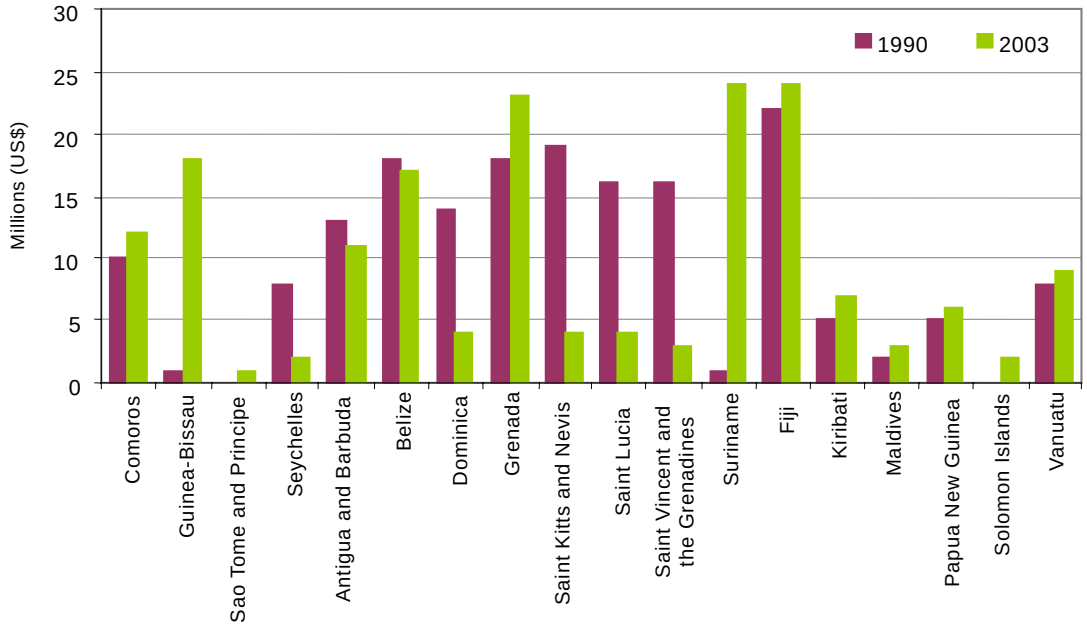
34. For many States, in addition to increased income flows from remittances (see figure 5), the tourism sector has become an important contributor to national income and foreign exchange earnings. Figure 6 shows the increase in tourist arrivals in a select group of small island developing States. The tourism industry has however not been able to compensate for the decline in employment among the rural poor that has resulted from the demise of important agricultural industries, which were the largest single employers of manual labour.

Figure 5
Workers remittances and compensation of employees

A. Countries with higher worker remittances and compensation of employees



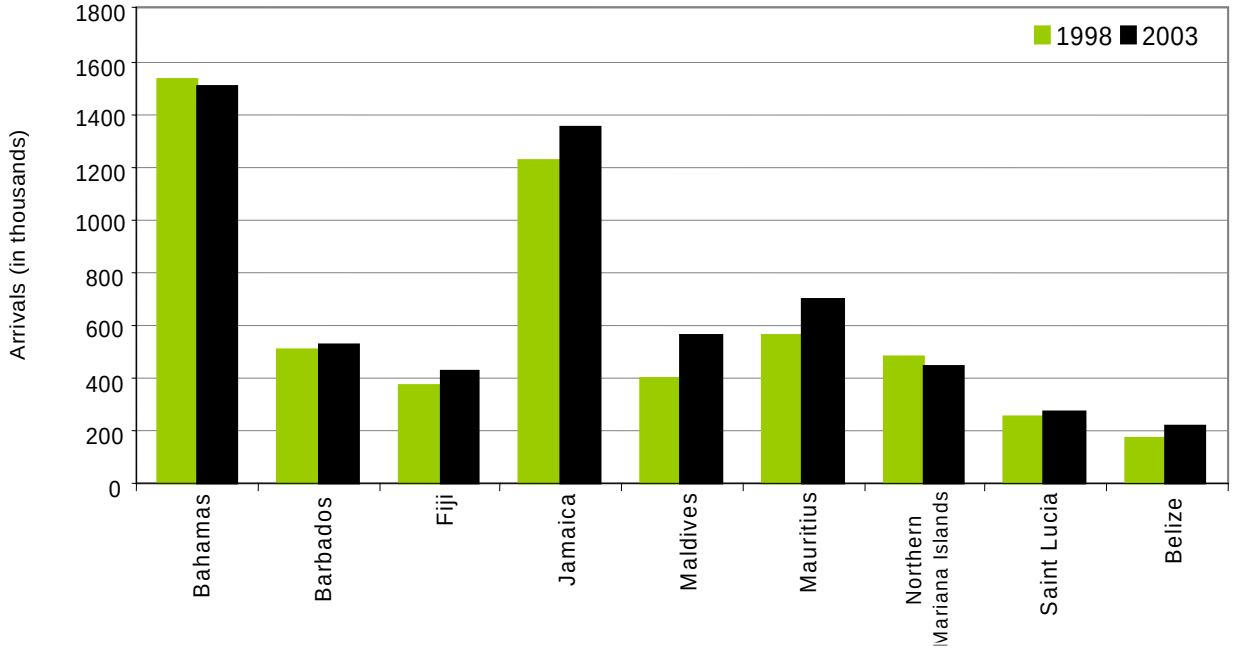
B. Countries with lower worker remittances and compensation of employees



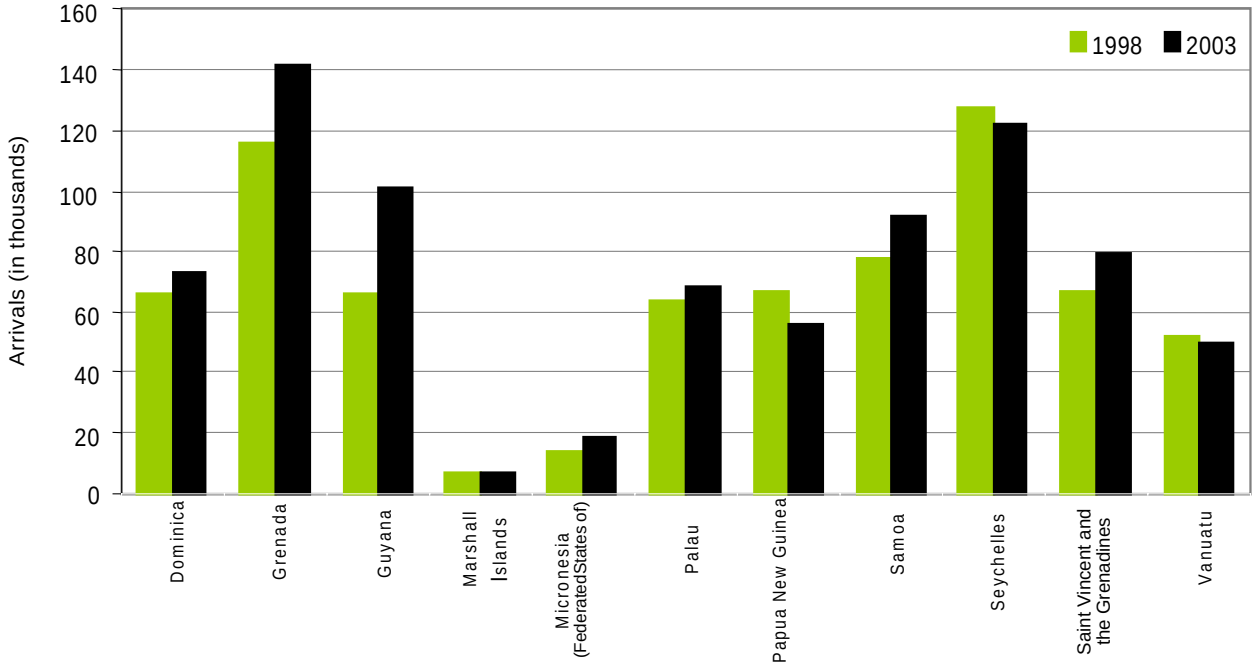
Source: World Bank, *World Development Index, 2005*.

Figure 6
Tourism arrivals

A. Countries with highest tourism arrivals



B. Countries with lowest tourism arrivals



Source: World Bank, *World Development Index, 2005*.

35. The decline of agriculture and related processing industries has directly contributed to increased levels of poverty and economic displacement in many rural communities, resulting in a rural to urban drift, with attendant strain on municipal services and socio-economic support for growing urban populations.

36. The small island developing States of the Atlantic, the Indian Ocean, the Mediterranean and South China Sea have few natural mineral resources and little fertile land for agriculture and forestry. The main resources for most are their coastlines for tourism and marine areas for commercial fishing. In Seychelles, for example, coastal tourism contributes between 46 and 50 per cent of GDP, 70 per cent of foreign exchange earnings and employs 20 per cent of the population. Fisheries and canned tuna are the other main sources of export earnings. Export of tuna constituted 77 per cent of Maldives total marine product exports in 2003. In the Comoros, agriculture employs almost 80 per cent of the population and generates 38 per cent of GDP.

37. The more developed States such as Mauritius and Seychelles, have promoted and established viable secondary and tertiary sectors, including manufacturing and off-shore business and financial services. They have created fresh initiatives in social security and welfare provision and policies on ownership of land, encouraging worker, family and community participation in commercial activity and commercial ownership, with the aim to reduce social dependence and encourage partnership in social and economic progress. They manufacture goods using domestic material inputs under franchise for local markets, reducing dependence on imports and making a wider range of goods available at lower prices for local consumption.

38. Other States, such as the Comoros, Sao Tome and Principe and Guinea-Bissau, face greater challenges to social and economic development. Maldives and Cape Verde face graduation from least developed country status, raising serious concern regarding the expected impact of the loss of benefits derived from concessionary treatment on their economic performance and consequently on the standard of living of their populations. Smooth transition policies are necessary if the economic gains made to date are not to be lost.

39. In the Pacific region, coastal and marine resources underpin the subsistence economies that still characterize many island States. Agriculture remains the single largest sector, employing between 40 and 80 per cent of the population and constituting between 20 and 40 per cent of GDP and over 50 per cent of exports. Subsistence agriculture is still the main source of real income and the main insurance against poverty for the majority of rural communities, and also for many urban residents with rural relatives. The agricultural sector is dominated by diversified small-scale semi-subsistence farm households with a few large commercial plantations. In many countries, root and tree crops still dominate agriculture production. In smaller islands and atolls, agro-forestry and tree crops provide most of the food, medicine, construction materials and other products and services which would be too expensive to import.

40. The role of the manufacturing sector in many Pacific island States is minimal, reflecting a weak industrial base that is restricted mostly to the processing of primary goods, including coconut oil-based products. Some countries, such as Papua

New Guinea, Fiji and the Solomon Islands, rely on large mineral resources for their development. The economic significance of mineral exploitation is reflected in the related export earnings. For example, in Papua New Guinea, the mineral sector accounts for 32 per cent of export earnings, and 30 per cent for those of the Solomon Islands. Training and capacity-building in mineral assessment and earth science are being initiated. However, much of the wealth from mining and tourism does not reach the community level, and service providers in the tourism industry are often employed on low wages.

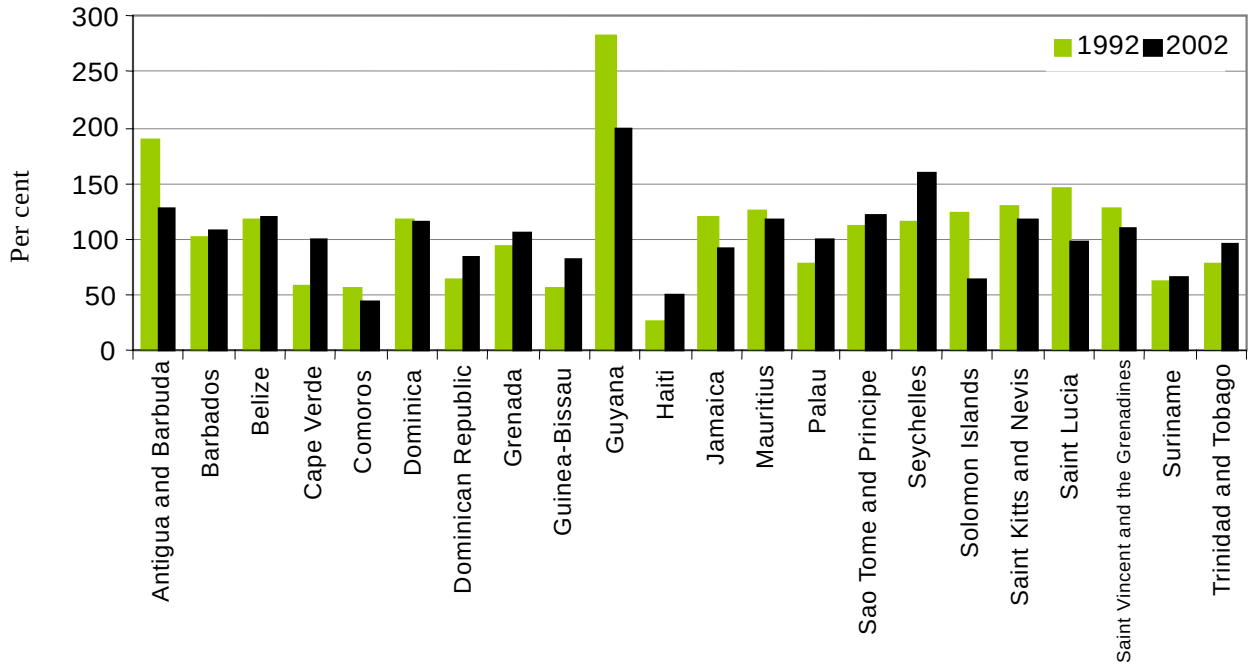
41. The Caribbean States have evolved from a concentration on primary products — mainly specializing in sugar, rice, coffee and bananas, with mineral extraction important in the larger countries — to more service-oriented economies. Tourism is acknowledged as the industry with the greatest growth potential in many States, with financial services becoming increasingly important in a few, such as the Bahamas, Barbados and Jamaica. The services sector in the Caribbean has an average annual growth rate of nearly five per cent. Tourism accounts for the largest share of the services sector. Manufacturing has generally remained small, limited mostly to the processing of agricultural products, minerals and some light industry, with the exception of Trinidad and Tobago, where the industrial sector remains more prominent than in other countries.

42. Despite a number of significant challenges, the Caribbean has continued to see a sustained growth in per capita income, with most countries having achieved middle-income status. However, poverty levels remain high in many countries, such as Haiti and Guyana, while significant pockets of poverty can be found in eastern Caribbean States with high levels of unemployment. Growing unemployment, declining real wages in the agriculture sector and limited employment opportunities underscore the poverty crisis in the rural sector. At the same time, the Caribbean has witnessed the increasing migration of its highly educated and trained work force, contributing to a chronic skills deficit.

B. Promotion of competitive industries

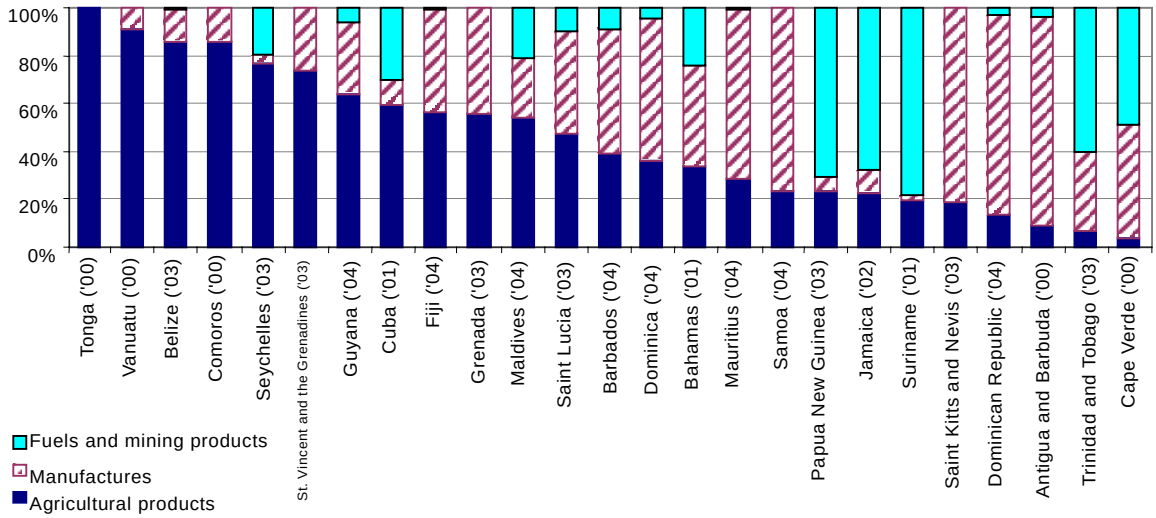
43. Competitiveness is essential for the economic success of small island developing States. Trade is central to their economic development (see figure 7), and holds even greater potential in the right conditions. The impact of globalization and trade liberalization on their economic competitiveness is a major concern for many States. While there may be opportunities for niche market development, the erosion of trade preferences has adversely affected commodity and light manufactured exports, particularly bananas, sugar and textiles. Many States are still heavily dependent on agriculture, which generates a sizeable share of their export earnings (see figure 8).

Figure 7
Trade as a percentage of gross domestic product



Source: World Bank, *World Development Index, 2005.*

Figure 8
Structure of exports in selected small island developing States
(Latest available data)



Source: United Nations Department of Economic and Social Affairs, based on data of the World Tourism Organization.

44. The trade-dependent economies of small island developing States are uniformly turning to services in which they have a competitive advantage. Efforts at economic diversification have focused on tourism, information and communications technology, the development of niche markets and, in the case of the Bahamas, Barbados, Mauritius and Vanuatu, the development of the financial services sector, particularly offshore banking services. Barbados is an example of a Caribbean State that has made the transition from an agricultural to a service-oriented economy through the implementation of institutional and policy measures which have increased productivity and enhanced international price competitiveness. Tuvalu and Niue have been successful in marketing their Internet domain names.

45. Many Pacific island countries, however, have lagged in terms of economic growth and international competitiveness. Constraints to development include unskilled human resources, poor labour productivity, distortions in land and labour markets and a lack of incentives for more dynamic development of the private sector. In addition, the inability to achieve economies of scale has direct bearing on the competitiveness of these countries.

46. Moreover, their narrow resource base and the challenges faced in gaining market access have, in most cases, affected their ability to mobilize savings for investments. In general, action is needed to improve the investment climate through sound fiscal and financial policies and create a conducive environment to encourage the development of capital markets, private domestic activity and foreign and local direct investment.

47. Small island developing States also need to maximize opportunities for diversification into the production of high-quality goods and services for niche markets. Barbados has successfully established a niche market for its rum exports, Fiji for its mineral water and furniture industries. The successful experience of some small island developing States is relevant and applicable to others with similar characteristics. Through enhanced cooperation and partnerships between them, experience can be shared. Consideration is also being given by many States to mainstreaming traditional and informal sectors to optimize their potential contribution to the economy while alleviating poverty.

48. Caribbean small island developing States have also recognized the importance of regional integration as part of an overall strategy for the strengthening of international competitiveness. Through the development of a common market, intraregional trade has boosted exports for a number of countries in the region, particularly Trinidad and Tobago, Jamaica and Barbados.

C. Addressing the sustainable development impact of industrial development

49. The rapid growth of the tourism industry has exacerbated the vulnerability of small island developing States to climate change and rising sea levels by putting great demands on local natural resources. Increased dependence on tourism therefore makes adapting to climate change critical to their sustainable development.

50. Despite improvements in legislative and institutional frameworks and the institution of mandatory requirements for environmental impact assessments for

new tourism investments, many small island developing States still have to surmount considerable difficulties, such as poor infrastructural, technological and human resource capacity, in dealing with the problems of waste management and pollution. Conservation of natural resources and biodiversity is an imperative for the development of the niche market of eco-tourism in many States.

51. Natural resource extraction and transformation for industry and trade have in many cases had a negative impact on the fragile ecosystems of many small island developing States. Land and marine-based sources of pollution have led to increased solid and liquid waste in coastal regions. In agriculture, inorganic fertilizers, herbicides and pesticides are often overused. Mauritius, for example, uses five times more fertilizer for its sugar plantation than the world average of 113 kilograms per hectare, which poses a serious threat to freshwater reservoirs.

52. Land degradation, soil erosion and rapid deforestation are of primary concern to small island developing States. Generally, land is cleared for commercial cultivation and urban or industrial development. The continued deterioration of forests is mainly due to unsustainable patterns of consumption and production. The average annual rate of deforestation over the last five years has approached 2 per cent.

53. Coral reefs face threats from water pollution caused by sewage, pesticides and fertilizers, and have been damaged by certain fishing methods and recreational and tourism activities. Marine ecosystems have been adversely affected by the overfishing of local stocks. While aquaculture has the potential for alleviating pressure on wild stocks, it has a serious environmental impact, such as the clearance of mangroves and other coastal vegetation for ponds, declining water quality caused by nutrient enrichment and oxygen depletion of outflowing water.

VI. Climate change adaptation and air pollution mitigation

54. The adverse effects of climate change and rising sea levels present significant risks to the sustainable development of small island developing States. In its third assessment report, the Intergovernmental Panel on Climate Change noted that the characteristics of small island developing States limit the capacity of small island States to mitigate and adapt to future climate and sea level change. The report also noted that the most significant and immediate consequences for many States would be related to changes in sea level, rainfall, soil-moisture budgets, prevailing winds and short-term variation in wave action patterns at local and regional levels.

55. Small island developing States themselves have identified these issues for priority action in their national communications to the United Nations Framework Convention on Climate Change. It should be noted that only the first national communications, submitted between 1997 and 2003, are available. Second national communications have not been commenced, so information on actual implementation of adaptation options is limited.

A. Strengthening adaptation measures for climate change and rising sea levels

56. Adaptation measures are increasingly acknowledged as crucial to the survival of small island developing States. Some proposals featured in national communications for further consideration as adaptation measures include:

- Management and infrastructure development in agriculture: Mauritius has proposed policies for increased planting, improved irrigation and greater efficiency in anticipation of the effects of climate change;
- Water resources: more efficient management of demand and supply; improved monitoring and forecasting systems for floods and droughts (Seychelles); desalination of sea water (Federated States of Micronesia);
- Human settlement and infrastructure: hazard mapping; improved forecasting and early warning systems; insurance provision (Antigua and Barbuda);
- Public health: development of a health surveillance and forecast system; strengthening of data collection and reporting systems; vaccination campaigns and health education (Saint Kitts and Nevis);
- Tourism: protection of essential facilities and infrastructure as part of an integrated coastal zone management strategy (Barbados, Grenada, Jamaica, Saint Lucia and Singapore);
- Coastal zone: integrated, sustainable coastal zone resource management (Dominica).

57. The above are key areas for adaptation, with examples of possible action. However, limited human, technical and financial capacities have delayed implementation of these activities, and the process for ensuring access to and delivery of international resources is not yet complete.

58. Some small island developing States in the Atlantic, the Indian Ocean, the Mediterranean and the South China Sea have conducted studies on the impact of climate change and rising sea levels on various key socio-economic sectors, and have begun preparation of national adaptation plans or strategies. At the regional level, the Indian Ocean Commission has proposed a three-year programme of work on climate change, focusing on developing guidelines, training for local and national staff, technical expertise development, the establishment of a regional database and country-based awareness programmes.

59. The Caribbean region has also been actively engaged in work on adaptation through the processes established under the United Nations Framework Convention on Climate Change, such as the expert group on technology transfer and in the work on adaptation methodologies. A handbook assessing technological requirements is being prepared to assist States to make informed decisions on adaptation issues in such key sectors as water resources management, agriculture, human health, coastal and marine resources, infrastructure, tourism and biodiversity. The handbook, which is still being finalized, provides a description of the steps to help ensure that assessments are conducted effectively and efficiently.

60. Three types of activity are required: institutional arrangements and stakeholder engagement; descriptions of assessment processes and activities; and implementation.

61. Most small island developing States are beginning a process of assessing adaptation measures and the technologies or expertise required for implementation, following the staged approach endorsed by the Conference of the Parties to the Convention. The approach first investigates vulnerability in all sectors and regions. States have noted the importance of having reliable and detailed information on coastal dynamics and historical data. The example of the construction of the sea wall in Male, Maldives, has shown that there is a need for a full understanding of the ocean and coastal area interaction, since beaches and lagoons are highly dynamic systems, where the interaction of biodiversity with the environment may be sensitive to changes.

62. Stage two of the approach involves planning. In their reports, the Pacific island States have raised the issue of traditional adaptation measures, such as the practice in many Pacific islands of declaring an area "set-aside" or "taboo" for a certain period of time, often resulting in the recovery and regeneration of a depleted area. Maintaining and replenishing mangrove formations can have a highly beneficial effect on the preservation of coastal areas, as demonstrated in Belize.

63. Lastly, in stage three, the measures that have been investigated and planned are implemented. Financial assistance at that stage in the process is crucial if effective implementation is to be assured.

64. National adaptation programmes of action within the United Nations Framework Convention on Climate Change allow the least developed island States to gain access to additional resources for adaptation. To date, however, none have completed their programmes of action.

B. Strengthening vulnerability assessment and monitoring capacity

65. The recently completed Caribbean project on planning for adaptation to climate change, has assisted Caribbean Community States to develop national programmes to address climate change. The design of a regional sea level/climate monitoring network and regional database and information systems, the establishment of national climate committees and the future work of the Caribbean Community climate change centre — to mainstream climate change issues, improve outreach and capacity-building and disseminate information — are the main outcomes of the project.

66. There has been regional support in the Pacific for national efforts to develop strategies and measures on adaptation, technical guidelines and methodologies to facilitate adaptation. There has been a trend towards collaboration to address climate change and variability, such as the annual regional meeting of meteorological directors, which examines ways to plan and prepare for climate and natural variability events, as well as for exchanging information. Vulnerability and assessment training is institutionalized at the University of the South Pacific.

67. In the Atlantic, the Indian Ocean, the Mediterranean and the South China Sea, several challenges remain for effective vulnerability assessment and monitoring. Many of the sea-level monitoring stations installed in the mid-1980s are becoming

obsolete, indeed the network urgently requires upgrading. A major constraint to the implementation of programmes identified in initial national communications and climate change action plans is the lack of both human capacity and funding to conduct related research and reliable assessments. However, some States are working through other initiatives, such as the International Coral Reef Initiative, the Global Climate Observation System and the Agricultural Impact Assessment of Climate Change.

68. Significant efforts have been made by many small island developing States in research to strengthen vulnerability assessments. The University of the West Indies Centre for Environment and Development and the Capacity 2015 programme of the United Nations Development Programme (UNDP) sponsored several meetings of experts in anticipation of the International Meeting to Review the Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States. The meetings addressed the issues of capacity-building for renewable energy and energy efficiency; strategies to enhance resilience, including the role of the private sector, civil society and trade; waste management; capacity-building for sustainable development through training, education and public awareness; opportunities for resilience-building and vulnerability reduction through ocean management; the role of science and technology for sustainable development; strengthening the negotiating capacity of small island developing States; and establishing a consortium of universities from small island developing States.

69. A common feature of the meetings was the focus on resilience-building. Recommendations were addressed from sectoral as well as cross-sectoral perspectives. A UNDP resilience-building facility was established at the Meeting to develop and implement resilience-building programmes in small island developing States. The initiative, which has to date supported work on a Fiji biofuels programme and a similar effort in Cuba, is in need of further financial support.

70. Another important initiative to further assessment and monitoring capacity is the University Consortium of small island developing States. The Consortium was inaugurated at the Meeting in 2005, to support small island developing States through targeted research on resilience-building. Once operational, it is expected that such research will further strengthen the capacity of island States to address crucial issues, including energy and climate change. A funding proposal is currently being developed by the programme coordinator of the Consortium.

C. Promoting transport sector efficiency for the reduction of air pollution

71. In most small island developing States, the transportation sector has been growing steadily, with most reporting an increase in the number of vehicles in use. While lead additives have been phased out in most States, air pollution from older vehicles remains an issue. Furthermore, many States report that the growth in vehicle use due to lifestyle changes has caused congestion on roadways built to accommodate less traffic.

72. In its national communication to the United Nations Framework Convention on Climate Change, Antigua and Barbuda underscored the need to integrate greenhouse gas mitigation objectives with wider societal goals, such as reduced traffic congestion and increased economic productivity. This would integrally

involve the development of a road transportation master plan, with goals for sustainable transportation modes set as part of wider socio-economic planning, and programmes for creating consumer awareness. This is an area where international cooperation is desirable.

73. Mauritius intends to promote the use of biofuels in transportation. Since it is already producing energy from sugar cane bagasse, local expertise exists to ensure diversification into a biofuels industry in the same manner as that planned in Fiji, which has developed the first phases of a biofuels programme.

74. In cases where coconut oil is used as a diesel substitute (mostly in city buses), such as in Vanuatu and the Marshall Islands, the reduction of particulate matter has been significant, as has that of sulphur dioxide, depending on the percentage of diesel retained in the blend.

VII. Means of implementation

75. Small island developing States acknowledge that meaningful development in energy efficiency will be dependent on investment in human and institutional capacity and on their success in gaining access to appropriate technology. Policies being implemented include programmes to increase consumer awareness of conservation and a greater use of alternative energy sources. Much attention has been given to the involvement of civil society and community groups, taking into account the effectiveness of a more participatory approach in ensuring lasting transformation and change.

76. There are also ongoing efforts to involve private entrepreneurs in the development and marketing of renewable energy technologies. In this regard, a range of policy measures to promote and advance research in renewable energy has been undertaken, such as the implementation of laws lowering the duty on components for the development of renewable energy technologies. Attention is being turned to technical and institutional capacity in the study of greenhouse gas data and to undertake relative inventories. The capacity for collecting and analysing long-term climatological data and for developing regional climate models at an appropriate scale for use by small island developing States is being strengthened. Vulnerability and impact assessments and the development of adaptation options are also critical areas for capacity-building and the institutional strengthening currently being pursued by many island States at the national level.

77. Small island developing States have sought to mainstream adaptation strategies and resilience-building measures into existing national development planning. Mobilizing the resources to meet the costs of adaptation, however, remains a challenge. These costs are not negligible: in Jamaica, for example, it is estimated that engineered coastal protection measures alone against a one-metre rise in sea level would cost some US$ 462 million. In Kiribati, it is estimated that if no adaptation measures are undertaken, by 2050 the island State could face economic damages due to climate change and rising sea levels of US$ 8 to $16 million a year, equivalent to 17-34 per cent of its 1998 GDP.[4] Costs would be even higher if, for example, health implications were considered. As a start, a $3.1 million pilot adaptation project is currently being considered by the Global Environment Facility (GEF).

78. While some funding has been made available for capacity-building by GEF resources, most adaptation measures being undertaken in small island developing States have been financed by internal sources. Finding sufficient financing is still the greatest challenge for many island States in their pursuit of adaptation measures and resilience-building.

VIII. Regional and international cooperation

79. Significant emphasis is being given to strengthening regional institutional infrastructure to help small island developing States achieve sustainable development. To maximize economies of scale, share human resource capacity and promote more efficient use of donor support for regional initiatives, regional intergovernmental and technical organizations have increasingly undertaken many activities, including coordination of regional and subregional projects, organizing workshops and supporting Governments in the preparation of national plans. Examples of important initiatives are given below.

80. The Pacific Islands Forum recently published a resource book to assist policy and decision makers with information to ensure effective implementation of appropriate resilience-building measures. This is but one result of the Pacific-Japan cooperation project, which has developed a portfolio of project-based responses for the Pacific island States.

81. The Caribbean Renewable Energy Development Project was established to foster greater use of renewable energy in the Caribbean, with a view to transforming the environment for research and investment in renewable energy technologies. The project reduces risks for investors in renewable energy projects, ranging from wind and biomass cogeneration to photovoltaics and hydropower. Regional programmes designed to remove barriers to renewable energy use have also been initiated in small island developing States, some with the support of GEF resources.

82. Support for small island developing States by the agencies of the United Nations system is ongoing. Relative initiatives were identified in a draft programme to operationalize the Mauritius Strategy (A/60/401). Measures for energy efficiency and the development of renewable energy are among the key interventions by United Nations agencies working in small island developing States.

83. Small island developing States may have access to resources from the GEF trust fund for activities associated with their reporting obligations under the United Nations Framework Convention on Climate Change. Many have used the resources to establish climate-change committees, develop national climate-change action plans and prepare public awareness campaigns on climate change and adaptation measures. Island States have been active in regional cooperation activities designed to help build capacity for conducting vulnerability and adaptation assessments and to mainstream the issue of climate change into development planning. A project on mainstreaming adaptation to climate change, which focuses on the design and implementation of adaptation strategies in the Caribbean, is an example of such regional cooperation.

84. The United Nations Conference on Trade and Development (UNCTAD) offers assistance to small island developing States towards implementing appropriate trade adjustment strategies and enhancing their competitiveness in international markets.

Assistance includes support for product diversification and the development of niche markets. Capacity-building to strengthen their participation in trade negotiations at the regional and international levels is also an important area of UNCTAD support.

85. Other innovative funding mechanisms exist and can be emulated. The Global Sustainable Energy Islands Initiative, a consortium of international non-governmental organizations and multilateral institutions, is an example of support for the Alliance of Small Island States by bringing renewable energy and energy efficiency projects, models and concepts together in sustainable energy plans. The Initiative seeks to showcase national efforts to significantly reduce greenhouse gasses and to accelerate the transition of small island developing States towards cleaner, more sustainable energy use. Inaugurated at Johannesburg, South Africa, in 2002, the first five-year plan was initiated with the development of national sustainable energy plans and projects in Saint Lucia, Grenada and Dominica. The Initiative, which is committed to raising US$ 100 million during the first period for energy investment, is a model partnership with the wider international community that would be of significant value for long-term sustainable energy development in small island developing States. There has also been bilateral support from the donor community for island States.

IX. Continuing challenges

86. **Small island developing States will continue to tackle the fundamental challenge of managing competing priorities for development with limited resources at the disposal of Government and local decision makers. The pursuit of innovative financing and new partnerships to meet this challenge will therefore remain a priority.**

87. **With deep political commitment, small island developing States have expressed the need to strengthen integrated decision-making and implementation to ensure a well-coordinated, multisectoral approach to resilience-building through enhanced energy efficiency, alternative energy and management of pollution, promotion of industrial development and climate-change adaptation. The development and implementation of national sustainable development strategies in small island developing States is an important step in that regard.**

88. **There is much scope for the development of renewable energy sources. In the Caribbean, for example, renewable energy accounts for less than 2 per cent of the region's commercial electricity. Low levels of renewable energy are mainly due to a lack of awareness and understanding of those energy sources and to the limited access to technologies required to tap them. The development of renewable energy technologies and the promotion of their use, including through public education, therefore remains a priority for many small island developing States, particularly through public education and awareness.**

89. **Small island developing States continue to focus attention on the strengthening of institutional and human capacities to facilitate vulnerability assessment, energy management, disaster preparedness and mitigation at the national level, supported by action at the regional level. Long-term attention will have to be paid to the development of specialized skill sets in relevant**

fields, such as climate modelling for small island developing States, disaster management and scientific and technological research for the development of renewable energy sources. The strengthening of institutions for data collection and analysis is also critical for effective monitoring and assessment. In the interim, small island developing States have expressed their interest in a facility for the deployment of short-term experts to bridge skills gaps.

90. **The expansion of trade will continue to be the main source of income for small island developing States. Support will be required for diversification strategies, the development of niche markets and the exploration of innovations in industry, such as the transformation of sugar cane plantations to support an ethanol production industry.**

Notes

[1] *Official Records of the Economic and Social Council, 2005, Supplement No. 9* (E/2005/29), chap. I, sect. C, resolution 13/1, para. 7.

[2] See www.unep.org/GEO/pdfs/Caribbean_EO.pdf.

[3] See ECLAC *Renewable Energy Sources in Latin America and the Caribbean: Situation and Policy Proposals* (2004).

[4] See *World Bank Economic Report* (2000).