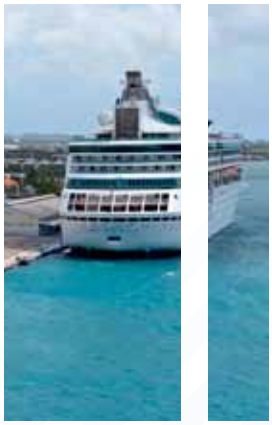
SIDS-FOCUSED GREEN economy

AN ANALYSIS OF CHALLENGES AND OPPORTUNITIES











UNEP

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Regional Seas

PARTICIPATING INSTITUTIONS

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DESA and its predecessors have helped countries around the world meet their economic, social and environmental challenges for more than 50 years. DESA's mission - to promote development for all - reflects a fundamental concern for equity and equality in countries large and small, developed and developing.

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FOREWORD

Small Island Developing States (SIDS) have placed sustainable development prominently on their agenda for twenty years, since the 1992 Earth Summit recognised the special case of SIDS.

The concept of the Green Economy is a relatively new idea, which has been selected as one of the prominent themes of the Rio+20 Conference. For SIDS like other developing countries, the concept needs to be interpreted according to their individual sustainable development priorities and national economic and social conditions.

At the same time, the development and implementation of a Green Economy strategy would have to be consistent with the Barbados Programme of Action and the Mauritius Strategy of Implementation that have clearly outlined the way forward in pursuit of sustainable development for SIDS. The Rio+20 Conference provides an opportunity in particular for SIDS, to start taking advantage of what a Green Economy approach might offer to them.

This present synthesis publication, "SIDS-Focused Green Economy: An Analysis of Challenges and Opportunities", jointly prepared by UNDESA and UNEP, and to which FAO, the GCIAR-Worldfish Center and UNEP/GRID-Arendal have contributed, seeks to highlight important issues in selected sectors of particular relevance to SIDS with respect to the Green Economy, and provides a number of SIDS-focused policy recommendations in the respective sectors.

In the preparations for Rio+20, Member States, in conjunction with other stakeholders, have identified several focus areas for priority attention for SIDS. These are, *inter alia*: small-scale Fisheries and Aquaculture, Tourism, Water, Energy, and Waste, which are included in this report. It is clear to all that efforts must be made to create the necessary enabling environment towards a more effective development pathway. A green economy is such an approach, and a means to achieving sustainable development. It provides a platform for guiding discussion towards implementation in priority areas and cross-cutting issues in the hope of strong and consolidated action from all Member States.

This Synthesis Report intends to help further engage SIDS in particular, but entire international community as a whole, to review the proposals. It is hoped, that this Report will assist in stimulating more policy deliberations on green economy, and pursuing the strategies that best suit the needs of countries.

UNEP **DSD-UNDESA**

UN Photo/Martine Perret

CONTENTS

3 Foreword

6 Introduction

8 Small-Scale Fisheries and Aquaculture

11 Tourism

14 Water

17 Energy

20 Waste

22 Conclusions

24 Rio + 20

27 Acknowledgements



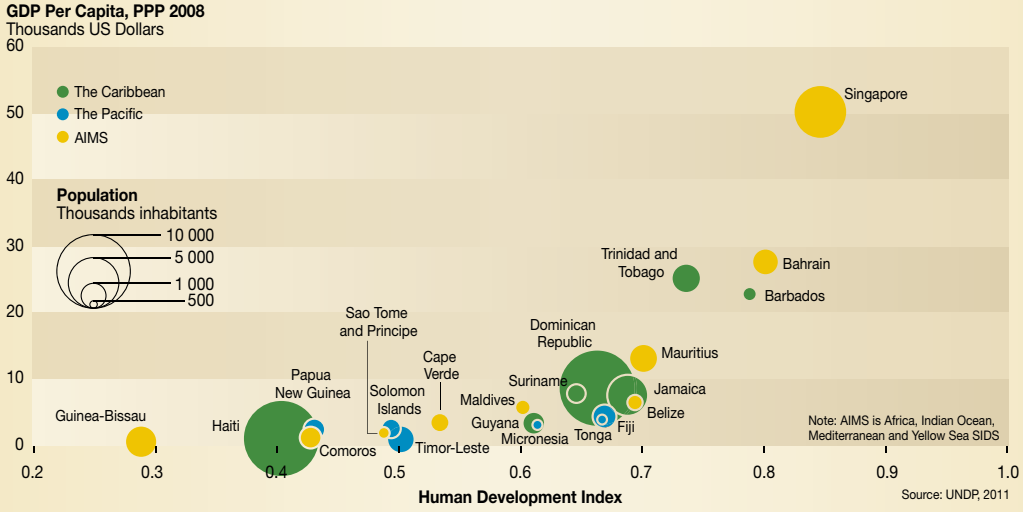
INTRODUCTION

Small island developing states (SIDS)[1] are a group of countries that "*share similar sustainable development challenges, including small population, limited resources, susceptibility to natural disasters, vulnerability to external shocks and excessive dependence on international trade. Their growth and development is often further stymied by high transportation and communication costs, disproportionately expensive public administration and infrastructure due to their small size, and little to no opportunity to create economies of scale*"[2].

The Earth Summit in Rio de Janeiro in 1992 marked the first time that the special characteristics of SIDS were paid significant attention and were recognised as a distinct group. In 1994, the first Global Conference on the Sustainable Development of SIDS was held in Barbados, under the auspices of the United Nations. It resulted in the adoption of the Barbados Programme of Action (BPOA), which recognised the unique and particular vulnerabilities of SIDS and identified the sustainable development challenges SIDS face. The BPOA explicitly identified key areas requiring urgent action.

In 2005, the high-level international meeting in Mauritius reviewed the implementation of the BPOA and adopted the Mauritius Strategy for the further implementation of the BPOA, which underscores the need to, inter alia, mobilize domestic resources, attract international flows, and promote international trade as an engine for development. It also stresses the need to enhance coherence and governance of the international monetary, financial and trading systems in order to complement SIDS' development plans.

A great socio economic diversity for Small Island Developing States



[1] Recognised as three regions: the Caribbean, the Pacific and the Atlantic, Indian Ocean, Mediterranean and South China Seas (AIMS).

[2] UN DESA. 2007. *Who are the SIDS?* www.un.org/esa/sustdev/sids/sidslist.htm

In 2012, on the 20th anniversary of the Earth Summit, world leaders and Heads of States will again affirm political commitment to sustainable development[3]. The Conference will have as its theme, "*a green economy in the context of sustainable development and poverty eradication and, the institutional framework for sustainable development*"[4]. Coming at a time in which financial markets are still recovering from a global economic crisis and when the economies of SIDS have been severely impacted by external factors originating in developed countries, the "green economy" has stirred a great deal of interest regarding its possibilities as a means of alleviating this crisis.

A green economy "*is one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities*"[5]. This definition is amplified further to mean an economy that is "*low carbon, resource efficient and socially inclusive*[6]. It is also envisaged that in a green economy "*growth in income and employment will be driven by public and private investments that reduce carbon emissions and pollution, enhance energy and resource efficiency, and prevent the loss of biodiversity and ecosystem services*".

> UNEP defines a green economy as one that results "*in improved human well-being and social equity while significantly reducing environmental risks and ecological scarcities*"
>
> Source: UNEP, 2011

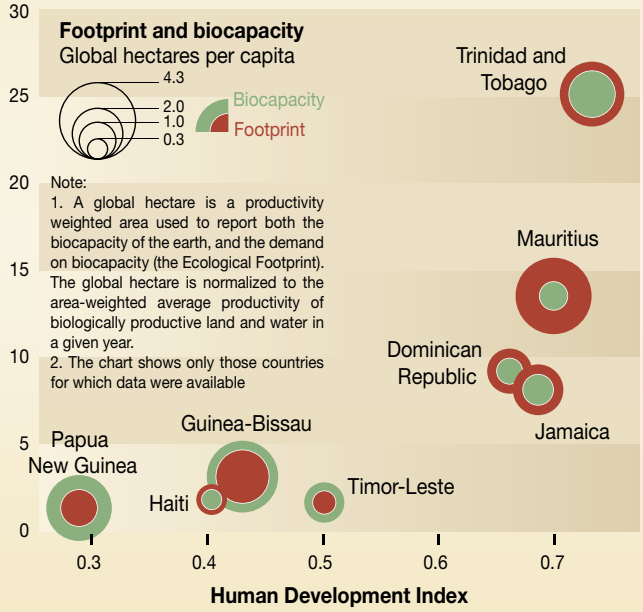
Individual SIDS have and are interpreting the green economy concept according to their individual sustainable development priorities and national economic and social conditions.

While there is no consensus on the concept of a green economy for SIDS, transitioning to a low-carbon economy is directly linked to the critical importance placed on all aspects of sustainable development efforts of SIDS.

The movement towards a green economy is seen as a critical pathway to achieving sustainable development. More importantly, it is an opportunity for investments in green industries, job creation and improvements in human welfare. However, in order to achieve those objectives, it is vital that the right climate or enabling conditions are provided to generate and stimulate both public and private sector investments that incorporate broader environmental and social criteria. From this perspective, the overall goals of a green economy are supportive of the sustainable development concept, which had as its main objectives: development and poverty eradication, predicated on sustainable use of environmental resources.

In this Synthesis Report, five development sectors for SIDS - small-scale fisheries and aquaculture, water, tourism, energy and solid waste - are analysed in an attempt to show how a transition to a green economy can assist in addressing some of the most critical challenges SIDS face while stimulating economic development, maintaining economic stability, facilitating job creation while conserving resources. These sectors are not only inter-related, but also reflect the SIDS' challenges as they relate to land and water scarcity, dependence on imported energy, high costs associated with waste management and the vulnerability and fragility of the tourism sector. **This Synthesis Report will seek to show how a transition to a green economy can contribute to advancing sustainable development in SIDS.**

Ecological footprint and the wealth of SIDS



Source: UNPD online database, 2001; Global Footprint Network, online database, 2010.

[3] UN General Assembly. 2009. *Resolution A/RES/64/236*. www.uncsd2012.org/.
[4] UN General Assembly. 2009. *Resolution A/RES/64/236*. www.uncsd2012.org/.
[5] UNEP. 2010. Green Economy. *Developing Countries Success Stories*. www.unep.org/greeneconomy.
[6] UNEP. 2011. *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication*. www.unep.org/greeneconomy.

SMALL-SCALE FISHERIES AND AQUACULTURE



The future of SIDS lies in the oceans – this often-quoted statement is confirmed when the values of ecosystem services provided by oceans to these island states are explored. Though they are small, these nations hold jurisdictions over coastal waters and open seas that are many times larger than their landmasses. A 'green economy' fisheries and aquaculture sector is one that is ecologically sustainable, provides a higher level of economic goods and services at lower environmental costs and equitably distributes those benefits.

One of the closest connections between humanity and the oceans is found among those who harvest the seas. In SIDS, oceans represent an integral component of life, as it is part of their cultural practices, social fabric, food security and economy, particularly through fisheries. Fishing both as a livelihood and as a provider of essential food, is vitally dependent on healthy marine ecosystems. SIDS marine ecosystems face the vast array of both immediate and long-term threats that are found throughout the world's oceans. However, the impact on coral reefs as essential fish habitat from rising seawater temperature, ocean acidification and increased storms is a particular challenge.

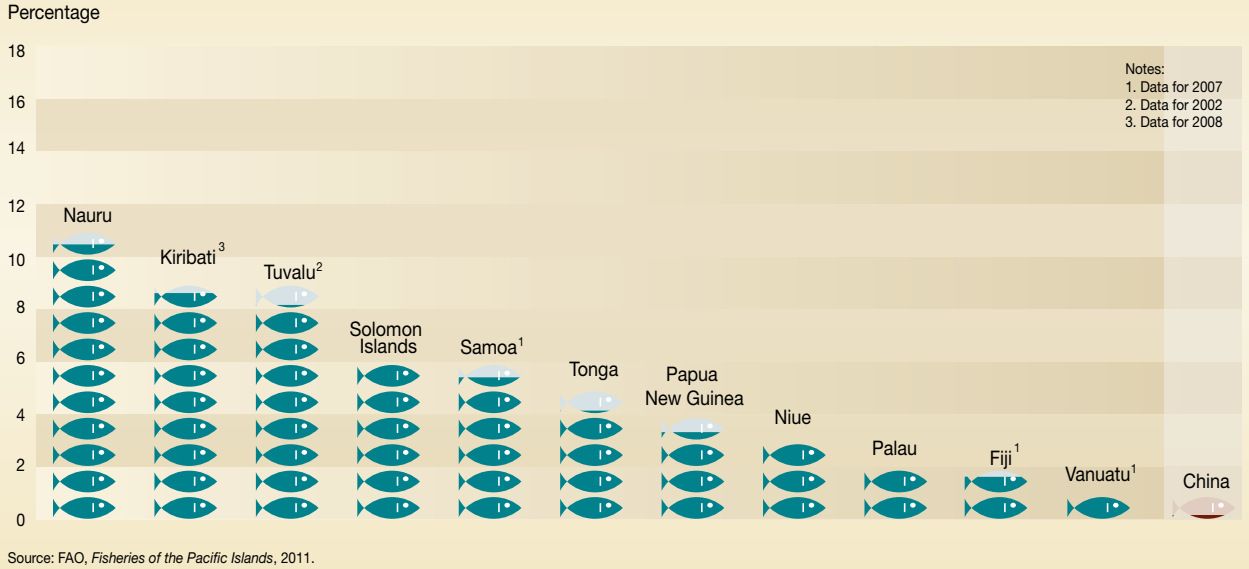
Globally, 180 million people are engaged in fisheries and aquaculture activities, which sustain over 0.5 billion people, while small-scale fisheries employ close to 110 million people[7]. Many small-scale operators are self-employed and engaged in both subsistence and commercial activities[8]. Aggregate capture fisheries play a major role in many national economies, especially in the Pacific SIDS, where capture fisheries can contribute as much as 10% of GDP[9]. Fish consumption here accounts for 50-90% of animal protein in the diet of coastal communities while national fish consumption can be as much as 3-4 times higher than the global average per capita[10].

Aquaculture is one of the fastest-growing animal-food production sectors. This type of farming provides an opportunity for countries to produce fish protein for consumption, supplementing catches. Small-scale aquaculture is often based around family labour, and ponds or farms are housed family land-holdings. There are also large commercial-based operations that showcase substantial technological, labour and capital inputs. The types of aquaculture products vary

7. FAO. 2010. *The State of World Fisheries and Aquaculture* and FAO. 2011. *Report on the 29th Session of the Committee on Fisheries*. Report No. 973.
8. FAO. 2011. *Report on the 29th Session of the Committee on Fisheries.* Report No. 973.
9. Gillett, R. 2011. *Fisheries of the Pacific Islands: Regional and National Information.* Food and Agriculture Organisation of the United Nations, Regional Office for Asia and the Pacific.
10. Bell J.D., M. Kronen, A. Vunisea, W.J. Nash, G. Keeble, A. Demmke, S. Pontifex, and S. Andréfouët. 2009. *Planning the Use of Fish for Food Security in the Pacific.* Marine Policy, 33(1): 64–76.

The importance of fish for selected SIDS

Fishery generated GDP on total GDP (2006)



Source: FAO, *Fisheries of the Pacific Islands*, 2011.

among SIDS. For example, in the Caribbean, it is generally limited to freshwater tilapia, while in the Pacific SIDS, a number of products ranging from shrimp and fish to oysters and pearls are produced. Even though aquaculture lags behind traditional methods of fish production, it can prove to be sustainable and provide green jobs in SIDS economies.

Pollution, habitat loss and alteration, destructive harvesting methods, over-exploitation, invasive alien species, oceanic acidification, natural disasters and climate change are some of the natural and anthropogenic factors threatening fisheries in SIDS. Amid those challenges, the fisheries sector is expected to meet the demands of a growing population and increasing requirements for fish protein. The effects of climate change are also anticipated to indirectly affect fisheries, as changing water temperature impact negatively on coral reefs and mangroves that function as nurseries, habitats and foraging grounds for fish. Also associated with changing weather patterns, are shifts in migratory patterns of fish species, affecting their availability during different periods of the year.

Enabling Environment for Transition to a Green Economy

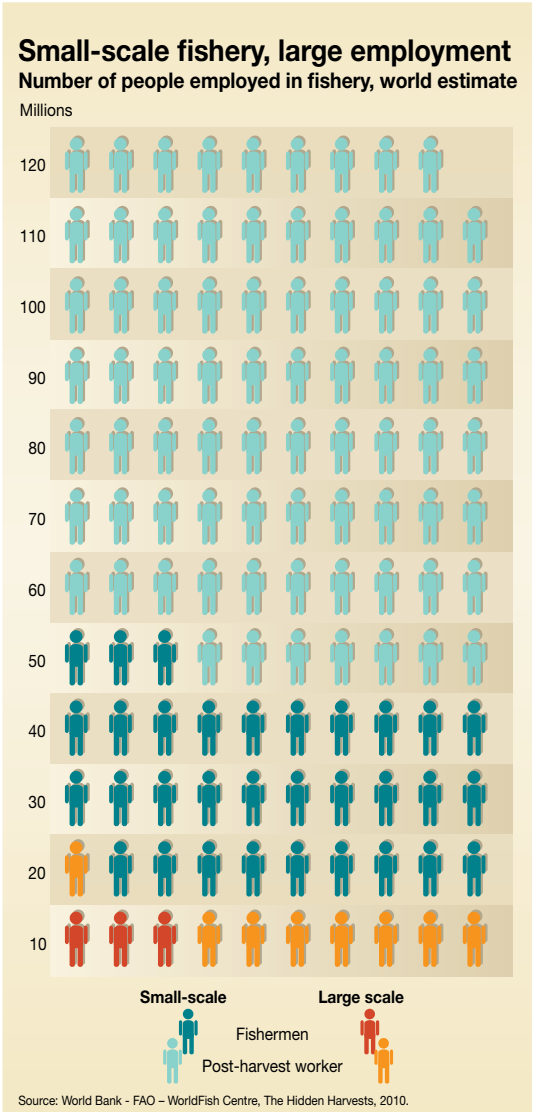
A 'green economy' fishery sector is one that is ecologically sustainable, provides a higher level of economic goods and services at lower environmental costs and equitably distributes those benefits. The harmonious and balanced development of small-scale fishing communities with other coastal developments will be critical in assuring their continued and enhanced contribution to food security, poverty alleviation and protection of economic, social and cultural rights. Cross-sectoral integration and spatial planning should be critical elements in an overall application of the Ecosystem Approach to Fisheries and Aquaculture Management.

Fair and responsible tenure systems to turn resource users into resource stewards need to be established through appropriate legal frameworks, emphasising the opportunities and traditions of community-based management. Regulation should focus on the creation of appropriate incentive systems and decentralised, easily enforceable regulations. In small-scale coastal fisheries, resource users are to be given preference to engage monitoring, control and surveillance measures.

Upfront costs of a transition to sustainable and equitable management regimes can be recovered by the resource rent from better managed, more efficient and environment friendly fisheries. In the short term, a transition will most likely require some form of income support to reduce fishing capacity, support re-qualification initiatives and investments in new techniques and technical expertise. Sources of funds include access agreements to foreign fleets, and increasing commodity value through certification schemes (including ornamental fish). Donor funding possibilities should be explored.

Achieving sustainability would require balancing the competing ecosystem services provided by oceans, and adopting an integrated approach for greening the sector.





Transitioning to a green economy will require introducing specific measures for policy planning and institutional reform, sustainable financing, investment in technology and building awareness. The existing FAO Code of Conduct for Responsible Fisheries and its related international agreements provide a strong framework for the sector, but will need resources and incentives for implementation at national and regional levels. Initial upfront costs can be covered by resource rent gained from foreign fleets engaged in offshore fishing. The development and investment in 'green' technologies such as efficient fishing methods, energy-efficient refrigeration technologies and improved waste management in fish handling and processing also need to be supported. In the aquaculture sector, preference should be given to low-impact operations complying with internationally recognised certification standards with regards to feeds, water quality and coastal habitat degradation in particular, to ensure the sector's rapid development contributes to environmentally sustainable growth.

Building industry and consumer awareness will support sustainable fisheries and aquaculture farms that provide fair and equitable benefits to those employed in the sector and their communities.

TOURISM

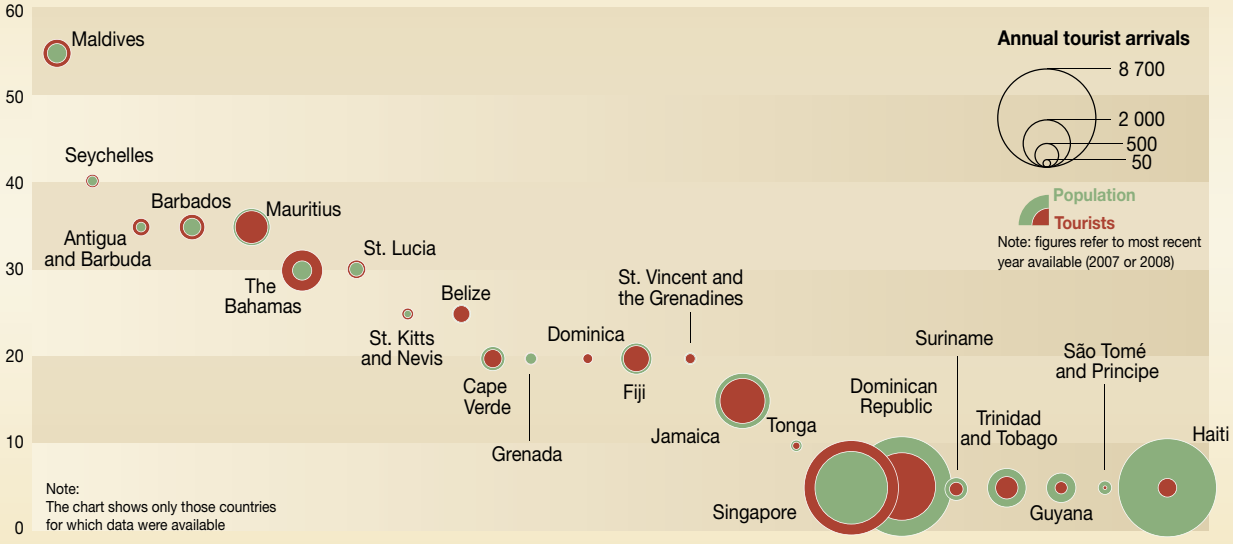


Tourism is one of the world's largest business sectors, growing by a staggering 90% from 1995 to 2010. It is responsible for over 250 million jobs or more than 8% of total employment and accounts for over 9% of the world's GDP[11]. This sector involves large global movement of people annually, and the supply chain extends from the cities of the north to remote islands.

Tourism is a vital sector of the economies of most SIDS. For more than half of the SIDS, it is their largest source of foreign exchange. The social, economic and environmental well-being of many SIDS is tied to this sector[12]. Tourism receipts represent more than 30% of their total exports; in comparison, the average for the world is just over 5%[13].

Tourism in SIDS

Share of tourism on total GDP
Percentage



Source: UN-Data, The World Bank, online statistical databases.

[11] UNEP. 2011. *Keeping Track of Our Changing Environment: From Rio to Rio+20.*

[12] UNDESA.2010. *Trends in Sustainable Development: Small Island Developing States (SIDS)*. New York, United Nations.

[13] Based on World Bank data, 2011.



Tourists visit SIDS because of the reefs, beaches and unique cultures and ecosystems. Sustaining a viable tourism sector is dependent on maintaining these assets. Coral reefs play a substantial role in maintaining marine and coastal ecosystems, functioning as habitats for fisheries, while providing valuable coastal protection, beach sand and building materials. Reefs form the backbone of both the tourism and fisheries sectors. Though the tourism industry in SIDS is mainly driven by the private sector, most of the key attraction assets are public. The challenge for states is to integrate many discrete private enterprises to conserve and use these assets sustainably.

The tourism industry is linked to the energy and water sectors, through its energy-intensiveness and the demand for clean potable water for tourists and water-based tourism activities. The tourism industry is a major consumer of both energy and water due to the large number of persons transported and the huge need for water to meet the needs of visitors. Given that most SIDS import their energy supplies and face various challenges with regard to water, investment in greening tourism is vital to reducing additional burdens placed on inter-related sectors.

Climate change presents one of the most significant challenges to the sector. Rising sea levels have can cause loss of land along coastlines of low-lying islands, disrupting economies and livelihoods. For example, a 50-centimeter rise in sea level will result in Grenada losing 60% of its beaches, while a 1-metre rise would inundate the Maldives. Climate change may cause coral bleaching to become an annual occurrence causing further losses in revenue. Dominica has reported that 50% of its corals are bleached[14], and coral bleaching in Tobago affected an average of 66% of its hard corals[15] in 2005 alone.

Enabling Environment for Transition to a Green Economy

The tourism industry should be one of the lead industries in the promotion of green initiatives, being both an industry dependent on natural resources and a major contributor to employment and economic growth. Greening the sector will involve the promotion of principles and initiatives that can be sustained within social, economic, cultural and environmental contexts as the economic benefits derived can be used to address poverty alleviation. However, if poorly managed gender disparities, cultural and

[14] UNFCCC. 2005. *Climate Change, Small Island Developing States*. www.unfccc.int.

[15] O'Farrell, S. & Day, O. 2005. *Report on the 2005 Mass Coral Bleaching Event in Tobago: Part 1. Results from Phase 1 Survey*. Buccoo Reef Trust and Coral Cay Conservation in collaboration with the Tobago House of Assembly and the Travel Foundation. www.buccooreeftrust.org.

environmental degradation and skewed benefit sharing of wealth can occur[16].

Greening tourism is more than promoting ecotourism. Rather, it requires a shift across the entire industry pertaining to the implementation of policies, practices and programmes that embrace sustainability, focusing on:

- conservation of natural resources, maintaining the resource base and protecting biodiversity and ecosystems;
- the use of renewable sources of energy;
- reduction of water consumption;
- maintenance of culture, traditions and heritage and the promotion of cultural tolerance and respect; and
- generation of income for local communities; and the alleviation of poverty in communities[17].

For SIDS to derive the greatest possible benefit from the greening of their economies, they will have to adopt comprehensive national tourism plans that are fully integrated with overall national development. Only through such processes will concepts and planning tools such as setbacks, disaster risk management and strategic environmental assessments become mainstreamed in the development and approval stages of governance. Policies and regulatory frameworks that account for the benefits of environmental resource as well as the costs their conservation and managing can become important catalysts for the adoption of more environmentally sound practices by the sector.

Sharing of successful approaches among SIDS who experience many of the same challenges and obstacles will be important. They can also be valuable partners in building capacities. The bulk of tourism in most SIDS is carried out by small and medium enterprises who could contribute more to Green Economic growth if provided with better access to information, capacity and technology. Better organisation of tourism in each SIDS, provision of technical support and information and collaboration among tourism sector enterprises and government will be essential in the transition to a green economy.

Fruitful relations with specific chains or operators can be powerful avenues for local and national implementation of greening tourism and related capacity building. For tourism,



foreign investors often have to meet financing requirements such as environmental audits or social impact assessments from banks and insurance companies – despite these valid demands, ways need to be found to make them become strong partners in supporting SIDS Green Economy.

SIDS cooperation at a regional and global scale to develop shared standards for tourism development is a powerful approach to achieve the greatest societal benefits from cooperation with the private sector.

[16] UNEP. 2005. Atlantic and Indian Oceans Environment Outlook. Special Edition for the Mauritius International Meeting for the 10-year Review of the Barbados Programme of Action for the Sustainable Development of Small Island Developing States.

[17] UNEP. 2011. Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication. www.unep.org/greeneconomy.



WATER

Water plays a critical role in supporting economic development, public health and environmental protection. Greening the water sector can be a win-win situation where standards of health and livelihood of citizens are improved, the environment is protected and economic activity is increased. The sector is closely tied to others such as tourism, waste (wastewater pollution), energy (distribution, hydropower and supplies for cooling) and fisheries (reflected by the health of inland and coastal fisheries, a direct result of water quality). Agriculture is also an important industry in some SIDS (e.g. sugar cane) and is often constrained by access to water[18]. The availability of clean potable water has significant effects on the health of population.

SIDS, though surrounded by water, grapple with limited potable water supplies, poor potable water quality, sanitisation and inefficient distribution systems. The connectivity of the different components of the water cycle is also important, as

Challenges Faced by Specific SIDS Groups

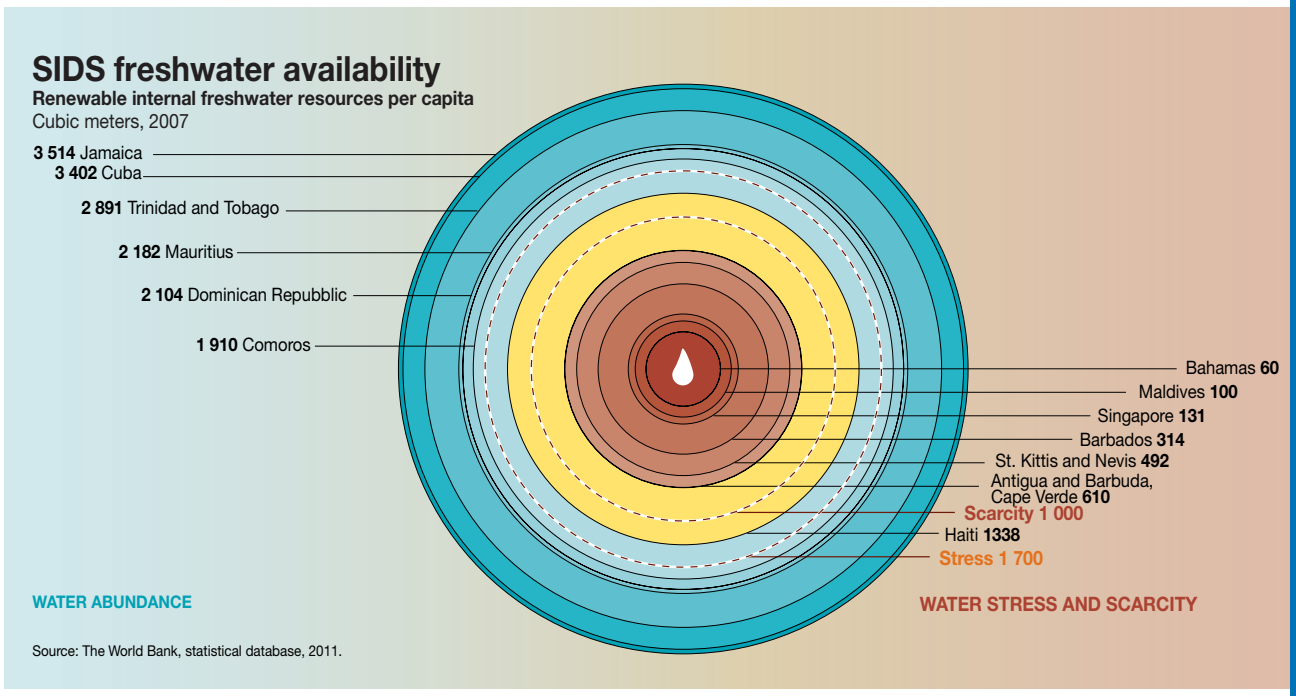
SIDS Group	Water Resource Issues
Pacific[19]	• absence of reliable groundwater lenses • polluted groundwater supplies on larger atolls • mass sedimentation caused by unchecked watershed developments • poor sanitisation • variable rainfall patterns • salinisation • inefficient distribution networks
AIMS[20]	• variable precipitation • high runoff exacerbated by the steepness of the slopes in catchment areas • high soil porosity • competing demands from tourism, industrial sectors and population growth • demands caused by population growth
Caribbean[21]	• highly seasonal rainfall • deforestation • conflicting land use activities within watersheds • reduced absorption capacities of soil due to erosion • inefficient distribution networks • demands by rapid population growth and competing economic sectors

[18] Whilst agriculture is not covered as an individual section, this sector remains important for SIDS' economies and it is important for them to improve food security through productivity and adaptability to climate change.

[19] UNEP. 2005. *Pacific Environment Outlook. Special Edition for the Mauritius International Meeting for the 10-year Review of the Barbados Programme of Action for the Sustainable Development of Small Island Developing States*. www.unep.org.

[20] UNEP. 2005. *Atlantic and Indian Oceans Environment Outlook. Special Edition for the Mauritius International Meeting for the 10-year Review of the Barbados Programme of Action for the Sustainable Development of Small Island Developing States*. www.unep.org.

[21] UNEP. 2005. *Caribbean Environment Outlook. Special Edition for the Mauritius International Meeting for the 10-year Review of the Barbados Programme of Action for the Sustainable Development of Small Island Developing States*. www.unep.org.



shortages along one point affect another. While there are similarities between the three groups of SIDS, they also face some specific issues:

For SIDS, being able to meet the growing demands for access to clean potable water is one of the greatest challenges faced by this sector. According to the World Health Organisation (WHO), diarrheal disease accounts for 1.8 million deaths every year[22]. It was estimated that 88% of that burden is attributable to unsafe water supply, sanitation and hygiene, and is mostly concentrated in children in developing countries. In Kiribati for example, 1 in every 4 people visit a clinic because of diarrhoea or dysentery annually[23].

Climate change poses a significant challenge to the management of water in SIDS. The islands' dependency on rainfall leaves them vulnerable to both long-term and short-term changes in rainfall patterns. The effects of climate change will be intensified by growing demands for water as populations grow and increase in the levels of pollution while causing infections by the use of unsanitary water. It is predicted that there would be a 10% reduction in average annual rainfall by 2050. Freshwater lenses on atoll islands are anticipated to diminish by as much 29-65%, while water tables may move closer to the surface resulting in increased rates of evapo-transpiration[24].

Significant pressure is placed on existing freshwater systems in SIDS by urbanisation, unsustainable agricultural practices, the demands of tourism, mining and deforestation. These pressures exacerbate environmental conditions and ultimately affect the fragile economies of these islands.

Individual countries have initiated various programs to ensure better management of their water resources. Some of these projects include Integrated Water Resource Management (IWRM)[25]/ Integrating Watershed and Coastal Areas Management (IWCAM)[26] programmes, national water planning initiatives[27] and rural/ community based projects which have served to raise awareness of the importance of effective

[22] Waterborne diseases, caused by pathogenic microorganisms in contaminated freshwater, result from poor water quality. These diseases include diarrhoea, dysentery and typhoid.

[23] This is based on 2005 data.

[25] Mimura, N., L. Nurse, R.F. McLean, J. Agard, L. Briguglio, P. Lefale, R. Payet & G. Sem. 2007. Small Islands. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden & C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 687-716.

[26] The GEF Pacific IWRM Project is co-implemented by the United Nations Environment Programme (UNEP) and the United Nations Development Programme (UNDP), and executed by the Pacific Islands Applied Geoscience Commission (SOPAC) in cooperation with 14 Pacific Island countries. The project is developing "Ridge to Reef – Community to Catchment" IWRM in the participating countries.

[27] The GEF-IWCAM Project is co-implemented by the United Nations Environment Programme (UNEP) and the United Nations Development Programme (UNDP), and co-executed by the Secretariat of the Cartagena Convention, UNEP Caribbean Regional Coordinating Unit (UNEP-CAR/RCU) and CEHI.



Box 1 Examples of Simple Water Management Technology implemented in SIDS

Rainwater Harvesting is widely practiced and encouraged in many SIDS as rainfall is quite regular. It is common for households to incorporate rainwater storage tanks and cisterns to supplement their supplies at the household level, which puts an onus on the individual to maintain the system in a safe state. This requires investment in broad scale education and awareness-raising on the household level as well as on suitable technology.

Groundwater Recharge allows for the safe collection and transmission of rainwater into the underlying aquifer and is appropriate for areas dependent on shallow rain fed groundwater supplies. This is common in Barbados and Trinidad, where water extracted from recharged aquifers is often of an acceptable quality.

Desalination is a last resort option due to its high price (both from material investment and operational costs). Despite technological advances (such as low pressure membrane technology), water obtained by reverse osmosis remains the most expensive per litre option as a result of expensive equipment, maintenance and costly imported fuel.

water use. Watershed interventions may include reforestation, improved wastewater treatment systems, fencing of riparian areas to restrict livestock access, improved or restricted fertiliser and pesticide application practices, installation of storm water filtering devices and improved building practices to prevent erosion during construction. Further, downstream improvements to water supply and sewerage systems, alternative water source development and increased efficiency of usage can be implemented. Some simple examples include rainwater harvesting, groundwater recharge and desalination.

Enabling Environment for Transition to a Green Economy

As water intrinsically links several sectors, without sufficient water quantity and quality, the development of other sectors will be restricted. For this reason, water management should be considered in all stages of planning and development. Achieving this would require:

Policy: **One of the biggest impediments in investing in water management infrastructure has been the absence of effective water governance. National water resources policies that clearly articulate the jurisdiction, roles and responsibilities of institutions will support SIDS**. In addition, water resource management should be factored into national economic development and growth planning. This will ensure that water resources are distributed with the aim of providing maximum socio-economic benefits for the ***entire population.***

Legislative and Regulatory Reform: A revision or updating of water resource legislation should include innovative and adaptive mechanisms such as progressive billing to link payment of the resource to its use.

Linking Production and Consumption (Supply and Demand): Demand and consumption of water is complicated by the notion that large segments of the population are deemed to be below the threshold for the imposition of a tariff. This has made imposing tariffs or implementing a user-pay system difficult. **Progressive billing has, however, succeeded in reducing water consumption whereby low volume users pay a reduced fee up to a certain level, after which the tariff increases.**

Sustainable Financing: Direct charges to customers for water and sanitation services are often insufficient to cover operational costs. Financing for implementation of a green economy can be derived from a combination public and private sector investment and overseas development to bridge charges to customers for water and sanitation services and operational costs.

Capacity Building and Sharing: Reorganising roles and responsibilities between agencies/ ministries will cater to a more effective use of limited financial and human resources and areas of overlap can be integrated. By promoting community involvement in water management through the implementation of green community-based projects, limited human resources can be increased.

ENERGY



SIDS face a number of challenges in pursuit of energy security and poverty reduction, including high and rising oil prices, inadequate policies and regulations, insufficient promotion and investment in renewable energy and energy efficiency; lack of financing and technology transfer.

Energy dependence is a major source of vulnerability for many SIDS that have little or no access to modern and affordable energy sources. The dependence on imported petroleum continues to cause severe imbalances in trade, resulting in a serious drain on limited national financial resources. Prices of petroleum products in SIDS are among the highest in the world as fluctuations in supply and demand, along with the volatility of the global oil market, as well as difficulties in obtaining the foreign exchange to pay for imported energy resources, exert significant pressure on SIDS' economies. For example, in the Pacific SIDS, prices of petroleum fuels are typically 200–300% higher than international values.

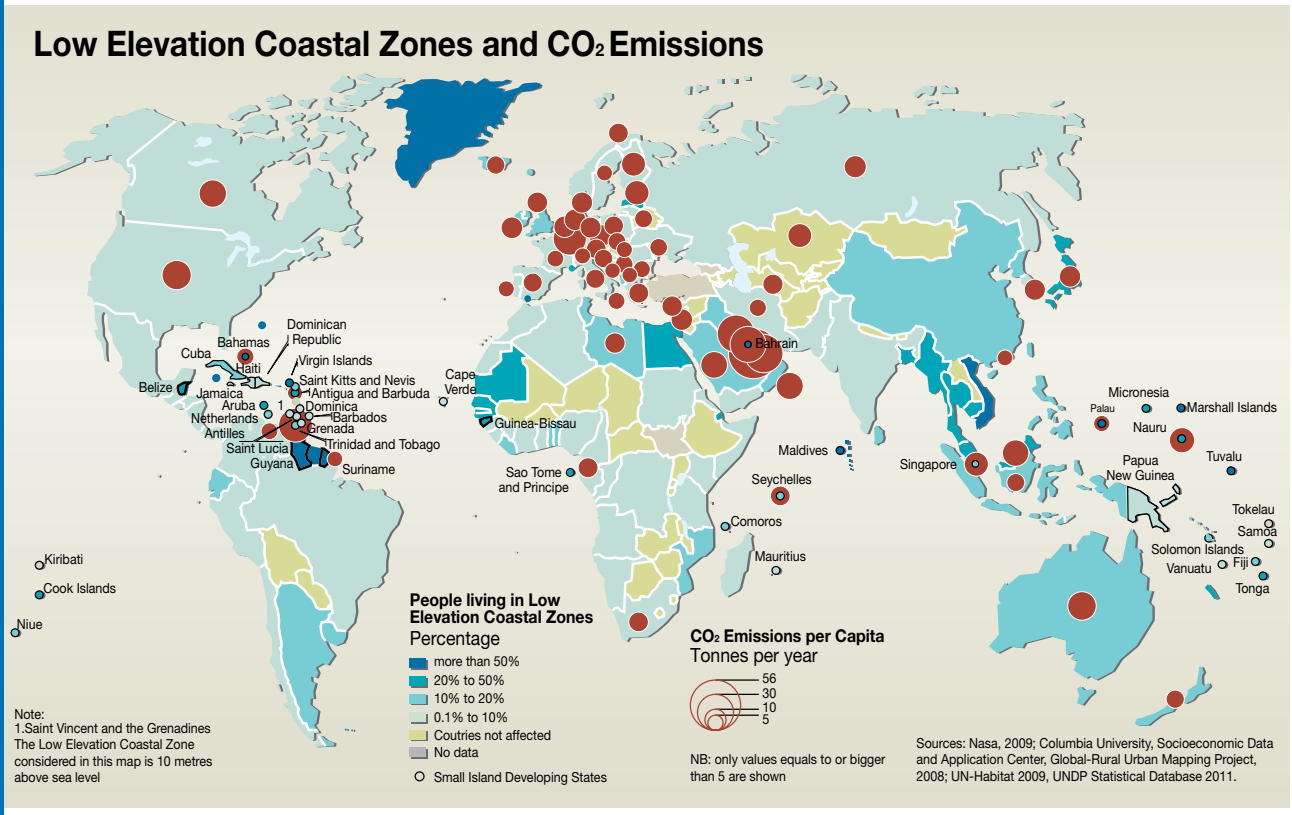
In addition to the consumption of fossil fuel, there are a number of SIDS, which remain heavily dependent on traditional forms of biomass-based energy[28] for cooking purposes. This not only results in high emissions of carbon dioxide but it is also a significant contributor to deforestation[29], increased soil erosion, loss of biodiversity, and reduced availability of fresh water resources. Smoke makes meal preparation hazardous to the health of the household, particularly women and children. As rural and urban low-income households do not have access to alternative energy sources, degradation of local, energy-providing, ecosystem services make these populations more vulnerable.

Many SIDS have drafted and adopted national and regional energy policies and strategies which seek to make use of their limited access to renewable energy supplies such as solar, wind, ocean, wave, geothermal, biomass and hydropower and conserve the use of energy resources, in order to minimise future dependence on imported energy. The salient tenets of the green economy concept, growth in income and employment, are predicated on an investment platform of reduced carbon emission and pollution and an enhancement of energy resources and efficiency.

In the Pacific, the national energy policies of Fiji and Vanuatu promote the production of biofuels through planting on degraded lands. Furthermore, in Fiji, Solomon Islands, Samoa and Vanuatu hydropower is increasingly being used for electricity production. In Barbados and Antigua, the government has provided subsidies to encourage the use of solar water heaters. In Jamaica, Dominica and Haiti there is increasing use of hydropower for electricity production. More recently, commercial biomass has become an important source of renewable energy in many SIDS, mostly in the form of bagasse coming from the production of sugarcane. For

[28] This includes fuel wood from natural forests, coconut shells, husks and stem wood, residues from crops such as coffee, cocoa.

[29] UN. 2010. *Trends in Sustainable Development: Small Island Developing States (SIDS)*. United Nations, Department of Economic and Social Affairs, Division for Sustainable Development.



example, in Mauritius, approximately 15% of the energy requirements of the island are being met from bagasse. With emerging technologies for converting waste to energy, many SIDS are exploring the prospects of converting organic waste into fertilisers and energy[30].

The development of SIDS renewable energy resources has been limited by the availability of appropriate technology, weak institutional mechanisms, and challenges of developing systems for small, remote markets at reasonable cost. In the case of the Caribbean, renewable energy comprises a mere 3% of the regional energy mix. While renewable energy technologies have gotten cheaper, SIDS face a series of challenges including technical capacity, access to predictable low-cost long-term financing and a lack of appropriate energy regulations[31].

Enabling Environment for Transition to a Green Economy

Since 1992, SIDS have invested billions in their energy sector, very little of which has gone into renewable energy, energy efficiency and conservation. For SIDS to successfully make the transition to a green economy and place themselves on the path to sustainable development would require collective action of an unprecedented manner. Recommendations in this regard include:

SIDS-appropriate sustainable energy technologies through technological expertise and sharing mechanisms (e.g. SIDS DOCK) will strengthen SIDS capacity in addressing their energy constraints.

Strengthening a collective SIDS-wide or regional policy approach to sustainable energy development including aggregate purchasing, collective approaches to technology developers, collective approaches to seeking investment financing, and coordinated strategies in research and development will reduce investment costs and achieve economies of scale.

If SIDS are to make the transition to a green economy and achieve sustainable development, they must find a means of reducing their dependence on and importation of fossil fuel. Based on the

[30] UN. 2010. *Trends in Sustainable Development: Small Island Developing States (SIDS)*. United Nations, Department of Economic and Social Affairs, Division for Sustainable Development.

[31] Binger, A. 2009. *Issues Paper on Key Energy Challenges and Their Effects on the Achievement of the Millennium Development Goals (MDGs) in the Caribbean Region: Possible United Nations Development Programme (UNDP) Role in Addressing Such Challenges*. Submitted to the UNDP-Trinidad & Tobago Sub-Regional Centre.



global experience, SIDS can derive significant benefits from the development of renewable energy resources, the implementation of energy efficiency and conservation programmes and the commercialisation of renewable energy technologies. While energy efficient practices can have a significant impact on daily consumption of fuel, the seismic shift required to achieve low carbon economic growth will only be realised through the combination of governmental interventions at the policy, institutional and regulatory levels and the ability to attract private sector investment. Examination of energy-related policy and legislation will be required with close attention being paid to the following components:

- **Policy and Legislation Reform:** Only a limited number of countries have an appropriate legislative framework to guide and meet policy objectives and to administer and regulate the energy sector. Governments are encouraged to articulate energy policies that promote the development of renewable energy resources and synergies between sectors which have significant impact and influence on the energy sector, and to develop the necessary legislation to regulate the relevant operations.
- **Subsidies:** While some have argued for the removal of subsidies in the energy sector, it may be prudent to shift some of those resources or incentive schemes towards the use of, and investment, in renewable technologies and energy conservation.
- **Taxes:** Taxes can be used as an alternative to or in combination with subsidies. As an incentive for investment in renewable energy, government could provide tax relief (e.g. Solar Water Heaters in Barbados) to homeowners to purchase systems. Additionally, developers of such technologies can benefit from tax exemptions from general energy taxes, or for initial investments.
- **Coordinating Mechanisms:** Strengthen coordination mechanisms that facilitate information and exchange of experiences, and that effectively advocate on behalf of island states, to private sector technology developers and managers of private capital to attract technology and financing through mechanisms such as public-private partnerships.

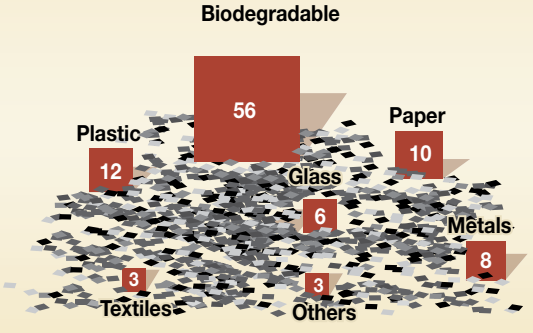
WASTE



Waste management in SIDS, as in other developing countries, is a growing problem because of population growth, urbanisation, changing consumption patterns and the large numbers of tourists. Most of the waste collected is disposed of via sanitary landfilling, as opposed to recycling. This form of disposal represents missed economic opportunities and creates future challenges for SIDS due to the limited availability of land, potential contamination of surrounding ecosystems and the contribution of decomposing garbage to the build-up of greenhouse gases. Even where limited recycling has been pursued, the absence of legal and regulatory provisions for recycling and the remoteness of markets and fluctuating prices limit the attractiveness and opportunities for private sector involvement. Despite the limited availability and reliability of waste generation data, it is estimated that solid waste generation rates in SIDS ranges from 0.75 -2.8kg/per capita with organics comprising close to 50% of the waste stream. Other identifiable components include plastics, paper, metal, textile and glass, all of which have the potential to be diverted and recycled. Given the small volumes of recyclables and limited opportunities for recycling as well as limited markets for recycled materials, much of that waste is disposed of via landfilling.

Pacific regional waste composition

Percentage on total waste



Source: Raji, 2000 (ASK C NEUMANN full reference)

Enabling Environment for Transition to a Green Economy

Greening the waste sector refers to a shift from less-preferred waste treatment and disposal methods such as incineration (without energy recovery) and different forms of landfilling towards the "three Rs": Reduce, Reuse and Recycle. The strategy is to move upstream in the waste management hierarchy based on the internationally recognised approach of Integrated Solid Waste Management (ISWM)[32].

Increasing recognition of value in waste and a growing market for waste is a key driver for the greening of the waste sector. With that, technological advances both in reutilising recycled products as well as in converting waste materials into valuable products open up significant opportunities for job creation and revenue generation. In several SIDS, waste recycling, particularly scrap metal[33] and plastics, have provided valuable employment

[32] UNEP. 2011. Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication. www.unep.org/greeneconomy.

[33] Trinidad Guardian. 2011. *Scrap Metals: A billion Dollar Industry*. September 15, 2011. www.guardian.co.tt/business-guardian/2011/09/15/scrap-metals-billion-dollar-industry.

opportunities for thousands of persons. It is anticipated that with proper management, financing and utilising the 3Rs principle, the sector could generate substantial economic, environmental and social benefits for SIDS. These benefits include resource and energy savings, compost production supporting organic agriculture, energy production from waste, reduced greenhouse gas emissions and an overall contribution to poverty alleviation.

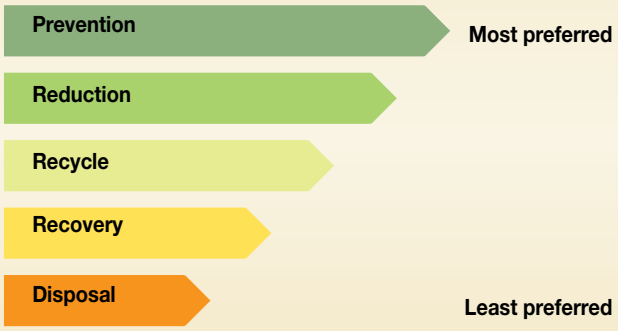
National Integrated Solid Waste Management (ISWM) policies, strategies and action plans with clear targets and indicators are recommended, mainstreaming waste management issues into national development planning, This should be implemented through an ISWM programme linking public health, environmental protection, privatisation, decentralisation and economic instrument policies to the needs of the solid waste sector so that they are mutually supportive. Institutional strengthening and internal capacity building are essential. Technical expertise to convert waste into new products should be transferred with the support of international donor organisations.

In mobilising investments to greening the waste sector, governments need to adopt cost recovery measures, especially those based on the Polluter Pays Principle, which would allow them to generate greater revenues and increase their budgetary allocations to the sector. International funding can be tapped into, particularly from Certified Emission Reductions and Micro-Credit Schemes to initiate recycling enterprises.

Partnerships with the private sector have the potential for reducing the fiscal pressure while enhancing efficiency of service delivery. A fiscal environment should support private sector engagement in the waste sector.

Waste avoidance can be supported by applying economic incentives such as deposit-schemes, fees on specific items and recycling credits. Raising awareness and providing education on the effects of waste should be part of dedicated initiatives as well as school curricula.

Considerable improvements have been made in the last ten to fifteen years in management of municipal solid waste (MSW) for many SIDS. In 1997, a consortium of funding institutions (World Bank, Caribbean Development Bank and the European Union) financed a comprehensive overhauling of waste



Source: UNEP, Green Economy Report, 2011.

management programmes in several countries of the Organisation of Eastern Caribbean States[34], which included initiatives to:

- improve the coverage and effectiveness of domestic solid waste collection and disposal facilities;
- assist beneficiary countries in the establishment of appropriate legal and institutional frameworks to enable effective management and disposal of shore and ship-generated waste;
- assist in the preparation of plans and programmes to address the problems of collection, treatment and disposal of liquid wastes; and
- identify opportunities for reduction, recovery and recycling of solid waste.

Several other Caribbean countries (Bahamas, Belize and Jamaica) also embarked on a similar upgrading of their policies, legislation, regulatory controls and waste infrastructure. This has resulted in very visible improvements in the collection and disposal of waste and a minimisation of the threats of environmental pollution, particularly in coastal areas.

[34] Antigua and Barbuda, Dominica, Grenada, St. Kitts and Nevis, St. Lucia and St. Vincent and the Grenadines.



CONCLUSIONS

The primary challenge for many SIDS is enhancing their prospects for economic growth, while preserving their environment and promoting social development. While there may be some concerns as to the process by which the green economy debate is proceeding, the approach offers opportunities to better manage natural resources and focus on sustainable development. It is also critical that the special circumstances of SIDS should be given consideration when various principles, policies and targets such as the transition to a green economy are being developed.

Depending on a country's development path, needs, priorities, degree of vulnerabilities, natural resources, ecosystems and the services they provide, the plans and strategies to promote a green economy might vary. In this regard, there are also important practical and political challenges, which can make the creation of some enabling conditions more or less realistic in the short to medium-term.

Enabling Conditions

Several recommendations have been presented for enabling the transition to a green economy. Primarily among those conditions is the revision of key areas of policy-making to enable the right conditions that support a green economy transition.

These areas include increasing **public investment and spending**, developing **market-based instruments,** and revising the **legislative and regulatory framework and enhancing institutional capacities.**

- In order for SIDS to create the conditions required for a transition to a green economy, the following specific measures can be considered:
- articulation of clear transitional policy instruments and the establishment of





sound regulatory frameworks;

- coordination of policies across countries (regional groups);
- identification of capacity-building requirements, including sourcing of funds to assist with and ease the transition to a green economy; and
- regional and international co-operation and support including in sharing knowledge and good practices.



Integrated planning is also very important to ensure decisions are aligned with the objectives of a green economy. For SIDS that lack financial and human resources it is imperative that funding mechanisms are developed and made operational to facilitate financial and technical assistance in promoting green activities.

The green economy concept has managed to turn the focus of the international community towards a new way to achieve sustainable development, one that is targeted at a greater involvement of the private sector, but also premised on social equity and poverty alleviation. Opportunities abound in the transition to a green economy for SIDS and a green growth road map pointing the way forward, commitment to facilitating technology transfer and financial assistance could be a useful strategy.

The risks, challenges, and opportunities, presented by the Green Economy must be carefully studied in the SIDS context given the narrow margin for error in development planning in SIDS. In this connection, for SIDS, cost-benefit analyses to ascertain the transition costs versus the costs of doing business as usual, should be undertaken. The development and implementation of a green econovmy in SIDS should be consistent with their respective current sustainable development priorities.



In June 2012, Heads of State and Government and high-level representatives met in Rio de Janeiro, Brazil, with broad participation of civil society, in the United Nations Conference on Sustainable Development (Rio + 20). They agreed on an outcome document under the title "The Future we Want". In that document governments renewed their commitment to sustainable development and to ensuring the promotion of an economically, socially and environmentally sustainable future for the planet and for present and future generations.

The leaders of the world reaffirmed that SIDS remain a special case for sustainable development in view of their unique and particular vulnerabilities. They expressed their concern that, while SIDS have progressed in the areas of gender, health, education and the environment, their overall progress towards achieving the Millennium Development Goals has been uneven.

Rio+20 called for continued and enhanced efforts to assist SIDS in implementing the Barbados Programme of Action and the Mauritius Strategy. A call was also made for a strengthening of United Nations System support to SIDS in keeping with the multiple ongoing and emerging challenges faced by these States in achieving sustainable development. UNEP and UN DESA are strongly committed to continue supporting SIDS in their relevant areas of expertise.

A call was also made for the convening in 2014 of a third international conference on SIDS, recognizing the importance of coordinated, balanced and integrated actions to address the sustainable development challenges facing them. The General Assembly was invited to determine the modalities of the conference at its sixty-seventh session.

Governments considered green economy in the context of sustainable development and poverty eradication as one of the important tools available for achieving sustainable development and states that it could provide options for policy making. They also emphasized that it should contribute to eradicating poverty as well as sustained economic growth, enhancing social inclusion, improving human welfare and creating opportunities for employment and decent work for all, while maintaining the healthy functioning of the Earth's ecosystems.

They acknowledged that green economy in the context of sustainable development and poverty eradication will enhance the ability to manage natural resources sustainably and with lower negative environmental impacts, increase resource efficiency and reduce waste. The importance of governments taking a leadership role in developing policies and strategies through an inclusive and transparent process was also underscored. And they noted the efforts of those countries, including developing countries, that have already initiated processes to prepare national green economy strategies and policies in support of sustainable development.

Governments considered that innovative financing mechanisms can make a positive contribution in assisting developing countries

to mobilize additional resources for financing for development.

Small scale fisheries and aquaculture

Rio + 20 urged the identification and mainstreaming of strategies by 2014 that further assist developing countries, in particular the least developed countries and SIDS, in developing their national capacity to conserve, sustainably manage and realize the benefits of sustainable fisheries, including through improved market access for fish products from developing countries.

Governments committed to observe the need to ensure access to fisheries and the importance of access to markets, by subsistence, small-scale and artisanal fisherfolk and women fish workers, as well as indigenous peoples and their communities, particularly in developing countries, especially SIDS.

The significant economic, social and environmental contributions of coral reefs was also recognised, in particular to islands and other coastal States, as well as the significant vulnerability of coral reefs and mangroves to impacts, including from climate change, ocean acidification, overfishing, destructive fishing practices and pollution.

Governments committed to intensify efforts to meet the 2015 target as agreed to in the Johannesburg Plan of Implementation to maintain or restore stocks to levels that can produce maximum sustainable yield on an urgent basis. They also acknowledged that illegal, unreported and unregulated fishing deprive many countries of a crucial natural resource and remain a persistent threat to their sustainable development. Therefore they recommitted to prevent, combat and eliminate these practices.

Tourism

Governments emphasized in Rio + 20 that well-designed and managed tourism can make a significant contribution to the three dimensions of sustainable development. Rio + 20 recognised the need to support sustainable tourism activities and relevant capacity building that promote environmental awareness, conserve and protect the environment, and improve the welfare and livelihoods of local communities by supporting their local economies and the human and natural environment as a whole.

Rio + 20 also encouraged the promotion of investment in sustainable tourism, including eco-tourism and cultural tourism, which may include creating small and medium sized enterprises and facilitating access to finance, including through microcredit initiatives for the poor, indigenous peoples and local communities in areas with high eco-tourism potential.

Water

Governments committed in Rio + 20 to the progressive realization of access to safe and affordable drinking water and basic sanitation for all, as necessary for poverty eradication, and to significantly improve the implementation of integrated water resource management at all levels as appropriate.

The key role that ecosystems play in maintaining water quantity and quality and support actions within respective national boundaries to protect and sustainably manage these ecosystems was also recognised. Governments underlined the need to adopt measures to address floods, droughts and water scarcity, addressing the balance between water supply and demand, including, where appropriate, non-conventional water resources, and to mobilize financial resources and investment in infrastructure for water and sanitation services, in accordance with national priorities.

Rio + 20 stressed the need to adopt measures to significantly reduce water pollution and increase water quality, significantly improve wastewater treatment and water efficiency and reduce water losses.

Energy

There was recognition in Rio + 20 that improving energy efficiency, increasing the share of renewable energy and cleaner and energy-efficient technologies are important for sustainable development, including in addressing climate change. It was also recognised that energy plays a critical role in the development process, as access to sustainable modern energy services contributes to poverty eradication, saves lives, improves health and helps provide for basic human needs. Emphasis was given to the need to address the challenge of access to sustainable modern energy services for all, in particular for the poor, who are unable to afford these services even when they are available.

Governments reaffirmed support to the use of an appropriate energy mix to meet developmental needs, including through increased use of renewable energy sources and other low-emission technologies, the more efficient



UN Photo/Martine Perret

use of energy, greater reliance on advanced energy technologies, including cleaner fossil fuel technologies, and the sustainable use of traditional energy resources. They thus committed to promoting sustainable modern energy services for all through national and subnational efforts, inter alia, on electrification and dissemination of sustainable cooking and heating solutions, including through collaborative actions to share best practices and adopt policies, as appropriate. The creation of enabling environments that facilitate public and private sector investment in relevant and needed cleaner energy technologies was urged.

Governments recognised that improving energy efficiency, increasing the share of renewable energy and cleaner and energy-efficient technologies are important for sustainable development, including in addressing climate change. They also recognised the importance of promoting incentives in favour of, and removing disincentives to, energy efficiency and the diversification of the energy mix, including promoting research and development in all countries, including developing countries.

Waste Management

Governments called for the effective implementation and strengthening of the Strategic Approach to International Waste Management as part of a robust, coherent, effective and efficient system for the sound management of chemicals throughout their life cycle, including to respond to emerging challenges.

Governments commended existing public-private partnerships and called for continued, new and innovative public-private partnerships among industry, governments, academia and other non-governmental stakeholders aiming to enhance capacity and technology for environmentally waste management, including for waste prevention.

Governments showed themselves concerned that many countries, in particular the least developed countries, lack the capacity for sound management of chemicals and waste throughout their life cycles. They emphasized that additional efforts are needed to enhance work towards strengthening capacities, including through partnerships, technical assistance and improved governance structures. They called for the development and enforcement of comprehensive national and local waste management policies, strategies, laws and regulations.

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- United Nations Department of Economic and Social Affairs
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