Integrating Sustainable Development into National Frameworks

Policy Approaches for Key Sectors in Small States

Edited by Janet Strachan and Constance Vigilance

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Abbreviations and acronyms

ACP	African, Caribbean and Pacific Group of States
ADB	Asian Development Bank
AIMS	Atlantic, Indian Ocean, Mediterranean and South China Seas
bbl	oil barrel
bpd	barrels per day
BPOA	Barbados Programme of Action
CARICOM	Caribbean Community and Common Market
CDMs	Clean Development Mechanisms
CERs	Certified Emissions Reductions
CITES	Convention on International Trade of Endangered Species
CHARM	Comprehensive Hazard and Risk Management
COI	Indian Ocean Commission (Commission de l'Océan Indien)
CROP	Council of Regional Organisations in the Pacific
CSO	civil society organisations
DDA	Doha Development Agenda (of the WTO)
DRR	Disaster Risk Reduction
EBA	Everything But Arms
EBM	ecosystem-based management
EC	European Commission
EEBC	Energy Efficiency Building Codes
EEZ	exclusive economic zone
EE&C	energy efficiency and conservation
EPA	Economic Partnership Agreement
ESCOs	energy saving companies
EU	European Union
EU WF	European Union Water Facility
FDI	foreign direct investment
FFA	(South Pacific) Forum Fisheries Agency
FICs	Pacific Islands Forum countries (Forum island countries)
FSM	Federated States of Micronesia
FTA	free trade agreement
GATS	WTO General Agreement on Trade in Services
GDP	gross domestic product
GEF	Global Environment Fund or Global Environment Facility
GHG	greenhouse gases

GSP+	Generalised System of Preferences Plus
GW	gigawatt
GWP	Global Water Partnership
HDI	Human Development Index
HFA	Hyogo Framework for Action
IADB	Inter-American Development Bank
IEPAs	Interim Economic Partnership Agreements
IFRC	International Federation of Red Cross and Red Crescent Societies
IPCC	Intergovernmental Panel on Climate Change
IWRM	integrated water resources management
IUCN	International Union for the Conservation of Nature and Natural Resources
JPOI	Johannesburg Plan of Implementation
kW	kilowatt
kWh	kilowatt-hour
LDCs	least developed countries
MDGs	Millennium Development Goals
MSI	Mauritius Strategy for Implementation (of Barbados Programme of Action)
Mmbtu	one million British thermal units
MW	megawatt
NAPAs	National Action Plans for Adaptation, also National Adaption Programmes of Action
NEDO	New Energy and Industrial Technology Development Organization (Japan)
NEMS	National Environmental Management Strategies
NGO	non-governmental organisation
NSDS	national sustainable development strategy (or strategies)
OECS	Organization of Eastern Caribbean States
OECD (DAC)	Organisation for Economic Co-operation and Development (Development Assistance Committee)
PACER Plus	Pacific Agreement on Closer Economic Relations
Pacific RAP	Pacific Regional Action Plan on Sustainable Water Management
PACPs	Pacific ACP (African, Caribbean and Pacific Group of States) countries
PCJ	Petroleum Corporation of Jamaica
PIC	Pacific island country
PICTA	Pacific Island Countries Trade Agreement
PIFS	Pacific Islands Forum Secretariat
PIROP	Pacific Islands Regional Oceans Policy
PNG	Papua New Guinea
ppm	parts per million
PV	photovoltaic
RET	renewable energy technology(ies)
ROOs	rules of origin
SIDS	small island developing states
SOPAC	South Pacific (or Pacific Islands) Applied Geoscience Commission

SPARTECA	South Pacific Regional Trade and Economic Co-operation Agreement
SPC	South Pacific Commission, also Secretariat of the Pacific Community
SPREP	South Pacific Regional Environment Programme
SWH	solar water heater/heating
UNDESA	United Nations Department for Economic and Social Affairs
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	UN Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UN/ISDR	UN International Strategy for Disaster Reduction
UNWTO	United Nations World Tourism Organization
USVI	US Virgin Islands
WSP	Pacific Water Supplies Plans Programme
WTE	waste-to-energy (technologies)
WTI	West Texas Intermediate (oil)
WUE	water use efficiency
WHO	World Health Organization
WSSD	World Summit on Sustainable Development
WTO	World Tourism Organization (also World Trade Organization)
WTTC	World Travel and Tourism Council

Useful Websites

Action Aid International: http://www.actionaid.org

Africa, Caribbean and Pacific (ACP) Secretariat: http://www.acpsec.org

American Red Cross Prepare.org: http://www.prepare.org

Association for Water and Rural Development (AWARD): http://www.award.org.za

CARE International: http://www.care.org

Caribbean Community: http://www.caricom.org

Caribbean Disaster Emergency Management Agency (CDEMA): http://www.cdera.org

Centre for Excellence in Disaster Management and Humanitarian Assistance: http://www.coe-dmha.org

Centre for Research on the Epidemiology of Disasters (CRED): http://www.cred.be

Commission de l'Océan Indien (Indian Ocean Commission): http://www.coi-ioc.org

Commonwealth Secretariat: http://www.thecommonwealth.org

Disaster Emergency Needs Assessment: http://www.ifrc.org/Docs/pubs/disasters/resources/corner/dp-manual/Disemnas.pdf

Earthquake Engineering Research Institute: http://www.eeri.org

Famine Early Warning Systems Network: http://www.fews.net

Federal Emergency Management Agency for Kids: http://www.fema.gov/kids

Foundation of the Peoples of the South Pacific International: http://www.fspi.org.fj

G8 Commission: http://www.g8.utoronto.ca/governmental

Global Mechanism UNCCD: http://www.unep.org/AfricanCaribbeanPacific/MEAs/UNCCDGlobalMechanism/index.asp

Grassroots Organizations Operating Together in Sisterhood (GROOTS): http://www.groots.org

Inter-Agency Standing Committee (IASC): http://www.humanitarianinfo.org/iasc/gender

Institute of Development Studies: http://www.ids.ac.uk

International Food Policy Research Institute: http://www.ifpri.org

International Institute for Environment and Development: http://www.iied.org

International Federation of Red Cross and Red Crescent Societies: http://www.ifrc.org/what/disasters/index.asp

International Tsunami Information Center: http://www.geophys.washington.edu/tsunami/general/warning/itic.html

International Youth Federation: http://www.iyfnet.org

Microfinance Gateway: http://www.microfinancegateway.org

Oxfam: http://www.oxfam.org.uk

Pacific Islands Applied Geoscience Commission (SOPAC) http://www.sopac.org

PreventionWeb: http://www.preventionweb.net/english

ProVention Consortium: http://www.proventionconsortium.org

Reuters Foundation Alert: http://www.alertnet.org

Save The Children: http://www.savethechildren.org

Small Island Developing States (SIDS) Network: http://www.sidsnet.org

Secretariat of the Pacific Regional Environment Programme: http://www.sprep.org

Strategies for Advancing Girls' Education (SAGE): http://sage.aed.org

United Nations (UN): http://www.un.org

United Nations Children's Fund (UNICEF): http://www.unicef.org

United Nations Development Fund for Women (UNIFEM): http://www.unifem.org

United Nations Development Programme (UNDP): http://www.undp.org

United Nations Educational, Scientific and Cultural Organization (UNESCO): http://www.unesco.org

United Nations Environment Programme (UNEP): http://www.unep.org

UNEP/SIDS: http://islands.unep.ch

United Nations Food and Agricultural Organization (FAO): http://www.fao.org

United Nations Human Settlement Programme (UN-HABITAT): http://www.unhabitat.org

United Nations International Strategy for Disaster Reduction (UN/ISDR): http://www.unisdr.org

UN/ISDR 2005 Hyogo Framework for Action (HFA): http://www.unisdr.org/eng/hfa/hfa.htm

United Nations Joint Programme on HIV/AIDS (UNAIDS): http://unaids.org

US Agency for International Development (USAID): http://www.usaid.gov

Women's Environment and Development Organisation (WEDO): http://www.wedo.org

World Bank: http://www.worldbank.org

International Union for the Conservation of Nature: http://www.iucn.org

World Health Organization (WHO): http://www.who.int

World Meteorological Organization (WMO): http://www.wmo.ch

World Vision International: http://www.wvi.org

World Wildlife Fund (WWF): http://www.wwf.org

Chapter 1

Janet Strachan and Constance Vigilance

Introduction

> *Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.*
> Brundtland Commission Report, *Our Common Future*
>
> *Human beings are at the centre of concerns of sustainable development. They are entitled to a healthy and productive life in harmony with nature.*
> Principle 1 of the Rio Declaration

The idea of human responsibility for sustaining our natural environment goes back a long way, but often gets pushed into the shadows. More than ever today, development that respects the value of the natural environment is necessary, especially for those beset by poverty and whose natural resources are being degraded by the adverse impact of current patterns of economic and social activity and lack of protection from natural disasters.

This book, the latest in a series from the Commonwealth addressing issues of sustainable development for small states and islands, is about bringing policies and programmes for sustainable development from the shadows into the mainstream of decision-making at all levels of governance and in all sectors. The overall theme of this book came from brainstorming sessions of a consultative group consisting of the Commonwealth Secretariat, the Pacific Islands Forum Secretariat (PIFS), the Caribbean Community Secretariat (CARICOM) and Indian Ocean Commission, as well as representatives from the United Nations Department for Economic and Social Affairs (UNDESA) and from small island developing states (SIDS) themselves.

The thrust of this book is to bring thematic areas of action towards sustainable development in small island developing states, which were set out in the 2005 Mauritius Strategy for Implementation (MSI),[1] into the mainstream of national action by public and private sectors and non-governmental organisations (NGOs). Through this mainstreaming, sustainable development concerns in key sectors will be integrated within the normal processes of planning, institutional and human capital development, finance and political and operational management processes. This means that national budgets will address the thematic areas of the MSI, including identifiable actions to be taken and having a formal political reporting mechanism for tracking progress. This concept contrasts with the traditional manner of sidelining themes for action to particular ministries, or sectors making extra effort during crises.

The publication is designed as a handbook to assist practitioners currently engaged in policy-making and management of development activities in small and island states. It covers eight of the twenty issues that have been outlined in the Mauritius Strategy as being important for the sustainable development of SIDS – disaster management, marine resources, freshwater resources, land resources, energy resources, tourism resources and trade. The publication brings together best practices, policy options and development prospects that small states can actively pursue in order to achieve real progress in these fields. The text also covers the progress and experiences of

countries in the Caribbean, Pacific and the Atlantic Indian Mediterranean States (AIMS) regions in their implementation of sustainable development in these areas. Further, the publication fills the gap in the literature on sustainable development and provides a useful point of reference and stimulus to policy-makers and their supporting colleagues from all sectors.

This introduction summarises the main themes and conclusions of the chapters of this book and provides insights into the key drivers of sustainable development at the international level through the Commonwealth and the United Nations, as well as at the national level through national sustainable development strategies.

About the chapters

The chapters of this publication explore the principal ways in which sustainable development concerns are being integrated within the areas of disaster management, marine resources, freshwater resources, land resources, energy resources, tourism resources and trade.

Mainstreaming in this text is addressed from various angles. The first chapter looks at mainstreaming in terms of the development of national sustainable development councils and strategies. The chapter on disaster management looks at countries and regions addressing the key areas of the Hyogo Framework for Action (HFA) on disaster risk reduction and disaster management. For ocean and marine resources, mainstreaming is better addressed through regional frameworks and an ecosystem-based management approach at the national level. With regards to water resources, the importance of the regional role, as well as international advice and finance, is essential in mainstreaming this area, given national capacity constraints in many small states. Consultation with all stakeholders is an essential element in mainstreaming sustainable development of land use resources. Renewable energy and energy efficiency can be mainstreamed through a number of areas including fiscal policies and public and professional education. Tourism resources can be mainstreamed through the implementation of a number of standards, including Green Globe standards and ISO 14000 environmental management standards. Regional agreements and regional approaches in trade are essential to address sustainable development concerns in this area.

Chapter 2 by Saki Hirano recounts the adaptation of the principles of sustainable development through the formulation of national strategies in SIDS. It provides a wide-ranging picture of the problems and the progress made. She emphasises that such strategies should be seen as 'living documents', which are the outcome of a continual iterative engagement of all sectors. SIDS vary markedly in their needs and opportunities for development. One strategic solution does not fit the needs of all small states and SIDS, despite the problems they have in common. These problems arise from their small size, limited resources, weak institutional capacity, small markets, openness, dependence on imports, remoteness, fragmentation of communities, and their economic and environmental vulnerability to external shocks. Nonetheless, such countries also differ in many ways, not least in their local political and social culture, their leadership, their perceived priorities, their capacity for effective responses, and their commitment to independence in governance. Thus, viable strategies are adapted to local circumstances and emerge from a local process, influenced but not determined by external ideas and forces.

Hirano puts special emphasis on the value of intergovernmental regional institutions in supplementing national weaknesses in development capacity. She cites, for example, the role of the Pacific Forum in promoting national processes of strategic development in the widely dispersed SIDS of that region.

She identifies two vehicles for national strategic support: national commissions or councils for formulating and implementing strategies. However, she recognises that even if established, without effective leadership and real teeth, these bodies can become ineffective and marginalised in the national political process. She stresses the importance of specially adapting international indicator systems, such as the Millennium Development Goals (MDGs), for monitoring national progress in SIDS in order to meet their peculiar needs.

Chapter 3 on disaster risk reduction and adaptation to climate change, by Rowena Hay, Chris Hartnady and Dylan Blake, covers the process of policy and programme response to the implementation of the Hyogo Framework for Action (HFA) on disaster risk reduction across the three SIDS regions.

The Pacific islands have developed Comprehensive Hazard and Risk Management (CHARM) with a strong focus on dialogue between policy-makers and scientists for the protection of water resources against the impacts of climate change.

The Caribbean has the Caribbean Hazard Mitigation Capacity Building Programme (CHAMP). This gives special attention to critical public infrastructures, using hazard mapping and the process of Probable Maximum Risk Assessment. These reviews are used as a basis for planned investment in prevention to secure vital services such as power generation, water and sanitation, waste management, transport, government buildings, emergency services, education, social and health services. The assessments then lead to investment programmes to reduce risks and provide planned response through public and private partnership and insurance. The Caribbean region is adopting a 'no regrets' risk reduction approach, which features action on high priority areas, especially flood preparedness and water security.

The Indian Ocean offers examples of the National Adaptation Programme of Action in Least Developed Countries (LDCs) such as the Comoros islands, as well as the policies of private sector 'pay to preserve' and 'willingness to pay' for reduced risk and protection being developed in Mauritius.

The chapter asserts that the increasing risk of natural disasters arising from climate change will not only carry costs through damage to life and property, but will have an increased adverse impact on developing countries, by diverting resources otherwise invested in economic and social development programmes, to hazard mitigation. Nonetheless, it reassuringly cites World Bank sources on the cost-effectiveness of disaster risk reduction methods in saving life and the protection of property.

The authors observe that development practices in SIDS have themselves increased the risks of natural disasters, making coastlines more vulnerable to erosion, by eradicating mangroves and by urban-style development on coastal plains and wetlands. This has destroyed habitats that would have provided some natural protection against climate variation, sea level rise and increases in the frequency and severity of natural hazards such as storms, sea surges and flooding.

The chapter emphasises the importance of strategic flexibility in disaster risk management, which should embrace assessment, prevention, preparedness, response and recovery, in specific relation to the most vulnerable people and property. While the protection of water resources is a key issue for all SIDS, the chapter provides a comprehensive multi-sector table identifying appropriate areas for action for each of the principal elements in the Hyogo Framework of Action.

Chapter 4 by Padma Lal outlines the challenges faced by Pacific islands in managing ocean and marine resources and the solutions that can be had through ecosystem-based management. The vast coastal and marine resources of the Pacific are a source of subsistence, as well as commercial

activities. The large exclusive economic zones (EEZs) and very high sea to land ratio means coastal and marine resources are the main source of gross domestic resources for all Pacific countries. In addition to the same challenges as other small states, Pacific island countries face further challenges of poor transport and communication infrastructure, because of the many islands scattered across the large sea. The sustainable development issues concerning ocean and marine resources are how to ensure economic livelihoods from these resources, while at the same time conserving biodiversity and natural ecosystems.

The chapter shows that challenges are experienced with overfishing, including with regard to the sustainability of tuna resources, and that there are threats to the coral reefs and other habitats from coral bleaching and wind and wave actions caused by extreme weather events.

The management of ocean and marine resources is being carried out both at a national and regional level in the Pacific. At the national level, management of these issues has often been sectoral in nature, using a top-down regulatory approach. Regional agencies, such as the Forum Fisheries Agency and the Secretariat of the Pacific Community, have played a major role in the region. Support at the regional level has focused on research, capacity development and developing regional strategies. Regional strategies include those envisioned by the Pacific Regional Plan.

The chapter also shows that Pacific island countries are using ecosystem-based management that integrates biological, social and economic factors into a comprehensive strategy aimed at protecting and enhancing sustainability, diversity and productivity of the region's natural resources.

Chapter 5 on sustainable water management by Marc Overmars and Allison Woodruff begins with the examination of the principal thematic issues of sustainable development in small states and islands by exploring water resources. They underline the advantage of a regional process for promoting better water and sanitation services, using the progress made in the Pacific region as a model. They also attribute sustained progress to improvements in strategy and co-ordination promoted by support from UN agencies, such as the United Nations Environment Programme (UNEP) and World Health Organisation (WHO), the UN Commission for Sustainable Development, Global Environment Fund (GEF) funding and bilateral aid from developed countries in the region.

The chapter stresses the importance of sound water and sanitation services as a necessary condition for social and economic development, poverty alleviation and environmental security. Islands present special problems for the development of these services. They have poor natural storage (especially on the atolls), vulnerability to saline intrusion and sea level rise, with intense competition for land use and often-complex systems of land rights. Management of wastewater and industrial discharge on SIDS is constrained by their small land areas. Moreover, many islands lack the technical capacity to build up the necessary institutional, human and financial support on which integrated development depends.

The chapter explores the reliability and robustness of indicators of service provision, technical definitions for national reporting and standards of measurement and implications for reporting progress.

The chapter strongly promotes the importance of the regional role, international advice and finance, and the bilateral support from developed countries in the Pacific region, notably Australia and New Zealand, as being essential features for achieving sustained development in this technical field.

Chapter 6 by Padma Lal looks at land use, with specific emphasis on agriculture. She notes that access to land is limited not only because of the limited endowments in many small islands, but also because of institutional constraints. In the Pacific, a dual system of traditional communal land and landownership exists. In national assessments carried out for the World Summit on Sustainable Development, many countries acknowledged that they have limited capacity to implement land management. She posits that each country should have to define its own solution to land issues, based on common principles that are sensitive to local customs.

Due to the varying nature of Pacific islands land, from the relatively large Melanesian islands to the land-poor atolls, the chapter shows that agricultural sector challenges in the Pacific are multi-faceted. The chapter also demonstrates that to realise its agricultural potential, each country's agricultural sector planning and development needs to be integral to its national development efforts, as well as to reflect an ecosystem-based management approach. This requires knowledge, foresight and innovation.

Chapter 7, by David Barrett, examines renewable energy options and energy efficiency goals for small states, as part of a strategy for promoting energy security and environmental protection. Progress has been mixed, with progress being made mainly in large countries such as Japan and Cuba. There has also been some progress in a few small states, such as Jamaica.

Small states tend to lag behind in the use of renewable energy and in exercising energy efficiency goals, despite their heavy dependence on fossil fuel imports and opportunities for exploitation of available renewable sources such as solar, biomass, hydro, geothermal, wind and even ocean thermal energy. Barrett stresses the inhibitions to such developments in small states, which arise from lack of political leadership, a shortage of technical expertise, the need for reform of administrative and financial systems, and an inertia in public sector utilities, favouring the status quo rather than research and development.

The chapter identifies examples of best practice emerging in certain Pacific islands and in the Caribbean, and prescribes the need for a route map for development and a menu of factors to promote progress. These include reforms of fiscal policies and accounting methods to favour the substitution of renewable energy sources and new technology in existing installations, public and professional education, mandatory building codes for increasing energy efficiency, emissions trading, regional technical development support, and triple bottom line evaluation methods (embracing trading balances with transparent presentation of the social and environmental impact).

Chapter 8, by Deirdre Shurland, identifies the principles for mainstreaming tourism as part of sustainable development in small states. The chapter notes the global upward trend in tourism, which promotes increasing employment, income and investment in the sector, while at the same time adding to pressures on the vulnerable environmental quality in small states upon which much of that tourism depends. In particular, such growth creates increased demand for coastal land, water resources, energy, waste management and stress on preservation of indigenous natural and cultural resources.

Through the Mauritius Strategy, small states have become engaged in initiatives to promote a more sustainable approach to tourism, with long-term strategies embracing environmental, economic and social dimensions. These strategies have in some cases adopted quality management models. The author proposes the adoption of a Japanese car manufacturing quality model, to provide one framework for assessment of plans for improving the tourism sector within the mainstream of macro economic and social planning. Other examples used include the adoption of quality

models through accreditation schemes, such as the European Union (EU) Blue Flag scheme and the UN Educational, Scientific and Cultural Organization (UNESCO) heritage sites programme. Complementary quality mechanisms cited in the chapter include tourism zoning, tax incentives for achievement of conservation standards, and the establishment of multi-sector task forces or standing committees for planning and implementation of sustainable tourism strategies.

Chapter 9 Veniana Qalo and Derrick Akintade examine the integration of labour and fisheries into trade agreements by the countries in the Pacific region. With high youth unemployment and a high level of population growth, as well as the vast Pacific Ocean, labour and fisheries are prime areas for trade agreements between the Pacific small states and other countries. As with other small states, Pacific countries experienced an erosion of trade preferences to developed markets and thus a decline in the value and quantity of goods traded. The chapter cites three free trade frameworks as being relevant to Pacific SIDS – the agreement between Pacific Forum island countries and Australia and New Zealand under the Pacific Agreement on Closer Economic Relations (PACER Plus); the free trade area agreement among the 14 SIDS in the region, referred to as the Pacific Island Countries Trade Agreement (PICTA); and the Economic Partnership Agreement (EPA) negotiations between the 14 SIDS and the European Union. The Pacific Plan also endorses a number of areas where regional co-operation and action on trade-related matters is deemed to warrant priority attention.

Remittances are a large percentage of gross domestic product (GDP) for many countries within the Pacific region. The chapter shows that many Pacific countries are advocating labour mobility arrangements, such as the Tuvalu and Kiribati seafarer's schemes. In 2006, the New Zealand government launched the Regional Seasonal Employment Scheme, which allows for the employment of unskilled workers from Kiribati, Samoa, Tonga, Tuvalu and Vanuatu. The chapter also examines the feasibility of caregivers from Solomon Islands working in Canada.

In terms of fisheries and economic integration in the Pacific, the authors examine the importance of fisheries to the Pacific region, an industry that is worth approximately US$3 billion annually. Sustainability of existing stocks and species has recently become an important issue, especially given declining stocks of certain species of fish, such as tuna. A number of countries from outside of the region pay access fees to Pacific SIDS to fish within their EEZs.

The chapter outlines a number of the challenges that remain in the areas of labour and fisheries. The authors show that for temporary migration schemes to be successful, there will need to be strong, transparent and enforceable criteria and regulations. In the case of fisheries, the authors identify one of the essential keys to success as being an ecological approach to fisheries management.

The Commonwealth and small states

The Commonwealth Secretariat, with more than a third of its members classified as small states, has been strongly committed to policy support and advocacy for these countries. The issue of the vulnerability of small states was first given formal expression at the 1977 Commonwealth Finance Ministers Meeting in Barbados. Having noted the special characteristics of small states – in particular, their reliance on trade, high dependence on capital inflows and, in some cases, their lack of natural resources – the ministers urged the international community to adopt a more flexible approach to the requirements of these countries, as well as special measures to assist them. In response, the Secretariat designed a programme to assist small states in overcoming 'the disadvantages of small size, isolation and scarce resources which severely limit the capacity of such countries to achieve their development objectives or to pursue their national interests in a wider international context'.

Commonwealth leaders meeting in New Delhi in 1983 expressed their belief that the problems of small states 'deserved consideration on a wider basis, including that of national security'. A Commonwealth Consultative Group was thus commissioned to carry out such an examination. Its report, *Vulnerability: Small States in the Global Society,* published in 1985, was the first to highlight the inherent vulnerability of small states to external interference. In reasserting the vulnerability of and threats to small states, and outlining economic and foreign policy measures to mitigate these, the report was important in raising the political profile of small states in international forums.

Following this publication, the Ministerial Group on Small States was formed to continue the discussion of issues of importance to small states. At their second meeting in 1995, ministers recognised that the international context faced by small states had changed dramatically since the end of the Cold War. This led to the creation of a Commonwealth advisory group of eminent persons, whose report, *A Future for Small States: Overcoming Vulnerability,* was published in 1997.

In 2000, the seminal report of the Commonwealth Secretariat/World Bank Joint Task Force on Small States, *Small States: Meeting Challenges in the Global Economy,* concluded that small states required effective domestic policy, regional co-operation, assistance from multilateral and bilateral development institutions, and improvement in the external environment to support their development. It highlighted four areas of special relevance to successful development in small states: tackling volatility, vulnerability and natural disasters; transitioning to the changing global trade regime; strengthening capacity; and benefiting from the opportunities and coping with the challenges of globalisation. It also recommended an Annual Small States Forum, where international donors report on their activities in small states. Small states have garnered additional support and attention from international donors as a result, but more remains to be done: a 2005/06 review of the Task Force report established that small states are still vulnerable and continue to face a number of development challenges associated with their size.

The Mauritius Strategy

The characteristics that shape the sustainable development concerns of small island developing states (SIDS) were recognised in 1992 by the international community when it agreed Chapter 17 of Agenda 21 – one of the key outcomes from the Rio Earth Summit. Agenda 21 notes that SIDS face special challenges in planning for sustainable development, and agreed a Global Conference on the Sustainable Development of Small Island Developing States. This conference took place in Barbados in 1994 and adopted the Barbados Programme of Action (BPOA), which is the principal international framework for addressing the special challenges and constraints faced by small island developing states in their implementation of sustainable development. The BPOA addresses 14 major themes, ranging from climate change through coastal and marine resources to tourism and human resources development.

A ten-year comprehensive review of the implementation of the Barbados Programme of Action took place in Mauritius in January 2005. The summit involved about 2,000 participants, including 18 presidents, vice-presidents and prime ministers, the UN Secretary-General, and around 60 ministers, and representatives of UN agencies and intergovernmental organisations. This international meeting led to the adoption in January 2005 of the Mauritius Strategy for the Further Implementation of the Barbados Programme of Action for the Sustainable Development of SIDS, which includes 20 thematic areas such as climate change and sea level rise, natural and environmental disasters, and energy resources.[2] The Mauritius Strategy notes that for successful implementation, SIDS require effective human, institutional and technical capacity development; effective

monitoring and co-ordination, including through SIDS regional organisations; and support of the international community, particularly through financial and technical backing. The meeting also adopted the Mauritius Declaration, a political statement which reaffirms the continuing validity of the Barbados Programme of Action, adopts the Mauritius Strategy and makes a commitment to its timely implementation.

National sustainable development strategies

The Brundtland Commission notes that economic growth, social equity and protection of the environment are the three principal components of sustainable development. The complex relationships between these three principal elements are at the heart of operationalising sustainable development. For example, economic growth must take place without compromising the natural environment and creating negative social consequences. Mitigating negative impacts and establishing trade-offs are therefore essential to the implementation of national sustainable development strategies. As a result, sustainable development strategies involve far reaching policy and institutional reforms, as well as the involvement of all sectors. Such strategies involve dealing with immediate concerns, while at the same time addressing long-term issues. UNDESA defines sustainable development strategies as 'a co-ordinated, participatory and iterative process of thoughts and actions to achieve economic, environmental and social objectives in a balanced and integrated manner at the national and local levels. The process encompasses situation analysis, formulation of policies and action plans, implementation, monitoring and regular review. It is a cyclical and interactive process of planning, participation and action in which the emphasis is on managing progress towards sustainability goals rather than producing a "plan" as the end product'.

From the experiences of developing and developed countries, UNDESA[3] concludes that the underlying principles of effective national sustainable development strategies include:

- Country ownership and commitment
- Integrated economic, social and environmental objectives across sectors, territories and generations
- Broad participation and effective partnerships
- Capacity development and an enabling environment and
- Outcomes and means of implementation focus

Ensuring sustainable development requires four critical processes to harness the skills, values and energies of countries. These processes – political, participatory, technical and resource mobilisation – have in common the need to involve the key stakeholders and the need to focus on major issues. As with any strategy, the avenue to success is to have an implementation strategy as well as monitoring and evaluation. This would include clarifying respective roles and responsibilities, public communications, assessments, institutional reflections and learning. An added element of the implementation strategy for national sustainable development is the role of the international community in the successful implementation of sustainable development in small island developing states. The role of the institutions and bilateral donors that form this community includes technical and advisory support, and especially resource mobilisation. This is because a lack of financial resources is often identified as one of the greatest impediments to the successful implementation of sustainable development.

After reading the chapters of this book, policy-makers in small states will have been provided with significant signposts, such as the essential standards required for sustainable tourism and the

importance of regional agreements in assisting small states on the path to achieving sustainable development.

Notes

1. The Mauritius Strategy for the further implementation of the Barbados Programme of Action for the sustainable development of small island development states was agreed by the international community in January 2005.
2. The complete list of the 20 thematic areas included in the Mauritius Strategy is as follows:
   i. Climate change and sea level rise
   ii. Natural and environmental disasters
   iii. Management of wastes
   iv. Coastal and marine resources
   v. Freshwater resources
   vi. Land resources
   vii. Energy resources
   viii. Tourism resources
   ix. Biodiversity resources
   x. Transportation and communication
   xi. Science and technology
   xii. Graduation from least developed country status
   xiii. Trade: globalisation and trade liberalisation
   xiv. Sustainable capacity development and education for sustainable development
   xv. Sustainable production and consumption
   xvi. National and regional enabling environments
   xvii. Health
   xviii. Knowledge management and information for decision-making
   xix. Culture
   xx. Implementation
3. United Nations Department for Economic and Social Affairs (UNDESA) Guidance in preparing a national sustainable development strategy: managing sustainable development in the new millennium. Background Paper No. 13 – DESA/DSD/PC2/BP13.

Saki Hirano

Chapter 2

National Sustainable Development Strategies in Small Island Developing States: An Overview[1]

The first call for national sustainable development strategies (NSDS) was made at the United Nations Conference on Environment and Development (Earth Summit) in Rio de Janeiro in 1992. Chapter 8 of Agenda 21, the landmark document that came out of the conference, states for countries to adopt a national strategy for sustainable development which 'should build upon and harmonise the various sectoral economic, social and environmental policies and plans that are operating in the country… Its goals should be to ensure socially responsible economic development while protecting the resource base and the environment for the benefit of future generations'.[2]

The Barbados Programme of Action (BPOA), adopted at the Global Conference on the Sustainable Development of Small Island Developing States (SIDS) in 1994, indicates that SIDS present special challenges to planning for and implementing sustainable development because of their limited development options.[3] Given the limited resources faced by many SIDS, BPOA stressed the importance of regional and subregional co-operative programmes in meeting the challenges of sustainable development.[4]

At the five-year review of Agenda 21 in 1997, the Special Session of the General Assembly reaffirmed the importance of NSDS as a mechanism for enhancing and linking national capacity to bring together priorities in social, economic and environmental policies.[5] The outcome document set a target date of 2002 for the formulation and elaboration of national sustainable development strategies.

Another target was set at the World Summit on Sustainable Development (WSSD) held in 2002, whereby the Johannesburg Plan of Implementation (JPOI) adopted by governments urges countries to take immediate steps to make progress in the formulation and elaboration of national strategies for sustainable development and to start their implementation by 2005.[6]

At the International Meeting to Review Implementation of the BPOA held in Mauritius in January 2005, states reiterated that the BPOA remains the blueprint for the sustainable development of SIDS and for the international community to support SIDS in developing and implementing NSDS by 2005. In October of the same year, at the Pacific Regional Meeting to follow up on the Mauritius Strategy, the importance of a national sustainable development enabling environment was emphasised, especially the need for implementation to be driven and co-ordinated at the national level.

For the Caribbean SIDS, the Plan of Action for the Sustainable Development of the Americas, adopted by the governments participating in the Summit of the Americas on Sustainable

Development in 1996, explicitly states the need to integrate economic, social and environmental elements towards sustainable development. In 1999, the ministers of environment of the countries of the Organization of Eastern Caribbean States (OECS) requested the OECS Secretariat to develop a regional strategy as a framework for environmental management in the sub-region. One of the 21 principles contained in the St George's Declaration of Principles for Environmental Sustainability in the OECS, adopted in April 2001, states that all local, national and regional development policies and plans will be fully integrated to include environmental, social, cultural and economic factors which affect the small island systems of the region.[7]

In October 2005, the Pacific Island Forum Leaders met and adopted The Pacific Plan, a regional plan with a focus on stimulating and enhancing economic growth, sustainable development, good governance and security for Pacific countries through regional integration. The Plan called for all member countries to develop and implement NSDS by the end of 2008, using appropriate cross-cutting and Pacific-relevant indicators.[8]

A sustainable development strategy is defined as a co-ordinated, participatory and iterative process of thoughts and actions to achieve economic, environmental and social objectives in a balanced and integrated manner at the national and local levels. The process encompasses situation analysis, formulation of policies and action plans, implementation, monitoring and regular review. It is a cyclical and interactive process of planning, participation and action in which the emphasis is on managing progress towards sustainability goals, rather than producing a 'plan' as an end product.[9]

There is no one approach or formula that fits all countries. Countries develop strategic approaches for the preparation, development and implementation of NSDS, according to their own individual needs, priorities and resources available. A NSDS does not have to be a new document – established frameworks such as a National Vision, National Agenda 21 or a Poverty Reduction Strategy can all provide a good basis for strategic action towards sustainable development. The particular label applied to a national sustainable development strategy is not important, as long as the common characteristics of the strategy are adhered to.

Why are NSDS important and how are they different from other strategies or plans? A NSDS is important because it is an integrative and comprehensive strategy. Sustainable development issues are rarely sectoral. They are often multidisciplinary in nature, and a NSDS is able to address complex dynamics for sustainable development issues that require an integrated analysis and solutions. NSDS are also important because the process is participatory – a broad range of stake-holders, including civil society and the private sector, participate in the design, formulation and implementation of the strategy.

A NSDS defines the long-term vision and foundation of values for the country and specifies the policy instruments, tools and processes that are necessary to implement the change process. A NSDS is not a goal in itself. Rather, the strategy should be a living document that will need continuous monitoring and evaluation.

The concept of sustainable development is not new in many SIDS. They have long been aware of their small size, limited resources, remoteness from global markets, and environmental and economic vulnerability. Even before the Earth Summit in 1992, with the adoption of Agenda 21 and the widespread international acceptance of the concept of sustainable development, many SIDS had begun to seriously look at their development options. The Conference on the Human Environment in the South Pacific, held in June 1982, decided to establish the South Pacific Regional Environment Programme (SPREP) to promote sustainable development in the Pacific region. St

Kitts and Nevis has considered sustainable development issues to be a government priority since 1987, with the passing of the National Conservation and Environmental Protection Act. Other countries, such as Papua New Guinea, took initiatives following the Earth Summit to streamline existing national programmes and policies in alignment with NSDS elements and priorities.

Since then, there has been considerable progress in many SIDS countries in terms of their pushing forward sustainable development strategies. However, countries are at different stages: Cook Islands, Fiji, Nauru, Niue, Tonga and Tuvalu have all developed NSDS or have incorporated sustainable development principles into their national strategies and have begun implementing them. Trinidad and Tobago has launched its Vision 2020 Draft National Strategic Plan, a national strategy for 28 sectors under the overall umbrella of sustainable development. Barbados has developed its National Policy on Sustainable Development, and other Caribbean SIDS, including Belize, Haiti and St Kitts and Nevis have begun implementing their NSDS. Seychelles is implementing its Environmental Management Plan 2000–2010, which incorporates the principles of sustainable development and cuts across all sectors of society. A formal NSDS is under development, and preparatory activities such as multistakeholder consultations and national workshops have already taken place.

Other SIDS are currently reviewing, or have plans to review, existing national development plans or strategies with a view to incorporating principles of sustainable development and moving on to the implementation phase of NSDS. SIDS governments have proactively adopted or signed regional and international agreements that have committed them to pursue sustainable development objectives, including development and implementation of sustainable development strategies or policies. Despite progress made by many SIDS, challenges still remain in terms of fully integrating sustainable development priorities into national development planning and moving from strategy development to strategy implementation. Many SIDS's 'sustainable development strategies' focus on economic and social development, while neglecting the environmental aspects. Integration of the three pillars of sustainable development requires national planning processes to define economic, social and environmental objectives, revising decision-making systems to reflect and integrate environmental impacts, and ensuring horizontal coherence across sectoral policies.

Many SIDS countries, including Cook Islands, Fiji and Tonga, indicate that broad public participation in the development, formulation and implementation of national policies and strategies, including NSDS, have become standard practice in government initiatives. In these countries, extensive consultations at the local, regional and national levels are held with representatives from the private sector, non-governmental organisations (NGOs) and civil society organisations (CSOs), including youth, women and church leaders. Their comments and feedback are reflected in revised plans and strategies, and are circulated widely among all stakeholders. In Tonga, electronic comments on the structure and content of their NSDS were solicited through a website.

For other islands, multistakeholder consultations are held, but on an ad hoc basis. For example, Nauru reports that consultations with broad participation of stakeholders are held, both at regional and national levels. However, such efforts are fragmented, with limited systematic feedback of public participation into national programmes and policies. Many countries cite the dispersity of island populations and limited financial resources as major challenges, which hinder the full participation of representatives from different groups in decision-making processes.

Although in general civil society is consulted in the development of national strategies among the many SIDS countries, few mechanisms are in place to encourage the participation of a wide range of stakeholders when governments formulate budgets. Many CSOs and NGOs lack the capacity, skills and experience to effectively engage in a constructive dialogue with governments in relation to their prioritising and allocating resources. Moreover, CSOs and NGOs are often discouraged

from becoming more involved in the budget process, because of the technical, abstract and closed nature of that process in many countries. However, by engaging CSOs in budget processes, they will be able to better monitor the progress of implementation of NSDS.

Another challenge for many SIDS countries is institutional capacity and effective institutional arrangements to implement sustainable development strategies and programmes. The JPOI states that an effective institutional framework for sustainable development at all levels is key to the full implementation of Agenda 21, the follow-up to outcomes of the World Summit on Sustainable Development and meeting emerging sustainable development challenges.[10] The institutional aspect is often recognised as the fourth dimension of sustainable development. Sustainable development cannot be promoted and implemented by a single organisation, as the issues are multidisciplinary and impacts across organisations and sectors in a country.

Many countries, including Barbados, Belize, Fiji and Jamaica, have established institutional structures, such as national councils of sustainable development or commissions, to promote the formulation and implementation of NSDS. Many of these new institutions do not have the capacity to respond effectively to challenges posed by sustainable development, since they tend to be placed at the periphery of national development planning or their roles and responsibilities need to be reviewed and revised.

A common challenge cited by SIDS is the need for technical assistance and training in data collection, analysis and management, as well as development of appropriate indicators. Lack of data, the low quality of existing data and the difficulty faced by many countries in developing meaningful sets of indicators are barriers to the overall goal of achieving sustainable development.

The Mauritius Strategy calls upon states to develop appropriate national targets and indicators for sustainable development that can be incorporated into existing national data-collection and reporting systems.[11] MDG indicators and other general social and economic indicators are used by many SIDS countries to monitor and measure sustainable development efforts. However, as Papua New Guinea reports in its National Assessment Report, MDG indicators do not provide a critical yardstick to measure progress or useful learning tools from which to develop country-specific indicators for sustainable development. Monitoring progress towards sustainable development, as well as monitoring the implementation of NSDS with relevant, appropriate indicators is critical to ensure accountability, prioritisation, and to review and adjust the NSDS. Assessments play a central role in a NSDS, as part of the cyclical process of continuous improvement towards sustainable development.

For many countries, sustainable development is imperative rather than being a matter of choice. This is especially true for SIDS that have been directly impacted by current global climate change. Increases in storm surge, sea level rise, shoreline degradation and saltwater intrusion into wells – all consequences of climate change – having a devastating effect on the livelihoods and health of people on these small islands. At the 37th meeting of the Pacific Islands Forum in October 2006, leaders reaffirmed their commitment to the implementation of the Pacific Plan, including placing priority on mainstreaming climate change into their national sustainable development strategies. At the first ever high-level event on climate change convened by the UN Secretary-General in September 2007, participants, including more than 80 heads of state, expressed solidarity with the most vulnerable countries, in particular the SIDS, as they face the consequences of climate change. For many SIDS, the adverse impacts of climate change not only pose major obstacles to achieving sustainable development goals, but also threaten the very existence of some islands.

Sustainable development principles in SIDS are not new. However, a common challenge remains to address sustainable development issues over the long-term and to translate policies and strategies into programmes and initiatives that make a positive impact on a country's society and people. The implementation of a NSDS needs to be an integral part of government policies, but such strategies are not only the responsibility of governments. Sustainable development can only be achieved through individual and collective efforts by all responsible actors, including the private sector.

Notes

1. The author would like to thank Birgitte Alvarez-Rivero of the Division for Sustainable Development, UNDESA, for her helpful comments and suggestions regarding this chapter.
2. Agenda 21, para. 8.7.
3. BPOA, Preamble 11.
4. Ibid.
5. Programme for the Further Implementation of Agenda 21, para. 24.
6. Johannesburg Plan of Implementation, Chapter XI, para. 162(b).
7. St George's Declaration of Principles for Environmental Sustainability in the OECS, Principle #2.
8. The Pacific Plan, Strategic Objective 5.1.
9. Guidance in Preparing a National Sustainable Development Strategy: Managing Sustainable Development in the New Millennium, p. 8.
10. JPOI, Ch. XI, para. 137.
11. Mauritius Strategy, Chap. XVI, para. 74(c).

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Chapter 3

Disaster Risk Reduction and Adaptation to Climate Change

Introduction

Sustainable development is based on socio-cultural wellbeing, good governance, economic growth and environmental protection, which all contribute positively to reducing the risk of a disaster.

A natural disaster is the term used to describe the impact of a naturally occurring event (e.g. an earthquake, storm or tropical cyclone, or volcanic eruption) that has resulted in injury to people, loss of life, damage, social or economic disruption, or environmental degradation. Any potentially damaging event, phenomenon or activity is known as a 'hazard'. Hazards can be natural, or induced or exacerbated by human processes (e.g. land degradation, global warming).

The risk (probability) of a disaster occurring results from the interaction between the probability of a given hazard occurring and the degree of susceptibility of the exposed elements. The latter is a function of vulnerability versus the capacity to cope, withstand and recover from the impacts of a hazard (of the environment and the people).

Box 3.1 Calculating disaster risk

The elements that formulate the risk of disaster for a community are expressed in the following risk equation:

Risk = Hazard x Vulnerability / Capacity

Risk: The probability of a disaster occurring

Hazard: A potentially damaging physical event, phenomenon or human activity, which may lead to a disaster

Vulnerability: A set of conditions and processes (physical, social, economical and environmental) that increase the susceptibility of a community to the impact of hazards

Capacity: A combination of all the strengths and resources available within a community that can reduce the level of risk or the effects of a disaster

Disaster Risk Reduction (DRR) is a set of activities, described in the Hyogo Framework of Action (2005), undertaken by a community to minimise the risk of a disaster. DRR is carried out within the broad context of sustainable development, through the development of individual, social and institutional capacities (UN International Strategy for Disaster Reduction [ISDR], 2002) at the local, national and regional levels.

In the broadest sense, the environment or 'landscape' consists of the land and its processes (soil, topography, vegetation, animal life, water resources, air and weather), as well as the people who live on the land – their social and cultural values, ambitions, indigenous knowledge and practices. How much diverse activity or life a landscape can support (the carrying capacity), depends on its intrinsic characteristics as well as the demands made on it. There is a delicate, complex and changing balance between competing demands on the landscape that needs to be realised. This creates inevitable tensions, depending upon the different purposes and ambitions of the existing or potential users, the resilience of the environment, the quality and sustainability of land and water resource usage.

Reduction or loss of the biological or economic productivity of land is a major hazard. This hazard is aggravated by population pressures, and a lack of knowledge or appreciation of the negative impact over time of certain land use practices, exacerbated by changing climatic patterns. Our impact on the environment is a hazard, but need not necessarily result in a disaster.

All SIDS are especially vulnerable to climate hazards and water shortage, while those positioned along tectonic boundaries are vulnerable to earthquakes and volcanic eruptions. The available global data illustrates that losses due to weather disasters are increasing, and that such disasters represent 71 per cent of large-scale economic disasters. They cause 45 per cent of recorded fatalities, and 69 per cent and 90 per cent of economic and insured losses respectively (UN/ISDR, 2007). There is common agreement among scientists that climatic variability is likely to increase, as will the severity of extreme events.

Society is usually one step behind nature. Nature changes, society adapts. If the change is very rapid and/or we do not adapt in a timely manner, our negative impact on the landscape is escalated and contributes to an increase in vulnerability to, and/or the frequency and intensity of, natural hazards.

Thus disasters can be considered largely as a social construct, due to the coincidence of natural or human induced/exacerbated hazards with unsafe social conditions in a fragile environment and local economy (Blaikie et al., 1994). The greater frequency and severity of weather-related hazards, such as flood and drought regimes or storminess, and/or the greater vulnerability of human populations to the impacts of these hazards, will add to the increased environmental and social pressures arising from these global changes (Tompkins and Hurlston, 2005). This in turn increases the likelihood of disasters.

These pressures relate directly to the reduced or lost livelihood potential resulting from loss of environmental goods and services. Unless the land is rehabilitated and land use practices change, this loss of goods and services is permanent. It is evident from table 3.1 that land use planning, education and training for the adaptation of livelihoods, and development of community and environmental resilience are also required for sustainable development of natural, social and financial capital. For example, without appropriate land use planning, a community could degrade a catchment and its water supply, reduce productivity of land through erosion and diminish the natural goods and services found in wetlands, the forests and on the coastal flood plain, all with impact on livelihoods of those who live in these environments.

Table 3.1 Examples of goods and services provided by different environments

	Goods	*Services*	*Key sectoral impact*	*Examples of best practice*
Wetlands	Water Food (e.g. fish) Thatch	Water filtration Flooding protection	Water resource management Health and sanitation	iSimangaliso Wetland Park, KwaZulu-Natal, South Africa
Coastal dunes and mangroves	Building materials Fuel wood Fish Pharmaceuticals	Coastal protection Fish nurseries	Tourism and recreation Infrastructure development Fisheries and rural development	Kiralakele mangroves, Ambalantota, Sri Lanka
Coral reefs	Fish Pharmaceuticals	Fish nurseries Shoreline protection	Tourism and recreation Fisheries and rural development Infrastructure development	Bonaire Marine Park, Netherlands Antilles, Caribbean
Forests	Food (plants and animals) Fuel wood Building materials Medicinal plants	Soil stabilisation and erosion prevention Oxygen production and CO2 reduction	Agriculture and rural development Water and environmental resource management	Atsinanana rainforests, Madagascar
Mountains	Water Useful plants Food (animals)	Water catchment and storage Water quality Recreation	Water and environmental resource management Agriculture and rural development	

In developing countries, disasters cost more, in relative terms, than in developed countries, causing serious setbacks to economic and social development (UN/ISDR/Umvoto, 2005). Instead of contributing to growth, resources for development assistance are diverted into humanitarian responses, recovery and rehabilitation needs. Women and girls are especially vulnerable to the impact of disasters on security, health, life and livelihood (Aquilar, 2004; Neumayer and Pluemper, 2007). The 2007 Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (AR4) indicates that data for SIDS is thin, with few monitoring centres. The report sets out a series of expected impacts of disasters, including the impact on food security and increases in forest fires. The responses to these disasters are then classified into technical, behavioural, managerial and policy responses. This could be helpful in establishing a more concrete framework for action in relation to the specificities of the evidence, including the need for research and development.

Box 3.2 Poverty and disaster risk reduction in Mauritius

As with many other small island developing states, Mauritius is vulnerable to cyclones and drought. Agriculture is a major component of the country's economy, and natural hazards can have a huge impact on agricultural production, significantly affecting the national economy. Not only do such hazards affect the livelihoods of communities directly, but they also impact the government's ability to provide aid to assist communities to recover. This can lead to increasing poverty.

The Government of Mauritius is giving top priority to poverty reduction through the implementation of its National Action Plan for Poverty Alleviation, taking place via a partnership of the public and private sectors with civil society. As most of the poor have access to key social services, the issues in Mauritius relate more to social exclusion than of abject poverty, and to diversification of the economy.

In 2003, the government began to implement an ambitious economic programme called the New Economic Agenda (NEA) in an effort to diversify the economy and maintain strong economic growth. The programme has three key objectives: (i) to increase competitiveness, (ii) bring about deeper social development and social cohesion, and (iii) preserve and protect Mauritius' fragile environment.

Development in resource-poor countries often contributes to environmental vulnerability in exchange for more immediate tangible gains in the formal and cash economy. See, for example, box 3.3.

Box 3.3 Traditional management of the Chwaka Bay mangroves, Zanzibar, Tanzania

The destructive clearance of coastal mangroves in low-lying island countries to make way for agriculture, urbanisation and tourism, removes a wide range of vitally important ecosystem services. These include protection against coastal erosion and coastal flooding, from cyclonic storm surges and tsunamis, previously provided free of charge by nature. The result is 'mal-adaptation', caused by a lack of information about, or consideration of, the potential effects and benefits of DRR policies and practices on other sectors of the economy or society (*Stern Review*, 2007, p. 433).

The Jozani-Chwaka Bay Conservation Area in Zanzibar provides a good example of the conflicts between traditional sustainable practices and knowledge versus shifting political situations and ever-increasing technological dominance. The conservation area comprises 2,800 hectares (ha) of mangrove forest (approximately 5 per cent of Zanzibar's total forest cover), among a wide variety of other habitats (coral rag forests, salt marshes, groundwater forests), and is home to the endemic and highly endangered Zanzibar leopard, red colubus monkey and Ader duiker. At the Earth in Transition conference in Zaragoza, Spain, in 2005, Soud Mohammad Jumah presented a review of the management practices in place to manage the Chwaka Bay mangroves.

In the past, the eight villages surrounding Chwaka Bay set up a formal (but non-legal) mangrove council, which was supervised by village elders and issued permits or penalties with respect to mangrove exploitation. The elders themselves had a wealth of knowledge with respect to lunar and tidal cycles and the effects on fish availability, as well as when and where to harvest mangrove wood, resulting in the sustainable use of the mangrove forests. Any income from the permits and penalties was used to run the council or put back into local community projects. This traditionally run management system collapsed due to political changes, commercialisation, population growth, technical innovations and a reduction in the elders' authority as custodians of the mangroves.

Exploitation and degradation of the mangroves have since resulted in local communities realising the intrinsic benefits that are present, leading to the establishment of a formal, legal conservation committee in association with local district authorities. Alternative income projects have also been established.

Disaster Risk Reduction (DRR) measures, if correctly implemented, generally have a high benefit-to-cost ratio, which makes it sensible to improve disaster preparedness and emergency planning, and to integrate these into development planning. Further, DRR measures generally save lives and property and can be highly cost effective in bringing significant developmental benefits in normal times, a lesson that is reinforced by the current focus on climate change. However, effectiveness depends on DRR interventions being adequately researched, funded and gender sensitive (Anderson, 2002; Joshi, 2007; Agarwal, 2002; inter alia).

The constructive counterpart to maladaptive practice is 'adaptation', broadly defined as 'any adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. The objective of adaptation is to reduce vulnerability to climatic change and variability, thereby reducing their negative impacts. It should also enhance the capability to capture any benefits of climate change' (*Stern Review*, 2007, p. 405).

Adaptation is not an easy option. Apart from its intrinsic costs, residual damages from climate change will often remain. To overcome resistance, it will be necessary to mainstream adaption into the wider process of DRR and sustainable development, rather than relegate it to the class of special measures, separately funded and executed. Adaptation is in effect DRR, with particular focus on vulnerabilities to existing and potential climatic changes, and on the opportunities for interventions that will benefit regardless.

For poor people, there are many urgent needs and immediate problems that demand attention and investment. If they are to reduce the impacts of climate change, adaptation strategies should work to reduce poor peoples' vulnerabilities, strengthen their resilience, retrain them for different livelihood opportunities (if necessary) and, most importantly, engage them in developing the strategic approach and the implementation thereof. It must be 'a process that is itself adaptive and flexible to address the locally specific and changing circumstances that are the reality of the lives of the poor' (International Institute for Sustainable Development [IISD], International Union for the Conservation of Nature and Natural Resources [IUCN] and Stockholm Environment Institute [SEI], 2003, p. 16). While obvious poverty tends to motivate precipitate action, caution must be exercised to ensure that the intervention also reduces vulnerability to present or future hazards, and increases the capacity to adapt to the impacts of climate change as they materialise.

The actual practice of DRR focuses on reducing the social vulnerability of poor people by building capacity, livelihood and environmental resilience. Gender-sensitive and hazard-specific approaches are necessary for success, and to ensure that DRR and climate change adaptation also support the achievement of the Millennium Development Goals. The purpose of DRR is to learn from previous disasters, and work with governments at all levels to address the fundamental causes and consequences of loss of life and livelihoods. Success depends on integration into development and humanitarian policy, and planning. It also depends on more 'effective financing, based on country-led approaches where national governments are accountable and committed to long-term investment' (*Stern Review*, 2007, p. 566). The current international concerns about climate change, along with multilateral obligations towards National Climate Change Adaptation Programmes/Policies/Plans (NCCAPs) and National Action Plans for Adaptation (NAPAs), are the key to a long-term commitment, which effectively equates 'adaptation' with 'risk reduction'.

Sustainability, adaptation and disaster risk reduction

'Mainstreaming' is commonly defined as a process of assessing the implications of disaster risk for any planned development action in all sectors and at all levels, thus incorporating risk reduction concerns and experiences into the design, implementation, monitoring and evaluation of policies and programmes. The root causes of disaster risk (hazards, vulnerability, and lack of adaptive capacity) are addressed and managed through the integration of DRR measures into development and humanitarian programmes.

Mainstreaming DRR practice into climate change adaptation, so that both contribute to the longer-term sustainability of the three pillars of development – social, environmental and economic – requires:

- Explicit identification of the particular hazards associated with long-term climate change in a specific local context. 'Once we accept that risk, vulnerability and adaptive capacity are hazard-specific, we must then recognise that there are many different kinds of climate hazard, operating over a variety of different timescales and requiring a variety of adaptation responses. A system may have the capacity to adapt to certain types of hazard, but not to others' (Brooks, 2003, p. 9).
- Elaboration of the hazard impacts and vulnerability to the impacts, whether primary, secondary or tertiary, across all development sectors and on all groupings in society.
- Production of concrete and actionable, gender-specific DRR strategies or intervention programmes within and between the relevant sectors. At the country level, a special 'national platform' is often recommended to realise effective cross-sectoral DRR policy programmes and implementation. Regional co-operation supports best practice and knowledge transfer.

The integration of DRR into sustainable development policies and planning is the first of three main strategic goals of the *Hyogo Framework for Action (HFA) 2005–2015* (UN/ISDR, 2005), as agreed at the World Conference on Disaster Reduction (WCDR) and expressed in the following five priorities for action (PfA):

1. Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation
2. Identify, assess and monitor disaster risks and enhance early warning
3. Use knowledge, innovation and education to build a culture of safety and resilience at all levels
4. Reduce the underlying risk factors
5. Strengthen disaster preparedness for effective response at all levels

Consideration of gender and cultural diversity, community and volunteer participation, capacity building and technology transfer, cut across each of these priority areas.

Key impacts of climate change for SIDS

Unique challenges for SIDS, accompanied by increased levels of risk and uncertainty, arise through four potential environmental impacts:

1. Slow changes in mean conditions (sea level, air temperature, sea-surface temperature, precipitation rates)
2. Increased seasonal and inter-annual variability

3. Increased frequency of extreme events (windstorm, cyclone, flood)
4. Abrupt systems changes (rapid threshold transition to ecosystem collapse, species extinction)

A brief summary of selected aspects of these impacts illustrates the imperative for assessing vulnerability of and risk to people and the environment (figure 3.1). Human vulnerability can stem from existing practices and pressures, and will vary depending upon the hazard being considered. Environmental vulnerability is hazard-specific and can be increased or minimised through human intervention.

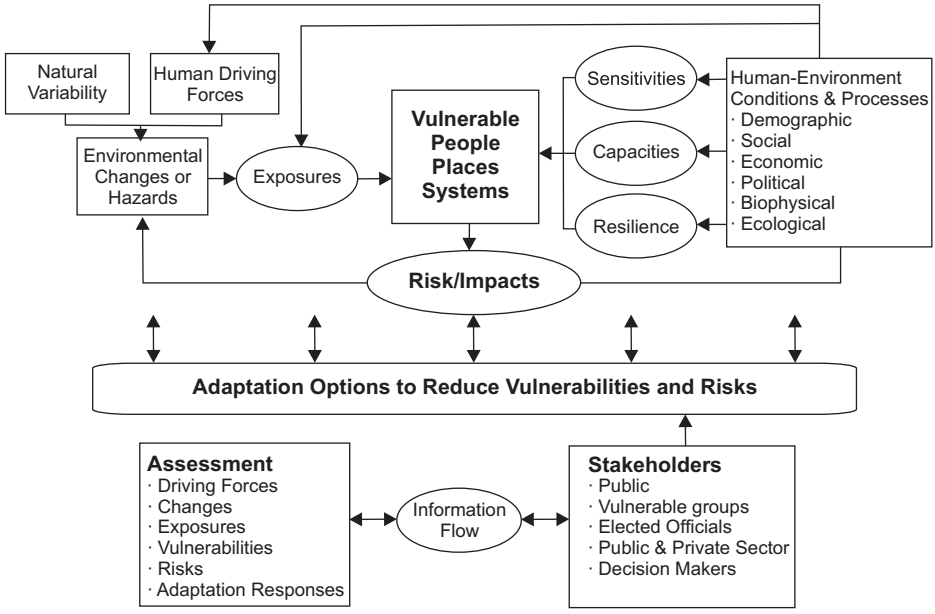


Figure 3.1 Global environmental change vulnerabilities, risks and responses: a framework for assessments of impacts and adaptations to climate change. Available from http://www.aiaccproject.org/about/about.html [last accessed 30 June 2010]

Sea-level rise

Approximately 75 per cent of the world's population live in the coastal zone, within 20km of the shoreline, and as a result are affected by large-scale coastal hazards associated with climate change. SIDS are vulnerable to sea-level rise, due not only to obvious geographical factors and resource limitations, but also to injudicious development resulting in degradation of protective barriers.

The Pacific, Indian Ocean and Caribbean regions bear only a tiny share of the total global damage, but the costs for SIDS have to be related to the small size of their economies and the proportion of their finances necessary to implement protection. For example, the 26 December 2004 tsunami caused extensive damage to Maldives's fisheries and agriculture and tourism sectors, with costs equating to approximately 3 per cent and 25 per cent of the country's GDP respectively. The amplitude of the tsunami crest was about 2m, which is more than twice the expected rise in sea level resulting from climate change over the next century.

The impact of other hazards, such as storm surge triggered by more frequent tropical cyclones, which can often exceed 5m above the mean high water height, will also be exacerbated by an increase in sea level. The composite impact of both sea-level rise and increased storminess could cause significant changes, including changes to social patterns of coastal occupancy, even triggering coastal abandonment. It could hence have an untoward or unexpected influence on society's future choices, despite improved protection due to adaptation to climate change.

Resource stresses

An increase in heavy rainfall events, changes in precipitation patterns and more intense or frequent cyclones and hurricanes, are the projected consequences of a warming trend in the ocean surface (sea-surface temperature [SST]). These consequences have already been detected around SIDS, and are expected to continue. Thus climate change will escalate the existing pressures of population increase and poor land use on natural resources. A decline in natural resources will challenge traditional gender- and kin-based mechanisms for coping with and sharing risk.

Water

Degradation and reduced assurance of supply of fresh potable water resources, due to decreased and/or more variable rainfall and saltwater intrusion, is expected. Health risks arising from waterborne diseases will affect women and children more than they do men, because they are the primary fetchers and users of water; the breadwinner, who goes elsewhere to work, is often less exposed to the threat. Some waterborne diseases are related to changes in temperature and rainfall, as well as water resource management practice. Because climate change will likely exacerbate current gender inequalities, health impacts must also be considered from a gender-based perspective.

Land

Aside from inundation of settlements and arable land on the coast of SIDS, negative impacts on agriculture and the economy include reduced agricultural yields from shortening of the growing season or drought across a wider area. Food insecurity could increase, unless the yield per hectare is increased locally and farming practices adjust to changes in rainfall patterns and temperature increases. The loss of natural habitats that host alternative sources of food or income will exacerbate malnutrition and poverty in the event of drought or crop loss.

A local-level gender-sensitive understanding of livelihood roles is relevant for devising solutions in a climate change context. Tasks assigned to rural women on the basis of their gender roles, such as wood and water collecting, are time and energy consuming. As these resources diminish, an ever-increasing work and time burden will result in even less time for learning or participation in decision-making. Specific targeting of sex and age groups is essential for successful adaptation (IPCC, 2001; Hannan, 2002; Anderson, 2002; The Equilibrium Fund, 2007).

Habitat and biodiversity loss

A key element of sustainable development is the conservation and sustainable use of biological diversity, the combination of life forms and their interactions with each other and the rest of the environment that has made Earth a uniquely habitable place for humans.

DRR planning and implementation must take into account that at some point resource stress passes a tipping threshold and there are irreversible environmental losses. The stress can be gradual or it can be sudden. The consequence is reduced biodiversity because of habitat loss, as will happen

if terrestrial forests are damaged by greater frequency and/or severity of storms or by increasing temperatures and intolerable changes in rainfall patterns. Similarly, coral reefs will be threatened by the increased sea-surface temperature and acidification of the oceans. This, in turn, will impact on fish populations and ultimately on livelihoods. Loss of biodiversity results in loss of genetic diversity and ecosystem resilience, increased vulnerability of food sources to disease and climatic changes and therefore increased livelihood vulnerability, especially in the rural and agriculture sectors. These impacts will be most keenly felt by the rural poor and by women. It is important to know the time line needed to change current practice and rehabilitate ecosystems, to prevent or limit irreversible environmental losses under present and predicted climatic circumstances.

Economic and demographic stresses

Adverse impacts of climate change are expected to exacerbate the impact of existing development challenges, such as market loss and the declining value of traditional exports. Tourism in particular is concentrated along the coastal zone, which is already vulnerable because of poor development practices and most vulnerable to multiple impacts arising from sea-level rise.

Creeping urbanisation and industrialisation of the coastal zone will increase, together with migration offshore in search of work. The cumulative impact on economic growth could result in movement of capital offshore, escalating property prices for increasingly smaller areas of land and knock-on effects of reduced direct foreign investment and official development assistance.

Policy, planning and intervention

An integrated conservation and development approach that realises greater ecological stability and flexible institutions for resource management is required. Adaptive management, also known as 'learning by doing', is an evolving but always improving system developed through an iterative learning and decision-making process. It requires robust institutional arrangements and structures, and a culture of reflection in decision-making while managing the risk of undue costs.

The perspective of adaptive management is helpful to avoid a semantic distinction between 'mitigation' and 'adaptation'. Mitigation is often viewed as necessary action now to avoid or minimise future impacts, while adaptation is viewed as something to plan for, but do in the future. However, adaptation can only be deferred if either the costs of adaptation or failing to adapt are not excessive, or a community can adapt fast enough when it becomes obvious that it must. Both these circumstances are unlikely in the SIDS environment. Adaptation to climate change is disaster risk reduction, and implementing mitigatory measures is adapting to the threat of climate change.

It is necessary that DRR policies and funding be coherent and co-ordinated between and within ministries in the effort to adapt and also promote sustainable development. Table 3.1 serves to illustrate this, but is not intended to be exhaustive. Key to realising the benefits of adaptation is the social and political will to advance co-operative governance in a sustained and comprehensive way. This can be encouraged by undertaking awareness and education programmes, including deep leadership training for men and women at all levels of government and in the community, thereby improving institutional and communal capacity, resilience and efficiency through a participatory process.

There is a need for strong local structures and engagement with communities, civil society, businesses and local government at all stages of policy development and implementation.

Stakeholder participation becomes a mutual education and awareness raising process for all players, and supports the probability of realising individual cognition, informal group action and support for formal institutional change, all factors recognised as critical to success. It is useful to consider the following key questions at all stages of DRR to support and encourage policy, managerial, technical/research and behavioural focus.

1. Establish context – What are we trying to do?
2. Identify risks – What can happen?
3. Analyse risks – What effects will they have?
4. Evaluate risks – Which are most important?
5. Accept risk – Should we spend time, effort, money on this problem?
6. Treat risk – What can we do about this problem?
7. Monitor/Review – Has it worked, is it still the best solution?
8. Communicate and consult – Has everyone been involved (including women, men, youth, the elderly)? Does everyone know what to do? Are you building on people's strengths?

Implementation is hazard- and site-specific. There is no implementation without an assigned and sustained budget. Each division in government, at all layers of government, should be responsible for DRR – e.g. in education from primary school to adult learning, in land use planning, tourism and the environment, with cross-sectoral rationalisation. There are numerous resource books prepared by various UN, NGO and scientific agencies, and there is much to be learned and adapted from the approaches adopted by countries that have already initiated the implementation process, e.g. Mexico, India and Sri Lanka. A number of these resource books and websites are listed in a bibliography at the end of this chapter.

SIDS examples of successful policy approaches

The following regional examples illustrate successful adaptation policies and best practice in different SIDS regions in response to different stresses and threats, and in accordance with the Barbados Programme of Action for the Sustainable Development of Small Island Developing States and the Mauritius Strategy.

Pacific region

The climate variability, development and social changes, and rapid population growth being experienced by most Pacific Island countries, are already placing pressure on sensitive environmental and human systems. These would be exacerbated by the anticipated changes in climate and sea level (including extreme events). In most parts of the Pacific region, 'problems resulting from increasing demand for water and increasing pollution of water may be much more significant that the anticipated effects of climate change' (Falkland et al., 2002, p. 33).

The South Pacific Applied Geoscience Commission (SOPAC) has developed a comprehensive set of guidelines for Comprehensive Hazard and Risk Management (CHARM), defined as a tool and/or process within the context of an integrated national development planning process (SOPAC, 2002). In addition, the Pacific Dialogue on Water and Climate was established as a 'platform through which policy-makers and water resource managers have better access to and make better use of information generated by climatologists and meteorologists' in order to 'improve the capacity

in water resources management to cope with the impacts of increasing variability of the world's climate' (Falkand et al., 2002, pp. 1–2).

The Pacific Islands Climate Change Assistance Programme (PICCAP) concluded that the current lack of detailed regional and national information on climate and sea-level changes, including changes in variability and extremes, limits the capacity to answer 'what if' questions regarding environmental and human responses to possible stresses. However, since the United Nations Framework Convention on Climate Change (UNFCCC) was drafted, a greater appreciation of the role of variability and a general recognition that the impacts of climate change are likely to be experienced through changes in variability, both suggest that 'managing water resources for variability and extremes is fundamental to the issue of adapting to climate change in the longer term' (Falkland et al., 2002, p. 33).

Improved management and maintenance of existing water supply systems is identified as a high priority response to climate change vulnerability (Hay and Sem, 2000), due to the relatively low costs associated with reducing system losses and improving water quality. Catchment protection and conservation are relatively low-cost measures to help ensure that supplies are maintained during adverse conditions. Such measures will also have wider environmental benefits, such as reduced erosion and soil loss and maintenance of biodiversity and land productivity. These are examples of a 'no regrets' adaptation policy.

Other recommended water resource management adaptations (Falkland et al., 2002) include:

- development of drought and flood preparedness strategies,
- improvement of water storage capacity through the increased use of water tanks and/or the construction of small-scale dams, which – although expensive – is justified by added security of water supply,
- development of rainwater harvesting options, mainly through collecting water from the roofs of buildings, but also through development of runways and other impermeable surfaces as a water catchment, where possible,
- evaluation and adoption of measures to protect groundwater resources, including those that limit pollution and the potential for salt-water intrusion, and
- investigation of the limited groundwater resources as yet unutilised in the outer islands of many countries, and implementation of measures for their protection, enhancement and sustainable use, where appropriate.

The development of desalination facilities is possible for supplementing water supplies during droughts, but the energy-intensive character of this option and high costs prevent it being considered as a widespread adaptation option.

Acting now to reduce present-day vulnerability, and not only with regard to water resources management, contributes toward diminishing the effects of future climate change. The adoption of a 'no regrets' adaptation policy, the development of a broad consultative process for implementing adaptation, adaptation screening for major development projects and the strengthening of socio-economic analysis of adaptation options, all reflect the mainstreaming of climate change adaptation policies (Falkland et al., 2002), and illustrate that '… (u)nderstanding how small islands respond to existing environmental risks can provide lessons for how to prepare for future risks associated with climate change' (Tompkins and Hurlston, 2003).

Caribbean region

The Caribbean Disaster Emergency Management Agency (CDEMA) is the agency of the Caribbean Community and Common Market (CARICOM) responsible for disaster response in any of the 16 participating states. CDEMA works to create a methodical and preventative approach (Alleyne, 2007) for comprehensive disaster management through the assessment of vulnerability (UN/ISDR, 2004).

In more developed SIDS, such as some of those in the Caribbean, the priority for climate change adaptation is found less in the natural (e.g., water) or agricultural/rural resource sectors, and more in the sophisticated sector of infrastructure development and protection. Because populations tend to congregate in a few urban centres where most of the infrastructure and services are located, damage to important infrastructure (e.g., coastal roads, bridges and seawalls, due to sea-level rise) would severely disrupt economic, social and cultural activities. Consequently, within the Caribbean Hazard Mitigation Capacity Building Programme (CHAMP), particular attention is paid to assessments of critical public infrastructure facilities and structures with regard to the effects of the extreme events (severe hurricanes, storm surge, flooding) that are anticipated to increase under scenarios of climate change.

These vulnerability assessments involve systematic examinations of building elements, facilities, population groups or components of the economy to identify features that are susceptible to damage from the effects of particular hazards. They generally use hazard-specific maps and databases of critical infrastructure, automated within the spatial databases of existing national geographic information systems.

Vulnerability can be estimated for individual structures, for specific sectors or for geographically selected areas, for example, those with superior development potential or those already developed in hazardous zones. Infrastructure categories include power generation and distribution (hydropower and other electrical utilities, transmission lines), water and sanitation facilities (dams, pipelines, sewage works), transport networks (roads, bridges, airports, seaports), waste management sites, and government and public buildings (key administrative centres, fire and emergency response centres, schools, hospitals). For given hazard scenarios, such as a category 3 or greater hurricane event, a monetary value for probable maximum loss (PML) can be attached, which should reflect: (i) the local topography and geology, (ii) the level of professional design attention given to the structures, (iii) local building practices, (iv) the characteristics of the specific construction materials, and (v) the existing condition of the structures.

The results of such vulnerability assessments are used to prioritise mitigation activities (e.g., identify retrofit needs and suitability for insurance) and to inform planning and preparedness for disaster response and recovery. Structural vulnerability assessments of selected government buildings and schools for use as potential emergency shelters have been carried out in many countries and territories in the Caribbean region.

The concern is that the overall costs of infrastructure protection will be beyond the financial means of many island nations. Consideration is therefore being given to private–public sector partnerships in the insurance and re-insurance industry to secure key infrastructure.

Indian Ocean region

The Indian Ocean Commission (Commission de l'Océan Indien [COI]), is an intergovernmental organisation that brings together the Comoros, France (Réunion Island), Madagascar, Mauritius

and Seychelles, with the objective of promoting sustainable development in the Western Indian Ocean Islands. It also represents the island states in international forums and defends their interests with regard to specific environmental and economic issues.

The COI countries are widely disparate in terms of levels of development. As a 'least developed country' (LDC), the Union of Comoros is included in the National Adaptation Programmes of Action (NAPAs) process for LDCs, which seeks to identify priority activities that respond to their urgent needs with regard to adaptation to climate change. The Comoros has already completed the process, and in its NAPA priority activities relate to dealing with water shortages, either for the population or for agriculture, with the highest priority being the introduction of plant varieties more adapted to drought.

Challenges encountered in the NAPA process of the Comoros, but not limited to there, included the limited knowledge of the communities and development stakeholders about climate change, the unpredictability of effects, the reliability of the adaptation measures advocated in the face of different planning scenarios, institutional weaknesses, possible difficulties in obtaining the necessary financial resources for implementation, and social, cultural and economic concerns about the daily life of particularly vulnerable populations.

In highly developed Mauritius, coastal policy and practice provides an example of how best practice can filter through to civil society, to support the sustainable use and management of a fragile ecosystem without negatively impacting on the economy. Tourism in Mauritius is almost entirely dependent on its coastal resources, particularly the health of the coral reefs. Most development and associated impacts occur within the coastal zone, placing these fragile ecosystems at risk. Legislation that links all intra- and inter-governmental levels, as well as business, labour, community and NGO groups, provides an effective mechanism to achieve sustainable tourism development. Alliances between the various governmental ministries, the private business sector, donors, and scientific and technical elements of the NGO community, have created an intellectual synergy for dealing with complex issues related to diving and other tourist uses of the marine environment.

As many marine park users are willing to pay extra to view undamaged, pristine coral ecosystems, Mauritius follows 'pay to preserve' and 'willingness to pay' principles. Tourism, which once formed part of a larger environmental problem, now forms part of the solution as it acts as a catalyst for environmental preservation. Local communities feel a degree of custodianship and preserve coral ecosystems through their application of traditional know-how, once the benefits of increased environmental tourism are felt.

This example illustrates how implementation of cross-sectoral planning with a risk-reduction focus, co-ordinated and led by a strong ministry, can address the issue of sustainable tourism successfully. Likewise, it may be applied to some of the challenges faced by Comoros, through integrated legislation with strong involvement of all stakeholders and a balance between institutional, economic and environmental factors.

Table 3.2 Sectoral activities aligned with HFA Priority Areas for Action

	Sectors							
HFA Priority Areas for Action	*Water resource management*	*Environmental management*	*Land-use planning*	*Agriculture and rural development*	*Infrastructure development*	*Health and sanitation*	*Education and training*	*Tourism and recreation*
1. Institutional requirements	Water management authorities, dominant water users, donors, consultants, academics, civil society	Environmental authorities, consultants, academics, environmental interest groups, civil society	All spheres of governance at all levels, town and rural planners, communities	Agricultural authorities and farmers, rural development institutions, rural leaders, communities	National, provincial and local departments of transport, housing, water and sanitation, economics and tourism, power; relevant local municipalities	Health and sanitation authorities, hospitals, clinics, private medicine	Formal and informal education, tourists, media and community participation, gender leadership and specific interest groups	Onshore and offshore tourist organisations, media, sporting authorities, relevant public groups
2. a) Identify risks	Assessment of available resources, threats to quality and assurance of supply, consumption patterns, storage facilities, opportunities for reuse of treated effluent for domestic or other purposes; waste water management	Identify and prioritise habitats, species and goods and services at risk to specific hazards	Identify hazards and time scales, vulnerable or degraded land-use zones; document and implement best practice, identify and initiate optimal adaptation to slow onset disasters	Identify agricultural, land-use and environmental practices that increase economic vulnerability, reduce reduce food security, reduce yield/ha in long term; initiate gender-specific social and technical knowledge transfer and adaptation of livelihoods	Identify infrastructure at risk to specific hazards; document and implement best building and planning practice	Monitor epidemiological and gender-specific changes; evaluate social, environmental and economic factors; prioritise prevention and education and determine whether health and sanitation can meet risk requirements	Exploit opportunities to raise awareness and funding for long-term education towards social, behavioural, institutional and political changes needed to initiate and promote adaptation	Evaluate economic impact of environmental degradation, loss of social cohesion and declining economy on tourist-related income

	Sectors							
HFA Priority Areas for Action	*Water resource management*	*Environmental management*	*Land-use planning*	*Agriculture and rural development*	*Infrastructure development*	*Health and sanitation*	*Education and training*	*Tourism and recreation*
3. Communication and education	Communication and training between relevant water authorities, consultants and users	Communication and training between environmental authorities, consultants and relevant communities	Communication of land-use decisions to all interested parties	Interaction of agricultural and rural community leaders – men and women	Communication between town and provincial managers and planners	Community health and sanitation awareness and education campaigns	Public awareness and media; school, tertiary and community DRR education	Risk education for tourists – notices, pamphlets, signs, tour guides etc.
4. Risk reduction	Integrated water resource management; water conservation demand management; resource protection and reuse of treated effluent for domestic and other purposes	Sustainable ecosystems and environmental management (including biodiversity theory); initiate adaptive management strategies	Strategic Environmental Assessments (SEAs) and building codes; conservative set back from high water mark (HWM)	Rural development plans; technical, social, cultural and gender adaptation for food security; social and economic resilience	Protection of critical public facilities and infrastructure; education and awareness raising	DRR integrated into health sector and safe hospitals; primary health care	Public–private partnerships; develop culture of custodianship within the community; disseminate DRR message to different cultural and language groups	Protection of areas with high tourism and recreational use and potential – 'pay to preserve' principle; rewarding staff for best practice; micro-financing
2. b) Monitoring	Monitoring boreholes, surface water monitoring, consumption monitoring	Species richness and diversity; habitat coverage; sea temperature changes, climatic indices	Monitor records of decisions, remote sensing of land-use changes; sea-level change monitoring – neotectonic movements, eustatic water levels	Monitor crop yields, changes in patterns of land degradation	Constant monitoring of infrastructure to observe whether it still meets hazard safety requirements	Monitoring of medical care facilities to see if they are in line with risk requirements	Testing successes of training and education programmes	Tourist questionnaires, monitoring vulnerable sites

	Sectors							
HFA Priority Areas for Action	*Water resource management*	*Environmental management*	*Land-use planning*	*Agriculture and rural development*	*Infrastructure development*	*Health and sanitation*	*Education and training*	*Tourism and recreation*
5. Disaster preparedness and response	Emergency water supplies and availability	Buffer zones, e.g. vegetated dune systems, protection and replanting of mangrove forests	Buffer zones e.g. buffers around industrial areas	Regional relief systems and supplies	Identify non-risk areas and evacuation plans; emergency system system plans – power, rescue services etc.	Contingency plans for increased public health services and supplies during a disaster	Early warning and preparedness education; community volunteer programmes; media alerts; new educational technologies, e.g. virtual reality (VR) simulations	Specific evacuation plans in place for each tourist/ recreation area; engineering solutions e.g. artificial reefs; contingency plans for exploiting new tourist areas

References

Agarwal, B (2002). Participatory Exclusions, Community Forestry, and Gender: An Analysis for South Asia and a Conceptual Framework. World Development 29(10): 1623–1648.

Alleyne, N 2007 Spaced-based information for comprehensive disaster management – a CDERA perspective. Available at: http://www.cdera.org/workshop/un-spider/day1/ALLEYNE-CDERA.pdf [last accessed 11 August 2010].

Anderson, C (2002) Gender Matters: Implications for climate variability and climate change and for disaster management in the Pacific Islands. Available at: http://www/gencc.interconnection.org/resources.htm

Aquilar, L (2004) Fact sheet on climate change and disaster mitigation. Costa Rica: International Union for the Conservation of Nature and Natural Resources (IUCN).

Blaikie, P, Cannon, T, Davis, I and Wisner, B (1994) *At Risk: Natural hazards, people's vulnerability and disasters*. London, UK: Routledge.

Brooks, N (2003) Vulnerability, risk and adaptation: A conceptual framework. Tyndall Working Paper, 38. Norwich, UK: Tyndall Centre for Climate Change Research, University of East Anglia, 16pp.

Environmental Resources Management (2006) Natural disaster and disaster risk reduction measures – a desk review of costs and benefits. London, UK: Department for International Development (DFID).

The Equilibrium Fund (2007) Reforestation. Available at: http://www.theequilibriumfund.org/page.cfm?pageid5494 [last accessed 1 July 2010]

Falkland, A, Overmars, M and Scott, D (2002) Pacific Dialogue on Water and Climate: Synthesis Document. Suva, Fiji: South Pacific Applied Geoscience Commission (SOPAC), 47pp.

Hay, J E and Sem, G (2000) Vulnerability and adaptation: evaluation and regional synthesis of national assessments of vulnerability and adaptation to climate change. South Pacific Regional Environment Programme.

Hannan, C (2002) Mainstreaming gender perspectives in environmental management and mitigation of natural disasters. 46th Session of the Commission on the Status of Women, New York: United Nations.

Intergovernmental Panel on Climate Change (IPCC) (2001) Climate Change 2001: Impacts, Adaptation, and Vulnerability. Geneva: Intergovernmental Panel on Climate Change.

Intergovernmental Panel on Climate Change (IPCC) (2007) 'Summary for Policymakers'. In *Climate Change 2007: The Physical Science Basis IV Report of the IPCC*. New York, USA: Cambridge University Press.

International Institute for Sustainable Development (IISD), IUCN and Stockholm Environment Institute (SEI) (2003) *Livelihoods and Climate Change: Combining disaster risk reduction, natural resource management and climate change adaptation in a new approach to the reduction of vulnerability and poverty*. Manitoba, Canada: International Institute for Sustainable Development.

Joshi, G (2007) The Chipko movement and women. Peoples Union for Civil Liberties. See: www.pucl.org/from-archives/Gender/chipko.htm [last accessed 17 August 2010].

Mohammad Jumah, S (2005) Traditional management of Chwaka Bay mangrove ecosystem in Zanzibar, Tanzania – the present status and future strategies. Zaragoza, Spain: Earth In Transition conference, 13 September 2005.

Neumayer, E and Pluemper, T (2007) The Gendered Nature of Natural Disasters: The Impact of Catastrophic Events on the Gender Gap in Life Expectancy, 1981–2002. See: http://ssrn.com/abstract=874965 [last accessed 17 August 2010].

South Pacific Applied Geoscience Commission (SOPAC) (2002) Regional Comprehensive Hazard and Risk Management (CHARM): Guidelines for Pacific Island Countries. Suva, Fiji: SOPAC Report DM0044, 32 pp.

Stern, N (2007) *The Economics of Climate Change: The Stern Review*. Cambridge, UK: University Press, 712pp.

Tompkins, E L and Hurlston, L-A (2003) Adaptation lessons learned from responding to tropical cyclones by the Cayman Islands' Government, 1988–2002. Report to the Cayman Islands' Government. Tyndall Working

Paper 35, September 2003. Norwich, UK: Tyndall Centre for Climate Change Research, University of East Anglia.

Tompkins, E L and Hurlston, L-A (2005) Natural hazards and climate change: what knowledge is transferable? Tyndall Working Paper 69, March 2005. Norwich, UK: Tyndall Centre for Climate Change Research, University of East Anglia.

Tompkins, E L, Nicholson-Cole, S A, Hurlston, L, Boyd, E, Hodge, G B, Clarke, J, Gray, G, Trotz, N and Varlack, L (2005) *Surviving Climate Change in Small Islands – A guidebook*. Norwich, UK: the Tyndall Centre for Climate Change Research. Available at: www.tyndall.ac.uk/publications/surviving.pdf [last accessed 1 July 2010]

United Nations Framework Convention on Climate Change (UNFCC) (2007) Vulnerability and Adaptation to Climate Change in Small Island Developing States: Background paper for the expert meeting on adaptation for small island developing states. http://unfccc.int/files/adaptation/adverse_effects_and_response_measures_art_48/application/pdf/200702_sids_adaptation_bg.pdf [last accessed 17 August 2010].

United Nations International Strategy for Disaster Reduction (UN/ISDR) (2004) Living with Risk: A Global Review of Disaster Reduction Initiatives. Geneva, Switzerland: UN/ISDR.

UN/ISDR (2002) *Living with Risk – A global review of disaster reduction initiatives* (Preliminary version). Geneva, Switzerland: UN/ISDR.

UN/ISDR (2005) Hyogo Framework for Action 2005–2015: Building the Resilience of Nations and Communities to Disasters. Extract from the final report of the World Conference on Disaster Reduction (A/CONF.206/6).

UN/ISDR (2007) Disaster Risk Reduction Global Review. Geneva, Switzerland: UN/ISDR.

UN/ISDR/Umvoto (2005) Expert Meeting on Disaster Warning and Response Systems in Small Island Developing States Regions. Christ Church, Barbados, 8–9 August 2005. Available at: http://www.thecommonwealth.org/shared_asp_files/uploadedfiles/A3832604-F600-48BE-BB73-08AD426ACE6F_FinalExpertMeetingSummary.pdf [last accessed on 11 August 2010].

Resources

Books, guidelines and reports

African Union, the New Partnership for Africa's Development (NEPAD), African Development Bank and UN/ISDR (2004) *Guidelines for Mainstreaming Disaster Risk Assessment in Development*. Geneva, Switzerland: UN/ISDR.

Ariyabandu, M M (2007) *Gender issues in disaster risk reduction – an overview.* Prepared for the ISDR Gender Expert Meeting, 12–13 February 2007, Geneva, Switzerland.

Benson, C, Twigg, J, and Rossetto, T (2007) *Tools for Mainstreaming Disaster Risk Reduction: Guidance Notes for Development Organisations*. Geneva, Switzerland: ProVention Consortium, 179pp.

Briceño, S (2002) *Gender Mainstreaming in Disaster Reduction*. Panel presentation to Commission on Status of Women, March 2002. Geneva, Switzerland: UN/ISDR Secretariat.

Brown, K, Tompkins, E L, and Adger, N (2002) *Making Waves*. *Integrating Coastal Conservation and Development*. London: Earthscan.

Davis, I, Haghebaert, B and Peppiatt, D (2004) *Social Vulnerability and Capacity Analysis: Discussion paper and workshop report*. ProVention Consortium Workshop at IFRC Geneva, 25–26 May 2004, 14pp.

Disaster Mitigation for Sustainable Livelihoods Programme (2005) International Workshop on Community Risk Assessment: Workshop Report. International Workshop on Community Risk Assessment, Cape Town, 31 May–2 June 2005, 68pp.

Enarson, E (2001) *Promoting Social Justice in Disaster Reconstruction: Guidelines for Gender-Sensitive and Community-Based Planning*. Gujarat, India: Disaster Mitigation Institute of Ahmedabad.

Gomez, S and Akmatova, C (2006) *Guidelines for Gender Sensitive Disaster Management: Practical Steps to Ensure Women's Needs are Met and Women's Human Rights are Respected and Protected during Disasters*. Chiang Mai, Thailand: Asia Pacific Forum on Women, Law and Development (APWLD), 77pp.

Inter-Agency Standing Committee (IASC) (2006) Women, Girls, Boys and Men: Different Needs – Equal Opportunities. Geneva, Switzerland: UNHCR.

International Federation of Red Cross and Red Crescent Societies (2007) *How to do a VCA: A practical step-by-step guide for Red Cross and Red Crescent staff and volunteers*. Geneva, Switzerland: International Federation of Red Cross and Red Crescent Societies ((IFRC), 92pp.

IUCN (2007) Gender Aspects of Climate Change. Gland, Switzerland: IUCN.

Miamidian, E, Arnold, M, Burritt, K, and Jacquand, M (2005) *Surviving Disasters and Supporting Recovery: A Guidebook for Microfinance Institutions*. Washington, USA: The Hazard Management Unit of the World Bank, 40pp.

Mileti, D (1999) *Disasters by Design*. Washington DC, USA: National Academy of Sciences and Joseph Henry Press, 351pp.

Nelson, V, Meadows, K, Cannon, T, Morton, J and Martin, A (2002) 'Uncertain predictions, invisible impacts, and the need to mainstream gender in climate change adaptations'. *Gender and Development*, 10(2), 51–59.

ProVention Consortium and IFRC (2007) Strengthening the Social Analysis Component in Rapid Impact and Vulnerability Assessment. Workshop Report, Panama, 29–31 January 2007, 20pp.

Sudmeier-Rieux, K, Masundire, H, Rizvi, A, and Rietbergen, S (2006) *Ecosystems, Livelihoods and Disasters: An integrated approach to disaster risk management*. Gland, Switzerland: International Union for the Conservation of Nature and Natural Resources (IUCN), 57pp.

Swiss Agency for Development and Cooperation (2007) *SDC Guidelines on Disaster Risk Reduction*. Bern, Switzerland: Swiss Agency for Development and Cooperation (SDC), 19pp.

Tompkins, E L and Adger, W N (2003a) Building resilience to climate change through adaptive management of natural resources. Tyndall Working Paper, 27. Norwich, UK: Tyndall Centre for Climate Change Research, University of East Anglia.

Tompkins, E L and Adger, W N (2003b) Defining response capacity to enhance climate change policy. Tyndall Working Paper, 27. Norwich, UK: Tyndall Centre for Climate Change Research, University of East Anglia, 19pp.

United Nations (1948) Universal Declaration of Human Rights. UN General Assembly resolution 217 A [lll] 10 December 1948.

UN/ISDR (2002) *Women, Disaster Reduction and Sustainable Development*. Geneva, Switzerland: UN/ISDR, 6 March 2002.

UN/ISDR (2004) *Living with Risk – A global review of disaster reduction initiatives* (2004 version). Geneva, Switzerland: UN/ISDR.

UN/ISDR (2005) *Gender Equality in Disasters, Six Principles for Engendered Relief and Reconstruction*. Geneva, Switzerland: UN/ISDR Gender and Disaster Network.

UN/ISDR (2007) *Building Disaster Resilient Communities: Good Practices and Lessons Learned*. Geneva, Switzerland: UN/ISDR, 55pp.

UN/ISDR (2007) *Environment and Vulnerability: Emerging Perspectives*. Geneva, Switzerland: UN/ISDR, 33pp.

UN/ISDR (2007) *Gender Perspective: Working Together for Disaster Risk Reduction. Good Practices and Lessons Learned*. Geneva, Switzerland: UN/ISDR, 54pp.

UN/ISDR (2007) *Guidelines: National Platforms for Disaster Risk Reduction*. Geneva, Switzerland: UN/ISDR, 17pp.

UN Office of the Special Adviser on Gender Issues (2001) *Strategy for Promoting Gender Equality*. New York, USA: UN Office of the Special Advisor on Gender Issues and Advancement of Women.

Wisner, B, Blaikie, P, Cannon, T and Davis, I (2004) *At Risk: Natural Hazards, People's Vulnerability and Disasters*. London, UK: Routledge, 471pp.

Padma Narsey Lal

Oceans and Marine Resource Management: Ecosystem-based Management and Sustainable Development

Chapter 4

Oceans, seas, islands and coastal areas form an integral and essential component of the Earth's ecosystem and are critical for global food security and for sustaining economic prosperity and the wellbeing of many national economies, particularly developing countries.

UN, para. 20, World Summit on Sustainable Development (WSSD),
Johannesburg Plan of Implementation, 2002

Introduction

Strategic development and management of the Pacific ocean and marine resources at national and regional levels are critical to Pacific islanders' ability to meet their changing needs and aspirations and to maintain their unique lifestyle.

The Pacific region is associated with the geographical beauty of its oceans and islands, and the colourful cultures of its people. The Pacific community prides itself on the 'Pacific Way' lifestyle where communal living and reciprocal social relationships are emphasised, often at odds with the pressures of individualism encouraged by market forces. The region is going through rapid changes, mostly due to high population growth rates and the changing needs and aspirations of its population, including increasing consumerism. The Pacific people, while living in a globalised world, have strong traditional ties and are influenced by their cultural customs. However, traditional systems are gradually weakening under the forces of globalisation and market economy.

The coastal and marine environment, a source of subsistence as well as commercial activities, is an integral part of the Pacific lifestyle. The Pacific islands have ecologically diverse environments and landscapes, high biodiversity values and high endemism. In some cases, such as for coral reefs, the Pacific has the highest known diversity in the world. These qualities serve as a magnet for tourists from as far away as Europe and North America as well as the more traditional markets from Australia and New Zealand. Most countries rely on their coastal resources for tourism dollars, which in 2003 contributed about US$1 billion, or about 5 per cent of the region's GDP.

With a large exclusive economic zone (EEZ), very high sea to land ratio and relatively undeveloped natural environments, most Pacific island countries (PICs) are reliant on coastal and offshore fisheries and tourism as the main source, perhaps the only source, of gross domestic product and export earnings (Table 4.1). Pelagic tuna-based offshore fisheries contribute about 11 per cent of the gross domestic product of all PICs (Gillet et al., 2001) and account for around 50 per cent of total exports from the region. On the other hand, coastal resources are the cornerstone of subsistence and domestic economic activities, contributing about 15 per cent of the region's GDP.

Table 4.1 Land to sea area relationship in the islands of the Pacific Islands Forum

Country	*Land mass (km²)*	*EEZ (million km²)*	*Sea: land ratio*
Cook Islands	237	1.8	7,595
Fiji Islands	18,272	1.3	71
FSM	700	2.9	4,143
Kiribati	810	3.6	4,444
Marshall islands	181	2.1	11,602
Nauru	21	0.3	14,286
PNG	462,000	3.1	7
Samoa	2,820	0.1	35
Solomon Islands	28,370	1.3	46
Tonga	747	0.7	937
Tuvalu	—	—	—
Vanuatu	12,189	0.7	57

Source: http://www.faopacific.ws/Members/tabid/4723/language/en-US/Default.aspx#m2 [accessed February 2011]

Management challenges

Specific challenges in the marine sector have their origins in international as well as domestic development pressures. PICs' dependence on limited marine and other resource-based export commodities make them highly vulnerable to global forces, such as fish prices, the effects of international trade liberalisation and increasing fossil fuel prices. Many PICs are also highly prone to natural disasters, such as cyclones, earthquakes and volcanic eruptions. They need to cope with the emerging challenge of vulnerability to increased frequency and extreme climate events coupled with sea level rise resulting from global climate change. Such challenges are further exacerbated by their geographical isolation within the region, as well as from their main export markets. The small island states have many islands scattered across a large area under their national jurisdiction, with poor domestic transport infrastructure and communication adding to their challenges. Growing population in most countries and increasing emphasis on consumerism has encouraged a focus on economic development goals, with often cursory regard for their impact on the environment or on social equity.

Pacific islands are under international pressure to preserve their biodiversity and their natural ecosystems for the global good, since the Pacific is generally regarded as one of the last remaining unspoilt natural environments. The international call for the protection of key species and their habitats is often at odds with the economic development desired by the people to support their needs and aspirations and encouraged by governments. The Pacific leaders have recognised the need to balance conservation for international good and economic development for the benefit of their citizens.

Offshore tuna fisheries

One of the ongoing concerns in the region is sustainability of the tuna resources, particularly since for many countries tuna is an important source of GDP, foreign exchange and employment. The value of the catch increased from US$375 million in 1982 to US$1.9 billion in 1998 (Gillet et al., 2001). The Pacific Islands Forum Fisheries agency reports that the value of tuna caught in national waters of the Pacific region during 2009 amounted to US$2.8 billion. This can be attributed both

to an increase in the volume of catches and the price of tuna. The volume of tuna caught increased from 1.5 million metric tonnes in 1998 to 1.9 million metric tonnes in 2009. The price per tonne of tuna also increased significantly over this period. Skipjack tuna stocks are considered to be healthy, with some potential for an increase in harvest. However, the larger tunas, including yellowfin, albacore and blue-eyed tuna are considered to be fully exploited, and bigeye overexploited. Adding to the concern about declining stock is that of the effects of climate change on recruitment of some tuna species, due to El Nino and La Nina southern oscillation affecting sea temperatures. Large fluctuations in fish stock, as well as any decline in tuna catches, can have a large impact on small economies extensively reliant on fish for export earnings and their GDP.

Other issues of concern, particularly for the Pacific countries that have had a special trading relationship with the European Union (members of the African, Caribbean and Pacific [ACP] countries) include potential impact of globalisation and trade liberalisation.

For many countries, the relatively low value of returns from their tuna resources is a growing concern. Countries receive only about 5 per cent of the value of tuna harvested from the Pacific EEZ by distant water fishing fleets. The low direct benefits to the island states have meant that the domestication of tuna fisheries has been an ongoing interest. Many have considered going into joint ventures and/or encouraging domestic industry. However, the Pacific nations have so far found it difficult to realise this dream of having a local tuna fishing industry (Gillet, 2003), largely because of the financial capital and technical knowledge necessary to make it viable.

Coastal resources

Coastal resources throughout the region face serious challenges. As human population increases and national economies grow, the pressure on fisheries has gradually increased and is expected to further increase in the future, particularly around major settlements. Overfishing of target finfish and non-fish species within the range of small motor-powered boats are expected to become more common (box 4.1).

Box 4.1 Overfishing of trochus and green snail in Vanuatu

Trochus and green snails, two of the main export products from Vanuatu, are in danger of becoming overharvested. Commercial exploitation of trochus and green snail fishing began in the 1920s with the demand for raw material for buttons, jewellery, ornaments and inlay work for furniture and handicraft. The industry has grown and the processed shells are exported to Asia, which together with the smoked and dried *bêche-de-mer* (sea cucumber) fetched about US$3.7 million in the last ten years.

These marine species provide an important source of livelihood for rural isolated islands, which lack transportation, refrigeration facilities and fresh fish or agricultural markets.

However, trochus and green snails are becoming scarce on many islands and are difficult to find. A recent survey of trochus fishing suggests that the industry has almost collapsed; the only surviving shell company has reported that it cannot find enough raw material to remain viable. The few viable stocks in remote areas are also seriously endangered. Overharvesting combined with the slow growth rate of the green snail make it particularly vulnerable to extinction.

The government has placed a ban on green snail exports and enforced it, but the population of snails is not showing signs of recovery. Efforts to transplant brood stocks of green snails have not been successful. Similarly, mariculture of trochus and the release of larvae on outer reefs have been attempted but as yet population increase has not been observed.

Source: Lovell et al., 2004: p. 350

The pressure on coastal resources is expected to increase with changing international demands for key fisheries products from the Pacific (box 4.2).

Box 4.2 Impact of rising prices and overfishing of bêche-de-mer in Marovo Lagoon, Solomon Islands

In Solomon Islands, the harvesting of bêche-de-mer is a multi-million dollar industry, second only to tuna as the country's most valuable marine resource. The ease of gathering and processing bêche-de-mer has resulted in it becoming one of the largest sources of cash in many coastal communities throughout Solomon Islands. Bêche-de-mer, is highly regarded in Asia as a delicacy with powerful qualities as a traditional medicine and aphrodisiac. In addition, it is an important source of protein for Solomon Islanders, who have one of the highest per capita seafood consumption rates in the world with over 80 per cent of the population deriving their protein from marine resources. Bêche-de-mer is an important source of livelihood for coastal villagers; during the recent political crisis, it was one of the few stable sources of income.

Increased demand for bêche-de-mer, resulting in higher prices, has in recent years led to overharvesting and a decline in stock of some species. In 1991 one species, the white teatfish, was valued at 30 Solomon Islands dollars (SI$) a kilo but by 2004 this had gone up to about SI$220–270 a kilo. With this increase in price, the teatfish has been overharvested to the extent that its catch has recently decreased. In 1999, more than 50 per cent of the total bêche-de-mer catch was white teatfish but by 2002 this species accounted for only 2 per cent. Catches and exports have fallen from 715 tonnes in 1992 to less than half this figure in 2005.

Rising prices have also led to an increase in dangerous fishing practices. 'Ten years ago people were happy to free dive or simply collect the sea cucumbers at low tide. Now people are night diving with torches, using weighted "bombs" with steel barbs, and even using dredges to harvest from deeper waters' (Ramofafia, a bêche-de-mer specialist from Marovo Lagoon, quoted in Menzies 2005). The growing use of 'hookah', or diving using air compressors and long hoses, has been noted to have contributed to a growing number of deaths in the Western Province.

Source: Adapted from Steve Menzies, IWP Project Media release 7 July 2005. Available at: www.sprep.org; [last accessed 29 October 2005]

One of the net effects of overfishing of key species is the shift in the dynamics of coral reefs and natural ecosystems. The reefs have become more susceptible to overgrowths by macro-algae and plagues of coral predators, such as crown of thorn. Other pressures include the impact of land-based activities; sediments from poor land use, deforestation and dredging smother coral reefs and reclamation of mangroves and other habitat affecting coastal productivity and species composition. Nutrient and chemical pollution from untreated and poorly-managed human sewage and animal wastes, contaminants from agriculture as well as in limited cases industrial pollutants all have a negative impact on coastal ecosystems. Such effects are often localised and their cumulative effects can vary from low to very high within a country (table 4.2).

Table 4.2 Perceived local threats and severity of those threats to some selected coral reefs of Fiji

Reef area	*Coastal development*	*Pollution*	*Sedimentation*	*Overfishing*	*Destructive fishing*	*Overall*
Tavueni/Somosomo	None/low	Medium	Low	Low	None	?
Suva	Medium	High	High	High	Medium	Very High
Beqa	Medium	None/low	Low	High	Low	Medium
Coral Coast	Medium	None/low	High	High	High	High
Mamanucas	Medium	Low	Medium	High	Low	Medium
Lautoka	Medium	High	High	High	Medium	Medium

Source: Lovell, Sykes et al., 2004: p. 341

Countries differ in the degree of risks local habitats may be exposed to (table 4.3).

Table 4.3 Variation in risk level of coral reefs in selected countries

	Reef Area (sq km) by degree of risk				*Percentage under risk*			*Marine protected area*	
	Total (km²)	*Low*	*Medium*	*High*	*Low*	*Medium*	*High*	*No.*	*Area (km²)*
Fiji*	10,000	3,360	4,800	1,900	34%	48%	19%	1	1
French Polynesia	6,000	4,900	1,100	0	82%	18%	0%	1	124
Marshall Islands*	6,000	4,900	1,100	0	82%	18%	0%	2	163
New Caledonia	6,000	5,800	200	0	97%	3%	0%	5	530
PNG	12,000	6,000	4,500	1,500	50%	38%	12%	8	2149
Solomon Islands	6,000	3,000	2,500	500	50%	42%	8%	—	—

Source: Bryant et al., 1998, p. 34; http://pdf.wri.org/reefs.pdf [accessed 31 January 2011]

In addition to human activities within their own borders having major effects on ecosystems, global activities have far reaching impacts on the Pacific people. Coastal ecosystems and coral reef-based activities are particularly under threat from the effects of climate change. Global climate change effects not only include more frequent switches in El Nino and La Nina events, but also an increase in the frequency and intensity of tropical storms. Furthermore, climate change is expected to result in increases in dissolved carbon dioxide in water, which is believed to cause coral bleaching and coral mortality. Major bleaching was reported in 1998, 2000 and 2002. The 1998 global coral bleaching alone led to a loss of 16 per cent of the worlds' coral reefs, including some of those in the Pacific. Fiji reported serious coral bleaching in 2000 and 2002, with 40–80 per cent of coral mortality on many reefs. Although some recovery has been reported, it is slow in some damaged areas, such as Beqa Barrier Reef and the western Astralobe reefs. Overall only about 10 per cent of the coral reefs affected by bleaching in the SW Pacific during 2000–2002 have recovered to their pre-bleaching levels (Lovell, Sykes et al., 2004).

Coral reefs and other habitats are under constant threat from wave and wind actions caused by extreme weather events, as has recently been experienced by countries such as Samoa, Nauru and Niue. Cyclone Heta in 2000, for example, caused damage to some 13 per cent of coral reefs in Samoa. In 2003, Nauru experienced major coral bleaching and mass fish kills, due possibly to elevated sea level temperatures.

Such changes in the coastal ecosystems can have far reaching effects beyond the decrease in the availability of fish. They can undermine the tourist industry, which relies on the diverse vibrant and healthy corals supporting a large variety and abundance of colourful coral and fish species and the presence of megafauna, such as sharks, manta rays and turtles. For countries such as Cook Islands where tourism is the backbone of the local economy, such changes can have a drastic impact on people's livelihoods. To address such pressures on oceanic and marine resources, including coral reef and other coastal ecosystems, a more stringent and strategic management based on an ecosystems approach underpinned by robust information is important. This will become more acute over time as population increases and global attention shifts towards the last remaining relatively healthy tuna stocks and more dynamic coastal ecosystems.

Management responses

For Pacific islands, management of their domestic oceanic and marine resources, national and regional approaches have been adopted. Meeting the ever-increasing pressure from distant water

fishing nations for increased access to pelagic resources, the PICs have generally taken a regional approach without necessarily compromising their sovereign rights and interests. Much of the research and policy discussions have been supported by the activities of two particular regional agencies, Forum Fisheries Agency (FFA) and the Secretariat to the Pacific Community guided by their governing councils. These agencies hold annual scientific as well as policy meetings to guide member countries in their deliberation and negotiations with distant water fishing nations. Since 2006, this has also been carried out in the context of the Western and Central Pacific Tuna Commission, which includes distant water fishing nation representatives as members.

National programmes and policies to address such challenges vary across the region. Management of coastal and ocean resources has predominantly been sectoral in nature. Generally, environmental aspects of the coastal and marine sector are managed independently of the fisheries sector. Not only is the fisheries management addressed independently of environmental issues, agencies managing different aspects of the marine sectors are separate and operate under the different legislations, with little or no co-ordination. Thus, for example, fisheries harvest in Fiji is managed by the Fisheries Department under the Fisheries Act, while the coastal mangrove resources, which are important nursery grounds for fish, are managed by the Forestry Department under the Forestry Act. Pollution of coastal waters is either addressed under the Public Health Act, or by the municipal council under the Town and Country legislation. There has also been some effort made to use other instruments such as Environment Impact Assessment (EIAs) to screen projects. These EIAs, however, have usually been applied by the department of environment to very large projects, if at all.

The activities of these different organisations are often not co-ordinated, largely because each department operates within its narrow legislative mandate and there are no cross-cutting institutional mechanisms for co-ordination of management response. In most cases, management relies on a 'top-down' regulatory approach, using command and control strategies. In the case of coastal fisheries, instruments such as licences, size limits, bans on the harvest of certain species, restrictions on gill net mesh sizes or restrictions on equipment are commonly used. These have generally been found to be ineffective, largely because government fisheries departments often do not have adequate resources for monitoring and enforcement, and penalties are inadequate to act as a deterrent (box 4.3).

Box 4.3 Management of bêche-de-mer in Solomon Islands

'Economically, bêche-de-mer is a very important resource for Solomon Islands, but the government's "top-down" approach to management has not worked. The government does not have the capacity or resources to enforce regulations such as size limits, bag limits, equipment restrictions and seasonal closures. There are no national regulations or guidelines to safeguard the industry, except for a 1998 ban on fishing for sandfish, which was repealed in 2000'. At the same time, the resources are owned communally under the traditional system of tenure, but coastal communities do not have much say in the management of those resources.

It is generally acknowledged that the only way 'to protect these resources is to actively involve fishing communities and resource owners in developing and implementing their own management strategies'. Some have argued that the management of these resources should be transferred to communities and that they should be responsible for enforcing regulations. 'These regulations should be implemented in accordance with the local system of customary marine tenure and the national government should develop policy and regulatory frameworks that help to support this community-based management'.

Source: Adapted from Steve Menzies, IWP Project Media release 7 July 2005. Available at: www.sprep.org [last accessed 29 October 2005]

Recently, countries such as Samoa, Tonga and Cook Islands have adopted integrated coastal zone management strategies and plans, although their implementation has generally suffered from lack of resources and co-ordination between government agencies.

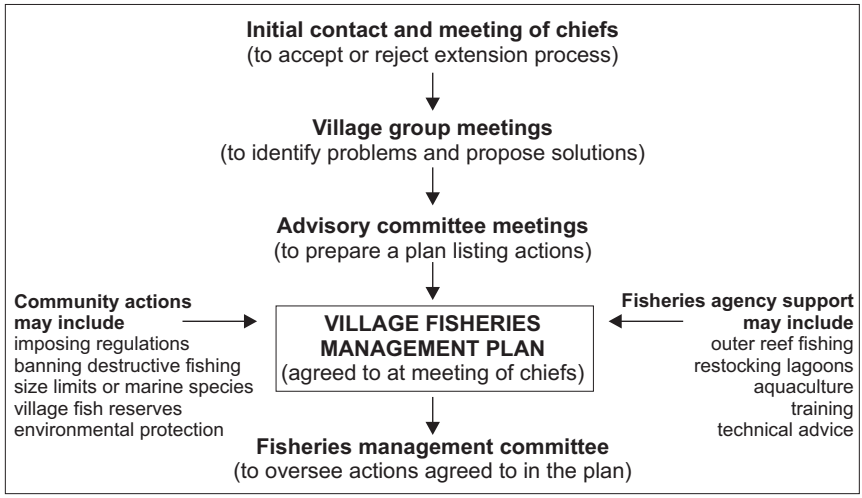
Some effort has recently been made to encourage greater community participation in coastal fisheries development and management, particularly with the assistance of development partners. Projects such as the AusAID-funded Samoan Fisheries Development Project (box 4.4), Fiji Local Level Management Areas (FLLMA), and conservation area projects in Vanuatu under the Global Environment Facility (GEF)-funded South Pacific Biodiversity Conservation Projects are examples. In places like Fiji, local community members are trained and hired as fisheries wardens to increase effectiveness of the regulations. Such efforts have taken sectoral approaches, with little co-ordination between different initiatives. In many instances, the link between coastal zone management initiatives, national development planning and budgetary processes is limited at best, non-existent in most cases.

Box 4.4 Community-based fisheries development and management in Samoa

In Samoa, community-based fisheries development and management has been developed with the assistance of the South Pacific Commission (SPC) and AusAID. The project strategy was based on the following four principles:

- Maximum community participation
- Motivation not education
- Demand-based assistance with extension services
- Development of alternative sources of seafood where stock is under threat of depletion

In such a process, scientists and government officials provide technical backstopping and play a facilitation role where necessary. They also help link the community efforts, rules and regulation with the national level 'formal' process, thereby giving the legislative basis for the local level management. The process follows is summarised in the diagram below:



Source: King and Faaisili, 1999

Regional response

The Pacific region has several regional intergovernmental organisations that provide technical advice to assist independent island nations and territories to manage their coastal and marine resources and offshore tuna fisheries. However, countries face major challenges in making the most effective use of regional support. Nor do the regional programmes necessarily address the country-specific priority issues, with regional projects often depending on the availability of development partner support, which in many instances is for programmes that reflect international or regional interests.

Regional marine resource and environment-related projects are primarily implemented by the South Pacific Regional Environment Programme (SPREP), Pacific Islands Applied Geoscience Commission (SOPAC), FFA and SPC, with the Pacific Island Forum Secretariat (PIFS) co-ordinating and providing policy advice to the leaders. These agencies tend to focus on areas of immediate interest, as mandated by their governing councils. SPC, the primary regional organisation responsible for marine living resources, has until recently focused on coastal and offshore fisheries development and capacity building activities. FFA, on the other hand, has focused on helping countries with primarily offshore tuna fisheries management, including access negotiation, and technical backstopping in relation to monitoring and stock assessment (in collaboration with SPC). SOPAC deals mainly with non-living aspects of the EEZ, including mapping mineral resources and defining maritime boundaries. SPREP addresses environmental aspects of the oceanic and marine resources, including climate change effects and protection of key species such as whales and turtles.

With limited member contributions, each of the regional organisations largely relies on support available from development partners and UN agencies under various multilateral environment agreements. As a result, their activities have tended to be stand-alone projects supported by development partners under different international instruments, particularly the GEF established after the Convention on Biological Diversity (CBD) 1992.

Many of the regional activities have focused on research, capacity development or developing regional strategies for action. These projects have included the UNDP GEF-funded National Environmental Management Strategies (NEMS) project, national biodiversity strategic action plans (NBSAPs), South Pacific Biodiversity Conservation Programme (SPBCP), National Adaptation Programme of Action (NAPAs), Comprehensive Hazard and Risk Management (CHARM) and the Pacific Islands Climate Change Assistance Programme (PICCAP).

To a large extent, the Council of Regional Organisations in the Pacific (CROP) agencies developed projects on themes that were of particular interest to development partners and funding opportunities. In this regard, one may categorise them as supply-driven. Projects did broadly reflect regional concerns, although this is slowly changing. In some cases, specific activities were carried out in response to national requests.

Overall, regional projects have produced some valuable information, many technical reports and have increased local awareness of specific resource and environmental management issues. However, many of these projects do not seem to have delivered on their stated objectives or produced the desired outcome. Reviews by some project teams and review teams have concluded that their projects have been ‘less than satisfactory’ considering the desired national level outcomes. For example, in the 1990s PICs developed their NEMS which incorporated strategies to strengthen environmental institutions, including those dealing with oceans and marine resources, identified supporting environmental legislation and environmental policy, and suggested means

for countries to implement global and regional agreements and to raise environmental awareness. However, 'most NEMS failed to properly address the institutional enabling environment and linkage [between sectoral governmental agencies] dealing shortfalls common to all Pacific Island Countries and Territories (PICTs), and required for holistic implementation of the separately promoted strategies' (SPREP-UNDP, 2005 para. 17). A similar outcome was observed in more recent efforts, such as the development of national biodiversity strategic action plans (NBSAPs). Regional fisheries aquaculture projects, such as for giant clam, implemented with the support of the SPC and the International Centre for Living Aquatic Resources Management (ICLARM, now WorldFish), did not produce the desired replenishment of the giant clam on coral reefs for subsistence and much-needed income. If anything, the giant clam populations continue to be depleted. Reasons for this could include a focus on technical aspects of culture, without explicitly considering the slow growth rate, marine tenure or market conditions (Lal and Keen, 2002).

Other reasons include the inappropriate project design, projects that did not adequately reflect considerations of the science–economics–policy continuum. In some cases, projects were designed on the basis of traditional management systems, disregarding the weakening of these systems, increasing individualism and erosion of traditional principles of reciprocity and redistribution (South et al., 2004).

This is expected to change with the adoption of ecosystem-based management (EBM) by the FFA and SPC. However, an operational challenge remains as to how this can be holistically and systematically applied.

In conclusion, the challenge of integrating science-focused projects into national policy process, as well as mainstreaming sectoral programmes into national level planning and budgetary process, remains a common theme in all areas of natural resource and environment management throughout the region. Successful completions of technical projects, albeit in the limited sense of scientific outputs, are noteworthy achievements supported by the CROP agencies. However, without also addressing associated policy analytical issues and institutional enabling environments, as well as social dynamics and incentive structures necessary to encourage individual behavioural change, such efforts are likely to continue to produce 'less than satisfactory' outcomes.

These issues have recently been recognised by the CROP agencies and have at least explicitly reflected their considerations in the different regional policies, frameworks for action and plans of action that have been developed in the last three years. The challenge remains in putting these regional frameworks into operation at the national level.

Regional policies and action plans

With the support of various development partners, particularly AusAID and NZAID, the CROP agencies helped member countries to develop various regional policies, frameworks and plans of actions, including Pacific Islands Regional Oceans Policy (PIROP). Regional policies and plans of action tend to reflect issues that have been emphasised in various international agreements as well as the lessons learned from past development efforts in the region (table 4.4). However, although many of these instruments have some relevance to coastal and marine resources and environment management, efforts to implement them have generally not been systematic, programmatic or holistic as agreed to in the Mauritius Strategy for the Implementation (MSI) of Barbados Programme of Action and Johannesburg Plan of Implementation (JPOI). Nor has there been much effort made to appropriately sequence the development efforts to produce synergistic impacts or achieve the desired outcome.

Table 4.4 Principles, themes, objectives and strategies of key regional policies, frameworks and plans of action

Regional policies, frameworks and plans of action	*Key principles, themes, objectives and strategies*
Pacific Islands Regional Oceans Policy	• Improve the understanding of the oceans • Sustainably developing and managing the use of ocean resources • Maintain the health of the oceans • Promote the peaceful use of the ocean • Creating partnerships and promoting co-operation *Source:* Forum Secretariat: CROP Marine Sector Working Group, 2002
Natural Disaster Risk Reduction and Disaster Management Framework, 2006–2015	• Improve governance – organisation, institutional, policy and decision-making frameworks • Improve knowledge, information, public awareness and education • Undertake analysis and evaluation of hazards, vulnerabilities and elements of risk • Adopt a holistic approach that includes planning for effective preparedness, response and recovery • Develop effective, integrated and people-oriented early warning system • Reduce underlying risk factors *Source:* SOPAC, 2005
Solid Waste Management Strategy	• Develop and implement appropriate waste management infrastructure • Develop practical sound and effective waste management policies, legislations and regulations • Implement appropriate communication strategies to support effective waste management activities • Develop mechanism that will support waste management in a financially and economically sustainable manner • Develop national capacity to assist Pacific islanders to manage their waste in an environmentally sustainable manner *Source:* SPREP, 2005
Pacific Regional Action Plan for Sustainable Water Management (Pacific RAP)	• Water resource management – water resource assessment and monitoring, rural water supply and sanitation, integrated water resource management and catchment management • Island vulnerability – disaster preparedness, dialogue on water and climate • Awareness – advocacy, political will, community participation, environmental understanding, gender • Technology – appropriate technologies, demand management and conservation, human resources • Institutional arrangements – institutional strengthening, policy, planning and legislation • Financing – costs and tariffs, alternative models, role of donor organisations and financing institutions *Source:* SOPAC & ADB, 2003

Implementation of these regional policies at the national level is the next challenge. It will be necessary to bring together appropriate government agencies, community-based stakeholders and development partners to identify and implement an interdisciplinary programme of activities to achieve the desired outcomes in a most cost effective manner.

International response

Pacific small island developing states (SIDS) have also responded to international calls and endorsed various instruments, such the Law of the Sea, MSI and JPOI. Common elements of these international fora include the need for national sustainable development strategies reflecting:

- a balanced focus on the three pillars of sustainable development – economic wellbeing, environmental conservation and social harmony,
- a programmatic 'whole-of-country' approach to development and management,
- the use of market-based financial instruments together with a command and control approach, including legislation, to address environmental problems, and
- adopting a participatory process to improve integrated decision-making processes and environmental governance at all levels.

In many instances, international commitments have not been translated in national legislations or actions. In the Pacific, for example, where commitments have been translated into national plans, 'traditional sector-based development plans and policy making struggle to cope with the complexity of environmental and natural resources management concerns. There is also growing appreciation of the importance of traditional practices and norms and securing an appropriate means of blending local knowledge and aspirations into development strategies'. (McIntyre and Wilson, 2004: 250; Box 4.5).

Box 4.5 Community-based and integrated resource management in Vanuatu

The Taagbe River Catchment Area near Port Vila, the capital city of Vanuatu, exemplifies the high degree of complexity involved in the development of truly integrated and community-based approaches to development planning and programming. The case study finds an urgent need for measures to deal with a wide range of resource management issues (for example, water resources protection and waste management) that confront a rapidly expanding city like Port Vila, and recommends an approach that incorporates local needs and desires and works through strengthened government planning authorities. It however notes that there are likely to be difficulties in restructuring regulatory relations between the national and local planning and environment offices, while at the same time allowing for the incorporation of community interests and traditional knowledge and practices at all stages of the decision-making process.

Source: McIntyre and Wilson, 2004
http://www.adb.org/Documents/Studies/PRES/pres-vol2.pdf [accessed February 2011]

Only in limited cases has a national action followed a specific international commitment. In such cases, the implementation of the action has not necessarily followed, as was the case in Fiji with the live coral trade (Convention on International Trade of Endangered Species [CITES], 2002; Fiji Government, 2002.) Where national legislation has been passed consistent with international commitments, these are not always implemented. If implemented, enforcement is weak, as has been the experience with the EIA requirements for development projects. National capacity in the departments of environment is often low, and the majority of time is spent either attending

international meetings or preparing reports to meet the requirements under the multilateral environmental agreements (MEAs). Little time or resources have been available for actual implementation of a work programme.

In some cases, the international communities have encouraged community-based development efforts in response the lack of success at the top-down driven development and conservation assistance. Such top-down development efforts were often driven by political interests rather than national priorities. Internationally, this led to greater emphasis on stakeholder-based development planning and implementation.

At one end of the spectrum were community-based activities, which by nature were focused on addressing local issues of importance. These projects, as seen earlier, had mixed success for several reasons, including lack of adequate considerations of equity issues in the design of the project as well as the scope for rent seeking and free rider behaviour. In some cases, the principle agent problem led to the demise of community-based projects. These projects did not include strategies for nationalising their experiences and lessons learned. Consequently their impact remained small, despite large sums having been spent. At the other end of spectrum, greater emphasis was placed on community consultation and stakeholder-based planning processes, such as for developing a national sustainable development strategy (discussed below).

The piecemeal and ad hoc approach to development assistance was identified by member countries in their report to the WSSD and the MSI. This is not unique to Pacific SIDS.

In summary, the ocean and marine resource governance challenges outlined above are multifaceted. Although the details may vary between sectors and across member countries, there is a common set of governance challenges at the national level, regardless of which issue, which sector or theme is considered. These include:

- ensuring priority funding to assessment of environmental impact of economic development on coastal and marine zones,
- linking sectoral and thematic priorities to national planning and finance, and
- integrating national- and community-based planning processes.

Regionally, the key challenges include:

- lack of co-ordination of support among different regional organisations,
- limited integrated science–economics–social analysis to underpin development and management advice, and
- lack of a programmatic approach to regional services.

Internationally, the challenges include:

- limited co-ordination of development support provided by different international agencies organisations, and
- external support seldom reflects national development goals and priorities.

Way forward

The PICs acknowledge that national sustainable development goals cannot be achieved without assistance from international developments partners and regional organisations. Learning from the past efforts – successful and otherwise – the region has recently embarked on some key initiatives that show particular promise in overcoming some of the key constraints to achieving sustainable natural

resource and environment management. These include a shift towards improving the decision-making process at all levels by developing national sustainable development strategies (NSDS). This will place greater emphasis on community-based management linked to national government efforts, utilising economic and financial instruments and making a shift towards EBM.

The endorsement of the Pacific Plan by the Pacific leaders in October 2005 could help improve co-ordination, collaboration of services to member countries among regional organisations, as well as with other development partners. Internationally, the adoption of the Paris Declaration for Aid Effectiveness, and adoption of national planning and budgetary processes linked to sectoral and cross-cutting thematic plans, and priorities based decision-making processes, show promise in countries. Through the national sustainable development strategy (NSDS), linked sectoral priorities and budgetary process, countries are more likely to effectively utilise external support to complement their own efforts to help meet the needs and aspirations of their people.

NSDS

In response to the growing awareness of key constraints to sustainable development, the PICs have endorsed the need to adopt NSDS processes to improve their national planning and budgetary process. It is hoped that the adoption of these processes will improve their decision-making at national, sectoral and community levels, reflecting the core principles of sustainable development and good governance.

As promoted in the WSSD, a sustainable development strategy is a set of co-ordinated mechanisms and processes that collectively offer a participatory approach to develop vision, goals and targets for sustainable development and to co-ordinate their implementation and review. In a national sustainable development strategy process, there is emphasis on:

- society as a whole having the responsibility for development,
- a participatory process involving all relevant stakeholders, an 'holistic', 'whole-of-country' and cross-sectoral level planning and management, and
- a shift from a focus on outputs (projects, legislations, plans) towards a focus on systems and outcomes (impacts) on people, an adaptive process that is continuously being reviewed and improved.

Countries such as Samoa, Fiji, PNG and Tuvalu have taken first steps towards this by adopting a participatory approach to developing their NSDS.

For the marine and coastal sectoral planning process, the use of EBM approach could help address both the issue of institutional misfit between ecological connectivity and the government institutions arrangements. PICs have endorsed in principle the EBM approach to coastal and offshore fisheries management. Ecosystem management is a process that integrates biological, social and economic factors into a comprehensive strategy aimed at protecting and enhancing sustainability, diversity and productivity of our natural resources. The Ecological Society of America has identified eight key elements of EBM (box 4.6) and four key guiding principles.

Box 4.6 Core elements and guiding principles of ecosystem-based management

Core elements

Sustainability: ecosystem management does not focus primarily on deliverables, but rather regards intergenerational sustainability as a precondition.

Goals: ecosystem management establishes measurable goals that specify future processes and outcomes necessary for sustainability.

Sound ecological models and understanding: ecosystem management relies on research performed at all levels of ecological organisation.

Complex and connectedness: ecosystem management recognises that biological diversity and structural complexity strengthen ecosystems against disturbance and supply the genetic resources necessary to adapt to long-term change.

The dynamic character of ecosystems: recognising that change and evolution are inherent in ecosystem sustainability, ecosystem management avoids attempts to freeze ecosystems in a particular state of configuration.

Context and scale: ecosystem processes operate over a wide range of spatial and temporal scales. Their behaviour at any given location is greatly affected by surrounding systems. Thus, there is no single appropriate scale or timeframe for management.

Humans as ecosystem components: ecosystem management values the active role of humans in achieving sustainable management goals.

Adaptability and accountability: ecosystem management acknowledges that current knowledge and paradigms of ecosystem functions are provisional, incomplete and subject to change. Management approaches must be viewed as hypotheses to be tested by research and monitoring programmes.

Guiding principles

Partnerships and citizen participation: work together with citizens, landowners, businesses, local governments, interested organisations and other agencies to address issues, identify opportunities and find common solutions.

Science-based approach: use the best available scientific knowledge (ecological, social, and economic) as a foundation for decision-making, understanding natural resource relationships, and focuses on sustainability of ecological systems.

Long-term view: establish targets and long-term goals for desired ecosystem conditions that maintain the capacity of the land to sustain public benefits and opportunities into the future.

Comprehensive perspective: find solutions that support economic prosperity, lasting livelihoods and ecological health and sustainability.

Source: Ecological Society of America (2005) 'Principles of Ecosystem based Management' and 'Overview of Ecosystem Based Management'. Available at: http://www.michigan.gov/dnr [last accessed 30 October 2005]

The principles articulated in EBM are in many respects similar to the core guiding principles identified in the various regional policies, frameworks of action and plans already endorsed by the region. When adopting the EBM approach, for example, under the Pacific Islands Oceans Regional Policy (see below), in the management of coastal mangroves it would be necessary to address each of the elements of the three pillars and the interactions among them as well as the underlying foundational institution, such as communal resource ownership, use and management rights (as summarised in figure 4.1). It would also be necessary to identify management strategies that would include organisational co-operation as well as economic instruments complemented by formal rules and regulations, supported by appropriate legislations and bylaws.

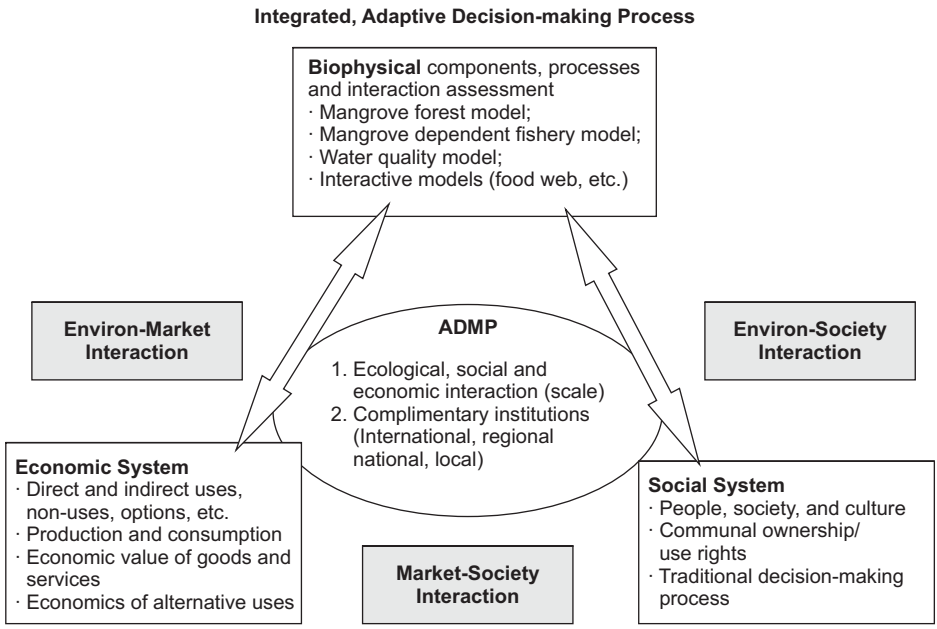


Figure 4.1 EBM framework for making integrated adaptive decisions
Source: Lal, 2003

Such an approach will help systematically identify and analyse:

- Relevant government stakeholders, community stakeholders including resource owners, and users who need to be involved in decision-making processes.
- The dynamics of and interactions between resource/environment and society, market and society, as well as market forces and environment. This is so as to identify root causes of observed resource and environment status, and to identify appropriate management strategies at national, regional and local levels.

The adoption of such an approach will help managers take into account the science–economics–policy analysis spectrum, together with the appropriate management approaches that reflect incentive-based management as well as command and control.

Several agencies in the region have explicitly embraced EBM, including the FFA and the World Wildlife Fund-Fiji (WWF-Fiji). The FFA, as part of its corporate plan in 2004, explicitly identified

ecosystem-based tuna fisheries management, and is working on developing specific country-focused work programmes. WWF-Fiji is currently working with one of the local communities in the north of the island to develop a community-based network of marine protected areas, adopting the EBM framework.

Although EBM is in its early days, it does show promise in bringing together a number of apparently disparate strands. These include the participatory, 'whole-of-country', interdisciplinary and inter-sectoral, and programmatic approaches that reflect the local and national social, economic and institutional context. It also brings in international commitments made by member countries.

With the adoption of the NSDS-linked sectoral plan and priority guided by the EBM approach, member countries hope to be in a strong position to systematically mainstream the three pillars of sustainable development at all levels. This could help:

- increase the effectiveness of limited national resources by directly linking national priorities to sector and community level priorities,
- increase the transparency and the accountability of the government's budgetary decisions and development efforts,
- guide a country in accessing development partner assistance that is consistent with the national priorities and that complements their own efforts, and
- minimise the transaction cost of dealing with development partner assistance, by serving as a platform for confidently negotiating with development partners, encouraging more joint, or at least co-ordinated and complementary, activities.

In effect, the use of the NSDS–EBM approach can help PICs in directly taking ownership of their own national development. Such an approach is expected to help countries better co-ordinate and complement their own development efforts with those provided by development partners towards addressing high-priority projects and programmes.

Regional co-ordination and the Pacific Plan

The Pacific island states have endorsed PIROP, prepared with the assistance of regional organisations and development partners, to 'promote the Pacific region as an ocean environment in support of sustainable development.' The policy is based on the region's collective awareness of the transboundary and dynamic nature of the Pacific ocean, the increasing number and severity of threats to its long-term integrity, and the reality that sustainable economic and social development will be dependent on wise use of the ocean and its resources. It is also based on our awareness of the potential for fragmentation of programmes and for conflicting commitments in different sectors as ocean-related activities increase. This requires more regional collaborative arrangements among communities.

Although PIROP was endorsed in 2004, its implementation at the national level has been limited to ad hoc individual projects, usually externally supported. PIROP needs to be operationalised at the national level, with countries systematically developing their own policy that reflects the guiding principles articulated in the PIROP. These national action plans for ocean and marine resources would be linked to their national development plans, NSDSs or equivalent and national budgetary processes.

Conclusion

The Pacific member countries are in a stronger position to systematically address their national development goals more effectively using their own resources and development partner support, as recognised in their vision statement. With the strengthening of their NSDS and the NSDS-linked oceans and marine sector action plan, countries would be in a strong position to address their people's needs and aspirations using their limited domestic resources, as well as co-ordinating and managing development partner assistance and improving aid effectiveness.

Sustainable development is a national responsibility, but due to limited financial and human recourses, the PICs acknowledge that they cannot achieve this without support from development partners and regional government and NGOs. In the case of ocean and marine resources, it is particularly relevant due to the area's ecological connectivity.

To realise the vision of a peaceful region, sustainable development of their natural resources and environment is central. Through sustainable development, countries in the long run can expect to achieve their national development goals of poverty alleviation, equitable distribution of economic wealth, minimising local conflict and threats to national security. In this globalised world, and with the connectivity between the environment, economy and social systems, challenges in natural resource and environment management are multidimensional, covering issues at local, national, regional and international levels.

One of the key obstacles to sustainable development in the Pacific relates to the unco-ordinated set-up of institutional and governance structures and decision-making processes at all levels. At the national level, key constraints relate to institutional issues, such as the lack of co-ordinated policies, strategies and lack of integrated planning systems that encourage mainstreaming of environmental and social considerations in economics decision-making, as well as mainstreaming economic and social issues in environmental protection decisions. The mandate for the three pillars often rests among different organisations. Organisational arrangement is fragmented, with different government agencies focused on different sectors, issues and policy aspects, a legacy of their colonial heritage.

Over the last 15 years in particular, PICs have acknowledged that social and economic development is inextricably linked with sustainability of land and marine resources and the environment. Long-term sustainability of their economic wellbeing is dependent on conservation (i.e. wise use and management) of marine- and land-based resources and environment. They also recognise that human health, particularly in atoll island states, is directly influenced by environmental pollution resulting from poor management of wastes of human and animal origin. In the long run, resilience of the local economies and communities to external natural and market forces relies on the health of the environment and the economy, and their capacity to respond to and recover from the effects of these influences.

Realising the interdependence of social and economic wellbeing and environmental health, the PICs have embraced the principles of sustainable development and good governance. The countries also acknowledge that the overarching objectives and essential requirements for sustainable development are poverty eradication, changing unsustainable patterns of production and consumption and protecting the natural resource base of economic and social development. Bringing about such changes requires a broad stakeholder consultation and participation in the decision-making process. At the regional and international level, there is a growing awareness of the need for increased co-ordination and collaboration among the donors and service providers.

A number of declarations, regional policies and frameworks and strategies have been developed to identify what needs to be done.

The time has come to focus on the 'how' aspects of operationalising sustainable development, regional policies and frameworks, as well as internationally agreed guiding principles for donor harmonisation at the national level.

To ensure countries can cost-effectively achieve their desired national development goals, a change in policy focus of decision-makers at all levels, as well as a shift towards a programmatic approach to development and the adoption of ecosystem-based adaptive management, is required. Such a shift is needed at the national level, as well as in regional and international organisations.

A beginning has been made. The PICs have taken the first few steps towards adopting a two-pronged approach to national development – participatory national sustainable development strategy-based planning and resource allocation at all levels, and participatory community-based economic development and environment conservation. These can be further built on with the assistance of regional organisations and the support of development partners under the Pacific Plan.

References

Bryant, D, L Burke, J McManus and M Spalding (1998) *Reefs at Risk: a map-based indicator of threats to the world's coral reefs*. Washington DC: World Resources Institute, International Centre for Living Aquatic Resources Management, World Conservation Monitoring Centre and United Nations Environment Programme 1998. See: http://pdf.wri.org/reefs.pdf [accessed February 2011].

Ecological Society of America (2005) Principles of Ecosystem Based Management. Available at: http://www.michigan.gov/dnr [last accessed 30 October 2005].

Forum Secretariat (2002) Review of Regional Initiatives and Priorities in the Marine Sector. Working Paper by CROP Marine Sector Working Group [Draft].

Gillett, R M, M McCoy, L Rodwell and J Tamate (2001) *Tuna: a key economic resource in the Pacific*. Manila: Pacific Studies Series, ADB, FFA. p. 95.

Gillet, R M (2003) Domestic Tuna Industry Development in the Pacific Islands; the current situation and considerations for future development assistance. Honiara, Solomon Islands: FFA Report 03/01.

King, M and U Faasili (1999) Community-based management of subsistence fisheries in Samoa. pp. 133–144. *Fisheries Management and Ecology*, Volume 6, pages 133–144, April 1999.

Lal, P N (2003) Integrated and Adaptive Mangrove Management Framework – an action-oriented option for the new millennium. In de L D Lacerda (ed.) *Mangrove Ecosystems: functions and management*. Berlin, Heidelberg, New York: Springer-Verlag.

Lal, P N and M Keen (2002) Economic Considerations in Community Based Resource Use and Management. *ANU Development Bulletin*, number 58. pp. 68–71.

Lovell, E, H Sykes et al. (2004) Status of coral reefs in the southwest Pacific: Fiji, Nauru, New Caledonia, Samoa, Solomon Islands, Tuvalu and Vanuatu. pp.337–361 in C Wilkinson (ed.) *Status of Coral Reefs of the World,* volume 2. Queensland, Australia: Australian Institute of Marine Science.

McIntyre, Matt and Craig Wilson (2004) 'Mainstreaming Environmental Considerations and Traditional Knowledge and Practices into Policies and Programs for the Mele Catchment Area in Vanuatu'. Chapter 6 of Volume 2, *Pacific Region Environmental Strategy 2005–2009*. Asian Development Bank, Manila, Philippines. Available at: http://www.sprep.org/att/publication/000428_Vanuatu_Case_Study___mainstreaming.pdf [accessed February 2011].

South Pacific Applied Geoscience Commission (SOPAC) and Asian Development Bank (ADB), February 2003, Pacific Regional Action Plan on Sustainable Water Management (in preparation for the 3nd World Water

Forum Kyoto, Japan, 2003). Available at: http://www.sprep.org/att/IRC/eCOPIES/Pacific_Region/7.pdf [accessed February 2011].

SOPAC (2005) SOPAC NewsUpdate #037, 22 March 2005. Available at: http://www.sopac.org/data/virlib/SU/SU0037.pdf [last accessed August 2005].

Soulè, Michael E, and John Terborgh (eds.) (1999) *Continental Conservation: Scientific Foundations of Regional Reserve Network*. Particularly Chapter 3 'The Role of Top Carnivores in Regulating Terrestrial Ecosystems'. Island Press; order from The Rewilding Institute.

South, G R, P A Skelton, J Veitayaki, A Resture, C Carpenter, C Pratt and A Lawendrau (2004) The Global International Waters Assessment for the Pacific Islands: aspects of transboundary, water shortage and coastal fisheries issues. *Ambio: a journal of the human environment* volume 33, issue 1, pp. 98–106.

SPREP (2005) Steve Menzies International Waters Project (IWP) Media Release, 7 July 2005. Available at: http://www.sprep.org/article/news_detail.asp?id=223 [last accessed October 2005].

United Nations (2002) Plan of Implementation of the World Summit on Sustainable Development. Department of Economic and Social Affairs, Division of Sustainable Development. Available at: http://www.un-documents.net/jburgpln.htm [accessed February 2011].

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Chapter 5

Sustainable Water Management in Pacific Island Countries: From Vision to Action

Global and Pacific SIDS water and sanitation challenges

Pacific island countries (PICs) are no different from other countries in that freshwater is essential to human existence and a major requirement in agricultural and other commercial production systems. The economic and social wellbeing of PICs are dependent upon the quality and quantity of their water. However, the ability of the island countries to effectively manage the water sector differs in small island developing states (SIDS), as they are constrained by their size, isolation, fragility, natural vulnerability, and a limited human, financial and natural resource base.

In acknowledgment of the particular constraints faced by SIDS, the Mauritius Strategy for the Further Implementation of the Barbados Programme of Action (BPOA+10) highlights the need to prioritise water and sanitation on the SIDS global and national agendas during the Water for Life Decade (UN, 2005).

The Mauritius Declaration of 2005, which reaffirmed support for the implementation of the BPOA+10 specifically, recognises that:

> *Small island developing states continue to face water management and water access challenges, caused in part by deficiencies in water availability, water catchment and storage, pollution of water resources, saline intrusion (which may be exacerbated, inter alia, by sea-level rise, the unsustainable management of water resources, and climate variability and climate change) and leakage in the delivery system. Sustained urban water supply and sanitation systems are constrained by a lack of human, institutional and financial resources. The access to safe drinking water, the provision of sanitation and the promotion of hygiene are the foundations of human dignity, public health and economic and social development and are among the priorities for small island developing states*.
>
> UN, 2005

Challenges faced by Pacific SIDS in promoting sustainable water management can be categorised into three broad thematic areas as identified by the Consultations for Small Island Developing Countries on Water Resources during the 3rd World Water Forum, held in 2002:

1. Small island countries have uniquely fragile water resources due to their size, lack of natural storage and competing land use, vulnerability to natural and anthropogenic hazards, including drought, cyclones and urban pollution. This requires detailed water resources monitoring and management and improving collaboration with meteorological forecasting services.
2. Water service providers face challenging constraints to sustaining water and wastewater provision due to the lack of resources including human and financial resource bases, which restrict the availability of experienced staff and investment, and effectiveness of cost-recovery.

Future action is required in human resources development, water demand management and improving cost-recovery.

3. Water governance is highly complex due to the specific socio-political and cultural structures relating to traditional community, tribal and interisland practices, rights and interests, which are all interwoven with colonial and 'modern' practices and instruments. These require programmes such as awareness, advocacy and political will, at community, institutional and government levels to create a framework for integrated water resources management.

Freshwater resources of small island states

Freshwater resources in small island states consists of both 'conventional' and 'non-conventional' resources (Burns, 2003). Conventional resources include rainwater collected from natural or artificial surfaces, groundwater and surface water. Nonconventional resources include desalination, imported water and treated wastewater. For many islands, rainwater tends to be used as a supplementary source for cooking and drinking (Falkland, 1999). The majority of Pacific islands rely on groundwater for at least some of their water needs. Groundwater mainly occurs in perched and basal aquifers in small island states. Perched aquifers occur where an impermeable layer exists in the zone of aeration, which creates a groundwater formation above the water table, or when groundwater is retained in compartments in vertical volcanic dikes (Falkland and Custodio, 1991). Basal aquifers occur where rainwater percolates through an island and floats on the denser salt or brackish water in what is termed as a Ghyben-Herzberg lens. These lenses may be as thick as 20 metres on some islands, and as thin as 10–20 centimetres on raised coral atolls such as Tonga and Nauru (Burns, 2003). Surface water is found mainly on high islands of the Pacific, which tend to be the predominant source of freshwater because gravity-fed water systems are often more cost effective than groundwater pumping systems. Nonconventional water resources are not commonly used in the Pacific due to the high cost of supply. Only Nauru has relied heavily on desalination to meet water requirements.

Access to safe water and adequate sanitation

Access to safe drinking water, which is vital for human health and development, ranges from 23 per cent in Papua New Guinea (PNG) to 100 per cent in countries such as Tuvalu, Tonga, Niue and Tokelau (Pacific Islands Forum Secretariat [PIFS] and the Pacific Islands Applied Geoscience Commission [SOPAC], 2005). However, rapid population growth, increasing urbanisation, damage to water catchments resulting from deforestation, poor waste management practices leading to water pollution, and climate change are expected to further exacerbate the challenge of providing access to safe water.

Data on the region's access to safe drinking water and basic sanitation, illustrated in figures 5.1 and 5.2 respectively, is provided by SPC (2004) in the Pacific Islands MDG Report, under Millennium Development Goal 7: Ensuring Environmental Sustainability. The figures demonstrate that there is need for much improvement in the region.[1] According to the MDG report, atolls and other small islands that are reliant on rainwater collection or groundwater in basal aquifers face especially difficult challenges in ensuring that the population has access to safe drinking water supplies. In addition, climatic variability, which has been increasing over the past two decades and which could be linked to climate change, is posing a serious challenge to safe drinking water supplies in the region. For example, in 1998, droughts in Marshall Islands, Nauru, PNG, Fiji, Tonga and Samoa resulted in some of the worst water shortages on record in the region (SPC, 2004).

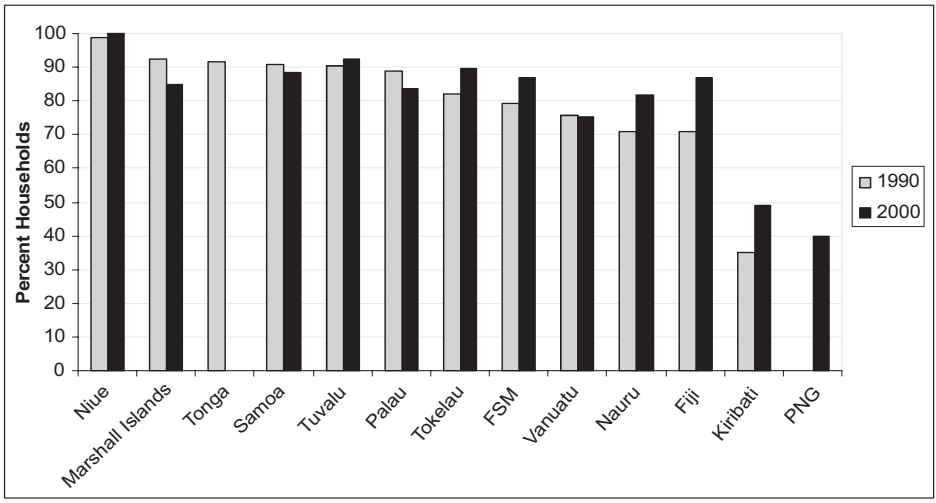

Figure 5.1 Proportion of urban and rural households with sustainable access to an improved water source
Note: Measures proportion of households rather than proportion of population. Figures may differ from rates calculated previously because of the definitions of 'improved' and 'not improved'.

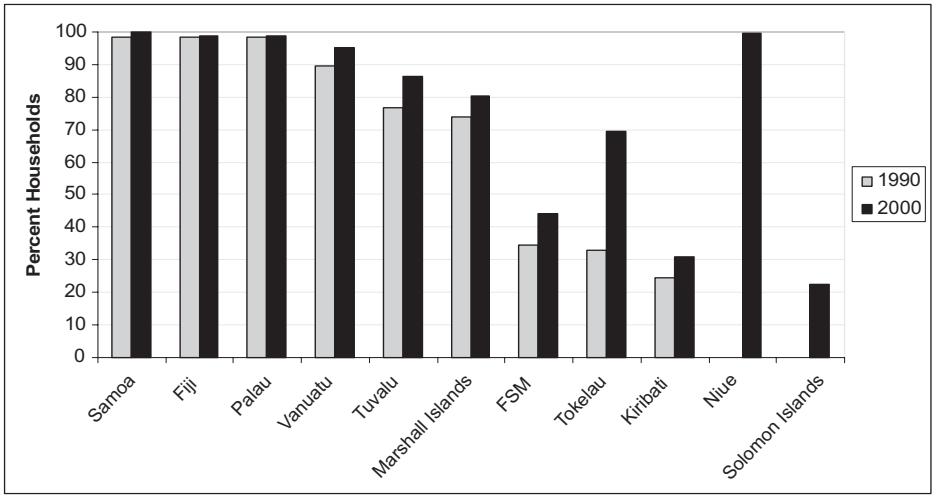

Figure 5.2 Proportion of urban and rural households with access to improved sanitation
Note: Measures proportion of households rather than proportion of population. The inadequacy of information regarding suitability of wastewater disposal methods and of facility location, construction and maintenance means these data should be used with caution when assessing access to 'improved' sanitation. Figures may differ from rates calculated previously because of the definitions of 'improved' and 'not improved'.

Other regional assessments have produced similar graphs using data from a performance benchmarking exercise in 2001 for Pacific Water Utilities (Asian Development Bank [ADB], 2005) but the data shown is equally unreliable to allow for a regional comparison and gauging progress in MDG targets. The final report[2] states: 'Interpretation of benchmark results for the water/wastewater sector in the Pacific is constrained by (i) a lack of a regional standard for measuring costs and valuing assets and, more importantly (ii) a general lack of consensus among utility managers, government authorities, and donors regarding performance targets that are realistically achievable within a given time frame'.

Further benchmarking by public water utilities and improved census data in PICs required with the inclusion of clear MDG target definitions on access to safe drinking water and adequate sanitation.

Impacts on human health

More recent health statistics (WHO, 2005a) show the relatively high infant mortality rates caused by diarrhoeal diseases in figure 5.3 and, as stated by the Pacific MDG Report (SPC, 2004), 'the issue of impacts to human health due to contamination of water supplies and inadequate sanitation has been recognised for many years'. According to McKean and Baisyet (1994) 'the pollution of drinking water and the resulting health hazard may be one of the biggest watershed issues in island countries of the South Pacific' (quoted in SPC, 2004, p. 110).

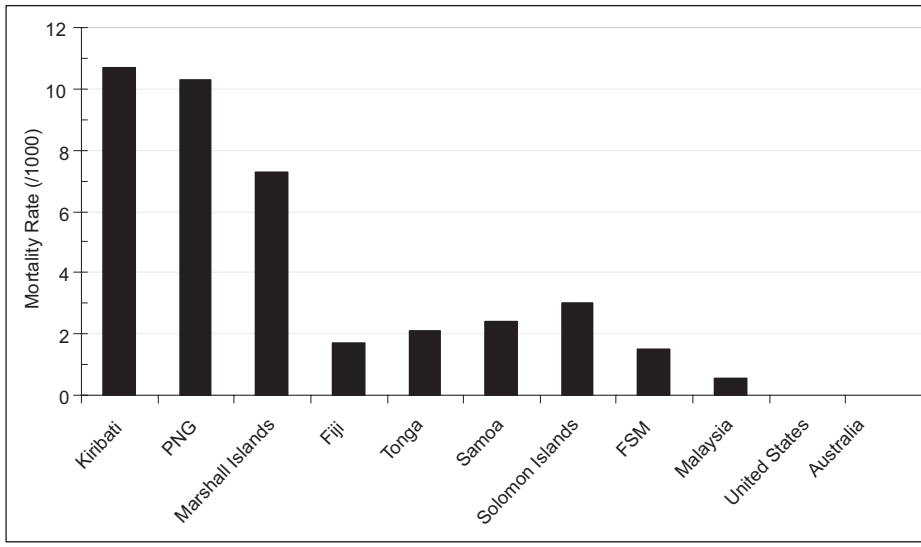

Figure 5.3 Infant mortality rate caused by diarrhoeal diseases (/1000)
Source: CHIPS WHO, 2005a[3]

High incidence of diarrhoeal and other infectious diseases (e.g. hepatitis, typhoid and cholera) on some small islands is often caused by poor quality groundwater used as a source of drinking water. Outbreaks of cholera in PICs have been linked to contaminated water – for example in Kiribati (e.g. Tarawa in 1977) and FSM (e.g. Chuuk in 1982–83 and Pohnpei in 2000); and Marshall Islands (2001). The incidence of diarrhoeal diseases in PICs has been found to vary with water availability and climate, with high disease incidence associated with low water availability, and higher temperatures. Pollution of water supplies from sanitation systems is a priority issue as it can have severe health impacts on individuals and populations. Small islands with high population densities (e.g. main population centres on atolls) are particularly affected. Significant reduction in microbiological pollution of groundwater or surface water resources requires installation of appropriate, affordable sanitation systems in small island communities.

Pollution problems are generally greater in urban and peri-urban areas with high population densities where the sanitation systems are principally pit toilets (either latrine or pour flush) and septic tanks, but many smaller villages also either exhibit high bacterial levels in groundwater or have the potential for such pollution. The problem is endemic in many small low-lying coral islands of the Pacific and other regions, which are characterised by thin and highly permeable soil zones, and is a major constraint to improvements in water quality (Falkland, 2002).

For example, the costs associated with reduced lagoon and drinking water quality resulting from herbicide, pesticide and fertiliser run-off, livestock and animal waste, septic tank leakage and inappropriate liquid and solid waste disposal in Cook Islands has been estimated to impose annual costs of NZ$7.4 million on the economy (or NZ$2,900 per household). A significant portion of these costs are attributable to public health spending on treating waterborne diseases and preventative expenditures on bottled water to avoid becoming sick from drinking contaminated groundwater supplies (Hajkowicz and Okotai, 2005).

Given the impacts of wastewater practices on water quality and human health, any improvement in water services provision has to be linked to sanitation, hygiene and programmes that aim for behaviour change. This is still rarely practised in the Pacific region where assistance is provided through mainly sectoral approaches.

The need to mainstream water resources management into national development strategies and priorities

The failure to recognise that economic and social development in PICs is inextricably linked to the sustainable management of water resources has resulted in the lack of focus or priority given to water and sanitation issues in national development strategies. As a result inadequate budgetary resources are allocated to this sector, which can jeopardise progress made by PICs in meeting the MDG targets to reduce by half the people without access to safe drinking water and basic sanitation before 2015.[4] In addition, it also hampers progress on the MDG target that aims to produce integrated water resources management (IWRM) and water use efficiency (WUE) plans.[5] IWRM can be used not only to achieve MDG targets but also to promote long-term economic development, poverty reduction and environmental sustainability as discussed in box 5.1 below.

Box 5.1 How integrated water resources management contributes towards the achievement of the Millennium Development Goals

IWRM provides a framework within which to consider trade-offs between different development objectives and, where possible, to identify win-win water investments. By aligning and integrating interests and activities that are traditionally seen as unrelated or that, despite obvious interrelationships, are simply not co-ordinated, IWRM can foster more efficient and sustainable use of water resources to achieve the MDGs. It must be emphasised, however, that an IWRM approach will support not just achievement of the MDGs, but also the long-term economic development, poverty reduction and environmental sustainability that will be needed to sustain that achievement.

The MDG process provides an opportunity to re-examine and modify the current development paradigm such that national development and poverty reduction strategies consider more explicitly (1) the multifaceted role that water resources management plays in poverty alleviation, environmental protection and economic development; and (2) the trade-offs between, and potential synergies among, a multitude of objectives (e.g. equity, economic efficiency and environmental protection). IWRM is not simply a process designed to carry us to a set of 2015 targets, but a way of thinking that enhances our capacity to tackle multi-objective, multisectoral development planning – such as is embodied by the MDG process.

Source: Global Water Partnership (2005)

To some degree PICs have used the UN Commission on Sustainable Development meetings in 2004 (CSD12) and 2005 (CSD13) to facilitate prioritisation of water in their national sustainable development strategies (NSDS), but the real efforts towards achieving the MDG targets remain largely driven by outside entities.

Despite this, communities at large express a great desire to increase their access to water and sanitation, shown through various in-country consultations. For example, extensive community consultations carried out in Kiribati for the National Adaptation Program of Action (KAP Phase I) identified several priority adaptation strategies where seven out of the top ten priorities were water and sanitation-related (Global Environment Facility [GEF], 2004).

Under development assistance provided by the European Union under the National 'B' Envelope in the Pacific, aimed at building and strengthening national actions to reduce vulnerability to natural disasters and build resilience, four out of eight participating countries selected water security for their area for intervention (SOPAC, 2007).

Other vulnerability and adaptation assessments and studies conducted by PICs as part of their preparation of national adaptation programmes of action (NAPA) have highlighted climate impacts on water resources and the need for adaptation, with subsequently four out of eleven participating countries giving priority to water interventions under the GEF-funded Pacific Adaptation to Climate Change (PACC) programme (SPREP, 2007).

Despite water and sanitation being identified as a priority for PICs within quite a number of regional support programmes as demonstrated above, the human as well as the financial capacity to address the root causes of unsustainable management of water resources and more specifically, the lack of access to water supply and sanitation services, remain largely inadequate. This requires the capacity of PICs to be significantly enhanced. Capacity building is something usually not incorporated in bilateral assistance programmes, and remains largely dependent on regional support mechanisms which only have limited effects when put in place in isolation.

Introducing integrated approaches

In addition to the MDG water and sanitation targets, the global community also adopted a lesser-known target in Johannesburg (WSSD, 2002) 'to develop integrated water resources management and water efficiency plans (IWRM/WUE plans) by 2005 **with support to developing countries to** achieve broader societal goals such as poverty reduction, health improvements and environmental sustainability'.

IWRM is a relatively new 'brand' in the Pacific islands and several surveys undertaken for the Global Water Partnership (GWP) and the Japan Water Forum have shown that little progress has been made in the Pacific region on this specific target, with only a few countries having started catchment IWRM plans or drafting national IWRM plans. However, the concept and the approaches IWRM embodies – namely, the need to take a holistic approach to ensure the socio-cultural, technical, economic and environmental factors are taken into account in the development and management of water resources – has been practised at a traditional level for centuries in the Pacific islands.

The formal development of the IWRM management approach within governance structures at the national level has not been a widespread reality. At the national level, often there exists multiple agencies that deal with water, and this fragmented management of water resources is exacerbated by the lack of overarching policy, outdated laws and poor administration capacity for integration (PIFS and SOPAC, 2005). This has largely been a function of inherited colonial government structures with their inherent line ministries and poor inter-ministerial liaison and collaboration, with a general tendency for government administrations to be inadequately resourced and weak compared to local and traditional governance structures (Carpenter and Jones, 2004). As a persistent constraint for integration, water has been regarded as everybody's business and therefore no individual's responsibility.

IWRM island style

Growing recognition since the late 1990s and into the new millennium that sustainable water resources management was not being achieved in the PICs started to focus water stakeholders on identifying the causes. It was increasingly understood that competing activities in watersheds and on small atoll islands had to be tackled together if the water resources of the catchments and on the islands were to be managed adequately.

Cyclone and drought events, to which the PICs are especially vulnerable (due to the small size of the catchments and aquifers and therefore the lack of natural storage) affect all water users, whether they be urban or rural water supplies, commercial forestry and agriculture, subsistence agriculture, and of course the fisheries/reefs and tourist developments. The need for drought and disaster preparedness plans became two forms of climatic extreme water resources management, recognised as national priorities in many PICs.

Additional mounting evidence was suggesting that pollution on land from inadequate wastewater disposal, increased sediment erosion and industrial discharges, were impacting upon coastal water quality and fisheries stock which sustain the entire island populations. In the islands, this led to looking at managing water resources not only within the watershed but also the receiving coastal waters.

'Doing things right' vs 'doing the right things'

In order for IWRM to work, effective institutional development is required. As mentioned in a speech on this topic delivered by the Dutch Minister for Development Co-operation at the World Bank (Herfkens, 2001) the notion was made that the focus of development assistance has usually been on **doing things right** whereas the focus should actually be on **doing the right things**. The speech paraphrased the differences as follows:

- **Doing things right**. That means losing sight of the big picture in which you operate. Concentrating on your own job and your own responsibility to carry it out to the best of your ability. And it means fear of change, of taking risks and making mistakes. Procedures take priority over goals.
- **Doing the right things**. This means starting with a clear vision of the context in which you work. Being flexible so that you can adapt to new situations. Knowing where you are heading and how to get there.

As for the Pacific region, there are numerous examples of losing sight of the big picture, e.g. the concentration on the potential impacts of climate change on small island communities has deflected attention and resources away from the immediate and serious day-to-day problems faced by small island nations, particularly in water resources (White et al., 2007). The above obviously does not preclude the application of coping strategies and adaptation measures to climate variability and change, which on the contrary, is essential for water resources management in PICs.

During the five years preceding the Water for Life Decade major progress has been made towards identifying the right things and how these can be undertaken for the water sector, most notably through the Pacific Regional Action Plan on Sustainable Water Management which followed the consultations held for the Water in Small Island Countries Session at the 3rd World Water Forum.

Box 5.2 'Doing things right': the case of liquid waste management in Tuvalu

The Government of Tuvalu has considered a number of alternative sanitation systems over the past 15 years to address the groundwater and lagoon pollution problem in the country's capital, Funafuti, caused by leaking septic tanks and soak pits, these include: a centralised reticulated system, mini-treatment plants, repairing the existing septic tanks with plastic ones, a hybrid system which uses reduced quantities of water and the use of compost toilets.

A large-scale reticulation system was recommended by ADB (1996) based on environmental grounds. This would involve establishing a network of pipes for a seawater-based second-class system, a sewerage disposal system together with a centralised treatment plant. The total cost of this system was estimated to be 11.7 million Australian dollars (A$), with monthly maintenance costs of A$11,000. The benefits of constructing a reticulated system would be low in comparison to costs since the annual household cost of poor waste management practices (health treatment costs, bottled water costs, costs of installing rainwater tanks, etc…) was estimated to be A$500,000 (or $700 per household) per year.

On the other hand, the annualised cost of purchasing and installing compost toilets in homes was estimated to be A$700 for new homes, and A$900 for existing homes, which is comparable to the costs that households are currently incurring as a result of poor waste management practices on Funafuti (not to mention the added value of selling compost and water savings associated with compost toilets). It is estimated that if all residents were to convert to compost toilets, Tuvalu could expect to save A$2 million annually.

Source: Lal, Saloa and Uili (2006)

Strategic development: towards sustainable water resource management in the Pacific

There are four main strategic documents that now drive regional water and sanitation development in the Pacific:

1. The **Pacific Wastewater Policy** and associated Pacific Wastewater Framework for Action, were both completed in 2001 in Majuro and developed as part of UNEP's Global Programme of Action for the Marine Protection from Land-Based Sources of Pollution (GPA) (Bower et al., 2002).
2. The more holistic **Pacific Regional Action Plan on Sustainable Water Management** (Pacific RAP) was completed in 2002 in Sigatoka and was produced by the region in preparation for the Water in Small Island Countries session at the 3rd World Water Forum in Kyoto, 2003. Inclusive of wastewater and sanitation, the action plan provides a holistic approach to achieving sustainable water management using a framework of six thematic areas. Each theme has key messages or sub-themes, and each of these has a list of actions. Priority actions under each theme are listed in figure 5.4 below (ADB and SOPAC, 2002).

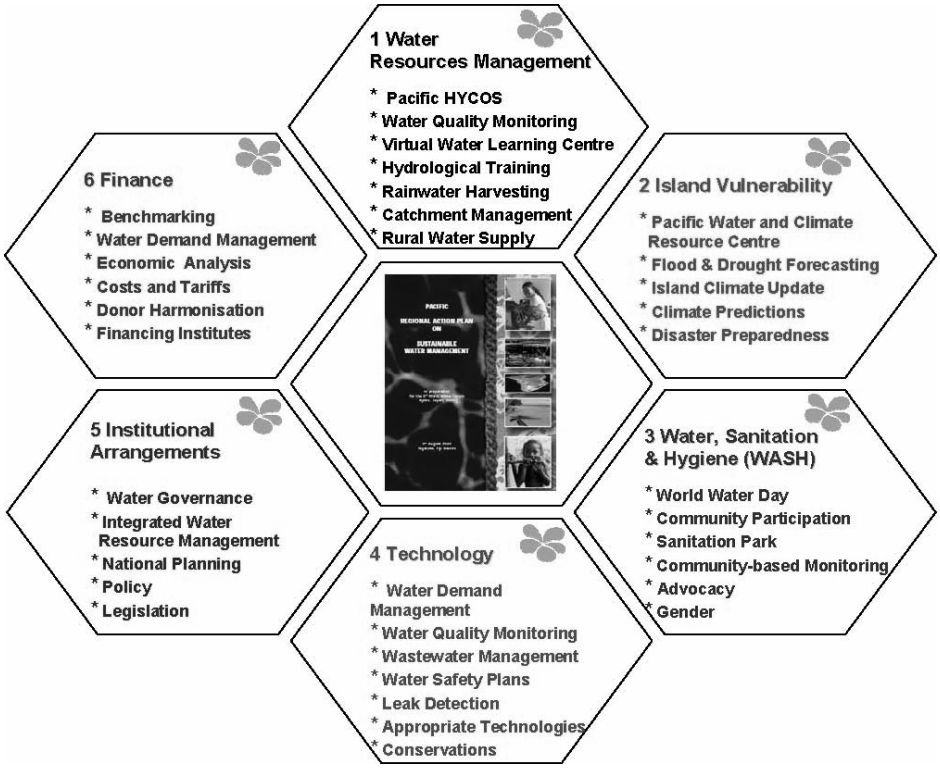

Figure 5.4 Diagram of Pacific Regional Action Plan on Sustainable Water Management

The Pacific RAP was endorsed at ministerial level in August 2002 and at head of state level in August 2003. This level of political commitment was largely secured through the transparent and participatory consultation process leading up to the development of the Pacific RAP. Importantly, the inclusion of the regional donors and development agencies in the consultations has also given them ownership of the Pacific RAP.

3. A WHO-facilitated workshop on Water Quality Standards and Monitoring in Pacific Island Countries held in Nadi, Fiji in 2005 resulted in a **Water Quality and Health Framework for Action** which was developed as a complementary framework building on the Pacific RAP (WHO, 2005b).
4. In addition the UNESCO-facilitated workshop (Nelson, 2005) on Hydrology for Environment, Life and Policy (HELP) resulted in a **Framework for Action for HELP in the context of the Pacific Regional Action Plan** (Waterman et al., 2007).

Following the above strategic developments, Pacific Heads of State recommended at their Advisory Committee on the Protection of the Sea (ACOPS) summit meeting, held in Nadi, Fiji in 2006, that water, sanitation and hygiene challenges facing the region be directly addressed under the **Pacific Plan** through the Pacific Regional Action Plan on Sustainable Water Management, providing further political endorsement to this strategy and its sister frameworks for action (SOPAC, 2004).

Water demand management

In the past, development projects in the water sector have mainly focused on the upgrading or extension of existing water supply infrastructure. Not only has this supply-driven approach been very costly for donors and receiving countries, but it has also failed to ensure delivery of safe water supplies, even for larger urban centres in most PICs (Schölzel and Bower, 1999). With pressure on limited water resources, many countries in the region have realised that the key to sustainability lies in more sound management of the existing water system rather than costly infrastructure extension. Since water supply systems are subject to economies of scale, systems in the region that serve small populations have high unit costs. This clearly suggests the need for an emphasis on cost recovery and improved operational efficiency in water and sewerage.

Demand management involves a number of measures including cost-reflective pricing and universal metering, reticulation leakage detection and repair programs, community education and awareness campaigns, and regulation of the efficiency of water-using appliances, which is intended to reduce water wastage in the system, thereby relieving pressure on freshwater supplies and protecting water quality.

Water pricing can be used to both raise water utility revenues and improve the efficiency of water use. In formulating water pricing policy, capital and recurrent costs of treatment and distribution, current level of government subsidy, the level of external funding, types of water consumers, level of demand and willingness and ability to pay for water must be considered (United Nations Environment Programme [UNEP], 1998). There are a number of examples in the Pacific where effective water pricing combined with the installation of water meters has resulted in a significant improvement in efficient water use. For example, a 43 per cent decline in water consumption in Honiara was attributed to the installation of water meters. In Samoa, introduction of meters by the Samoa Water Authority reduced consumer demand from approximately 900 to 300 litres per person per day. Prior to the installation of meters customers were supplied with a mixture of treated and untreated water and were not prepared to pay for the inconsistent quality of water supplied. Reducing the demand has allowed the majority of customers to be served with treated water and

increased the revenue stream for the utility contributing towards its sustainability. In Majuro, in Marshall Islands, tariff increases have resulted in more responsible water use by consumers. As a result, rainwater catchments are now the preferred source of water, especially among low-income households (World Bank, 2004).

Using partnerships to promote sustainable management of water resources

The Pacific RAP consultations also provided the platform to develop the **Pacific Partnership Initiative on Sustainable Water Management** (submitted to World Summit on Sustainable Development [WSSD] which aims to facilitate the implementation of all listed actions in the Pacific RAP on a national, regional and international level (Overmars, 2002).

The partnership has facilitators (SOPAC and USP) who are responsible for implementing the core functions of the partnership: liaising between the regional stakeholder groups and their sub-networks; researching and receiving stakeholder information on on-going and planned water activities; tracking donor and development agency programmes; identifying areas requiring implementation; and co-ordinating proposal submissions and project implementation. The facilitator is also responsible for high-level advocacy of the strategic approach.

The partnership enables countries and development agencies to: identify successful previous activities and therefore improve the sustainability of subsequent interventions; reduce and prevent duplication of activities; link country requirements to development programmes (and vice versa); and augment existing and proposed activities nationally and regionally.

This co-ordinated approach has already proved successful in implementing projects or providing technical assistance to PICs and many of the partnership activities have also resulted in increased donor collaboration and harmonisation on in-country action plans and strategies. This has been demonstrated, for instance, through the regional response to use the Kiribati National Water and Sanitation strategy developed with the support of the ADB in collaboration with SOPAC as a framework to address water-related issues under a GEF climate adaptation programme which is being implemented by the World Bank with financial contributions from AusAID, NZAID and the EU.

The level of intervention by the partnership through regional support programmes is largely restricted to capacity building, advocacy and awareness targeted at the key counterpart government departments in PICs. However, the success of the Pacific RAP, and its sister action plans on waste water and drinking water quality and health, is ultimately determined by the success of its implementation at national and local levels, which are significantly more difficult to implement and monitor.

Monitoring and evaluation of Pacific RAP implementation are carried out using a matrix inventory of previous, existing, planned and proposed activities, including details of the stakeholders involved, the intervention objectives, implementation duration and status, and anticipated impact.

The Pacific RAP and associated partnership allows supporting organisations to optimise their role in building the region's capacity and assist in implementing the Pacific RAP through a co-ordinated approach while lining their services up with the requirements and needs expressed by PICs.

Introducing water safety planning to improve drinking water quality and health

An example of enhanced partner co-ordination and donor harmonisation is provided through a series of interventions that focus on the improvement of drinking water quality and health.

Following the Pacific Framework for Action on Drinking Water Quality and Health, support has been forthcoming through the Pacific Water Safety Plans Programme (WSP) implemented through SOPAC and WHO and supported by AusAID for the period 2005–2007 (SOPAC/WHO, 2006).

Water safety plans are defined in the third edition of the WHO Guidelines for Drinking Water Quality (WHO, 2004) as 'a comprehensive risk assessment and risk management approach that encompasses all steps in the water supply from "catchment to consumer" to consistently ensure the safety of water supplies'.

As mentioned earlier, growing segments of the population in the Pacific are at risk to water borne diseases (through polluted drinking water, from coastal as well as surface sources). This is compounded by a lack of information needed for water resource development and protection as well as a lack of awareness of the problems associated with contaminated water. The introduction of the water safety plan concept in PICs will address all aspects of drinking water supply through an integrated approach with a focus on the control of abstraction, treatment and delivery of drinking water in combination with attention for awareness and behaviour change. The Pacific region now stands to benefit from pilot WSP projects in four countries. Strong interest from governments, water utilities, NGOs and partner agencies has evolved through the programme in these pilots with replication already being undertaken in interested countries and a replication strategy being developed for other PICs.

Two companion projects supported by NZAID/NZODA have now followed this lead under the Framework for Action. The SOPAC/WHO/IAS Water Quality Monitoring Capacity Building Programme for Pacific Island Countries (WQM) provides monitoring and laboratory support components which complement the AusAID-funded WSP. Secondly, in-kind support is provided by the New Zealand Ministry of Health with their water safety and water quality experts being fielded to PICs, guided by the SOPAC/WHO team to technically support the national WSP and WQM pilot projects.

Figure 5.5, below, illustrates the integrated plan on drinking water quality and health implemented through various regional support mechanisms.

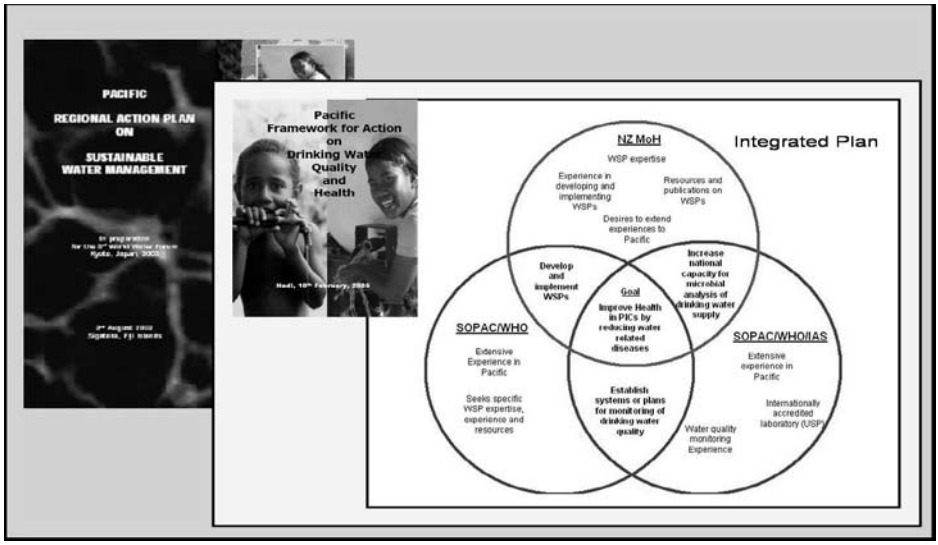

Figure 5.5 Integrated plan on drinking water quality and health
Source: ADB and SOPAC, 2002

The integrated plan highlights areas (activities and outputs) where the three programmes are integrated to maximise coverage, delivery, impact and success by fully utilising existing synergies. The objectives under each programme, although distinct, have a shared and common goal of reducing water-related diseases in the Pacific region. As a result the activities and outputs of each programme complement the others.

Beyond the co-ordination of WHO, SOPAC and USP-IAS work as regional partners each providing support in their area of expertise, so that donor support is channelled to countries in a co-ordinated fashion. This can be even further enhanced through the interest donor agencies may have in providing financial support towards the improvement schedules that are resulting from the WSP pilots and which require at times large infrastructural interventions.

Introducing IWRM and WUE planning

The Pacific RAP in general provides a unique model to improve the assessment and monitoring of water resources, reduce water pollution, improve access to technologies, strengthen institutional arrangements, and lever additional financial resources in support of IWRM on a regional scale.

The partnership provided a platform for the development of proposals to the GEF and the European Union ACP-EU Water Facility (ACP-EU WF) in a unique arrangement for mutual aid and assistance, for a programme on sustainable integrated water resources management in PICs in association with UNDP and UNEP. The resulting collaboration between the two facilities (GEF and EU WF) provides an unprecedented opportunity to allow the harmonisation of two global funding mechanisms.

The long-term objective of the planned integrated water resources management (IWRM) interventions is to assist the PICs with the implementation of applicable and effective IWRM and water use efficiency (WUE) plans. The GEF-funded component will see the implementation of catchment

(or island) demonstration projects whereas the EU WF-funded component will focus on the development of national IWRM plans and improvements in institutional arrangements over the next few years and within the Water for Life Decade.

The pivotal role all members of the Pacific Partnership Initiative on Sustainable Water Management are playing in the design and implementation of these IWRM interventions under the above programmes including CROP and UN organisations, funding agencies, NGO's, CBO's, universities and research institutes, can be used as a model for increased donor harmonisation and co-ordination of water and sanitation interventions.

Monitoring of investments and results

In PICs there is an urgent need to strengthen monitoring mechanisms to understand where investments are being made, where investment gaps occur, and what the impact is of different interventions and investments. This information is invaluable for national sustainable development planning and sectoral strategic planning and to determine best practices which need to be replicated. Donors monitor for reporting to their national governments/investors, and to improve their programming, but how can monitoring across donors and sectors be harmonised?

Partnerships and networks have a critical role to play in monitoring and recording investment data and understanding the impact of those investments. Capacity building and mainstreaming can often produce intangible benefits. Greater impact may be created by seconding and implanting staff from developed countries and international organisations into Pacific island governments to improve capacity through mentoring.

Monitoring the impact of water investments can be linked to wider development outcomes, such as health and economic growth indicators. However, it is often difficult to assign attribution due to the lack of control over exogenous variables, lack of data, and lack of statistical rigour. However, the direct outputs of physical infrastructure, services, quality and resource mobilisation are clearly measurable and this is not receiving enough attention.

Economic analysis, including benefit-cost analysis, can provide a useful framework for determining the pay-off from proposed investments in the water and sanitation sector. Given the scarce resources available for investing in improved water management in PICs, benefit cost analysis can be used to determine which investments are most efficient, i.e. provide the best value for money, by comparing the benefits of a particular project or activity with its costs. For example, benefit-cost analysis was used in Tuvalu, under the International Waters Project, to determine the most cost-effective option for addressing liquid waste management in Funafuti (Lal, Saloa and Uili, 2006).

Within SIDS, due to the complex multi-donor environment, multiple cross-sectoral impacts (due to the small size and complicated hydrogeological nature of the islands) it becomes difficult to establish all the causal links and specific monitoring and evaluation rules need to be determined. Little information exists on private sector involvement (including the value of community engagement, time, and contributions to projects and programmes). It is difficult to determine baseline activities, i.e. those activities solely for the benefit of a particular sector, due to the volume of different donor initiatives. Government funding tends to dominate sectoral funding but private sector funding is often not recorded or included, or is discounted.

SOPAC uses the Pacific Water Action Matrix under the Pacific Partnership Initiative on Sustainable Water Management. By collating information on projects and programmes in the Pacific, knowledge is improving on investments made. This data-focused approach takes considerable time

but by starting the process it provides a valuable benchmark for the future. Completed project information is being sourced now but it is difficult to locate.

This approach needs to be aligned with a monitoring and evaluation (M&E) framework, which the GEF-funded IWRM programme will develop so that the impact of investments past and present can be understood to improve planning for the future. The Pacific already has the Regional Action Plan on Sustainable Water Management as a guiding structure for monitoring investments and the impact of those investments.

Conclusions

If the MDG targets on water and sanitation are to be achieved (reduce by half the number of people without access to safe drinking water and basic sanitation before 2015), additional resources have to be made available to the water sector in the Pacific. The third 'water-related' MDG target of developing national IWRM plans by 2005 has been modified into 'setting processes in motion' towards National IWRM Plans.

With the regional support programmes being well established and funded, there is now an increased need to focus on implementation at the national and local levels through a two-pronged approach: i) further improvements in national strategy, planning and institutional arrangements (partly through the development of national IWRM/WEU plans) and ii) increased focus on water and sanitation improvements in the NSDS. Prioritisation of water and sanitation in the national political agendas as well as harmonisation of donor agency programmes are in this respect key to maximise the impact of actions and would need to be supported by a regional framework for monitoring of investments and results.

References

Asian Development Bank (ADB), report prepared by Townland Consultants Limited in association with Barrett Consulting Group and EDU International (1996) Tuvalu urban planning and environment management study, final report. Manila: ADB.

ADB and Pacific Islands Applied Geoscience Commission (SOPAC) (2002) Pacific Regional Action Plan on Sustainable Water Management. Suva, Fiji.

ADB (2005) Development Effectiveness Review, 2009 Report. Available online at: http://www.adb.org/Documents/Reports/Development-Effectiveness-Review/2009-Development-Effectiveness.pdf [last accessed June 2010].

Bower, B, C Carpenter and M Overmars (2002) Pacific Regional Wastewater Policy Statement and Framework for Action. In *Regional Meeting of Stakeholders in Wastewater Management, 10–15 October 2001, Majuro, Marshall Islands*. Suva, Fiji: SOPAC Miscellaneous Report 451.

Burns, W C G (2003) 'Pacific Island developing country water resources and climate change'. In P H Gleick, W C G Burns, E L Chalecki, M Cohen, K K Gushing, A S Mann, R Reyes, G H Wolff and A K Wong, *The World's Water 2002–2003: The biennial report on freshwater resources*. Washington, DC: Island Press, pp. 113–131.

Carpenter, C, J Stubbs and M Overmars (eds.) (2003) *Proceedings of the Pacific Regional Consultation on Water in Small Island Countries, Sigatoka, Fiji Islands, 29 July – 3 August 2002*. Suva, Fiji: ADB and SOPAC.

Carpenter, C, and P Jones (2004) An Overview of Integrated Water Resources Management in Pacific Island Countries: a national and regional assessment. SOPAC Miscellaneous Report 554.

Falkland, A and E Custodio (1991) Hydrology and water resources of small islands: A practical guide. UNESCO contribution to the International Hydrological Programme.

Falkland, A (1999) Impacts of climate change on water resources of Pacific islands. PACCLIM Workshop, Modelling the Effects of Climate Change and Sea Level Rise in Pacific Island Countries. Auckland, New Zealand, p. 2.

Falkland, A (2002) Theme 1: water resource management. In C Carpenter, J Stubbs and M Overmars (eds.) *Proceedings of the Pacific Regional Consultation on Water in Small Island Countries, Sigatoka, Fiji Islands, 29 July–3 August 2002*. Suva, Fiji: ADB and SOPAC.

GEF (2005), Kiribati Adaptation Programme (KAP). WB/GEF, Washington, USA.

GWP (2005) Policy Brief 4: Catalyzing Change: a handbook for developing integrated water resources management (IWRM) and water efficiency strategies. Stockholm, Sweden: GWP.

Hajkowicz, S, and P Okotai (2005) *An Economic Valuation of Watershed Pollution in Rarotonga, Cook Islands*. Cook Islands, Rarotonga: International Waters Project.

Herfkens, E (2001) The future of technical assistance and capacity building. Remarks by Minister for Development Cooperation of the Netherlands, WBI breakfast, Washington DC, USA.

Lal, P, K Saloa and F Uili (2006) *Economics of Liquid Waste Management in Funafuti, Tuvalu*. Tuvalu: PIFS, SPREP and IWP.

McKean and Baisyet, P (1994) Watershed Management on Islands of the South Pacific, Tonga, Cook Islands, Pohnpei (Federated States of Micronesia) and Palau. South Pacific Forestry Development Program.

Overmars, M (2002) *Pacific Type II Partnership on Sustainable Water Management*. Suva, Fiji: SOPAC.

Pacific Adaptation to Climate Change (PACC) (2007) GEF FSP Pacific Adaptation to Climate Change. Apia, Samoa: SPREP.

Pacific Islands Forum Secretariat (PIFS) and SOPAC (2005) Pacific Co-operation Plan; preliminary sector analysis for water, sanitation and hygiene. Suva, Fiji: SOPAC.

Schölzel, H and R Bower (1999) Miscellaneous Report 345. Water Demand Management Workshop, Nadi, Fiji, June 1999 (SOPAC).

South Pacific Commission (SPC) (2004) Millennium Development Goals Report. Noumea, New Caledonia.

South Pacific Islands Applied Geoscience Commission (SOPAC)/WHO (2006) Water Safety Plan Programme: disaster risk reduction under EU Pacific EDF9 B – Envelope. Suva Fiji: SOPAC.

SOPAC (2007) Reducing Vulnerability of Pacific ACP States. EU EDF 8/EDF9 – SOPAC/EU Project Report 93. Project Progress Report, Intermediate Report for the period January to June 2007.

South Pacific Regional Environment Programme (SPREP) (2002). Pacific Islands Regional MDG Report: Goal 7 – Ensure Environmental Sustainability. Available online at: http://www.sprep.org/att/IRC/eCOPIES/Pacific_Region/50.pdf [last accessed August 2010].

SPREP (2007) Climate Change, Variability and Sea Level Changes. Available online at: http://www.sprep.org/topic/climate.htm [last accessed August 2010].

United Nations (2005) Report of the International Meeting to Review the Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States, Port Louis, Mauritius, 10–14 January 2005.

UN Environment Programme (UNEP) (1998) UNEP Annual Report 1998. Asia and the Pacific, Bangkok, Thailand 1999.

Waterman, E et al. (2007) HELP in the context of the Pacific Regional Action Plan on Sustainable Water Management: a framework for action. Apia, Samoa: UNESCO.

White, I, et al. (2007) Society-Water Cycle Interactions in the Central Pacific: impediments to meeting the UN millennium goals for freshwater and sanitation. In RIHN 1st International Symposium *Water and Better Human Life in the Future*, Kyoto 6–8 November 2006, paper.

World Bank (2004) Pacific Infrastructure Review. Background Paper, Final Report. Available at: http://siteresources.worldbank.org/INTEAPINFRASTRUCT/Resources/855084-1137106254308/PacificIslandsStudy.pdf [last accessed June 2010].

World Health Organization (WHO) (2004) *Guidelines for Drinking Water Quality* (3nd ed.) Geneva, Switzerland: WHO.

WHO (2005a) Country Health Information Profiles (CHIPS) Geneva, Switzerland: WHO.

WHO (2005b) *Framework for Action on Drinking Water Quality and Health in Pacific Island Countries*. Suva, Fiji: WHO.

Notes

1. Indicator 30, the Proportion of Households with Access to Safe Drinking Water, monitors access to improved water sources based on the assumption that improved sources are likely to provide safe water; 'unsafe' water is the direct cause of many diseases in developing countries. Access to safe water refers to the percentage of the population with reasonable access to an adequate supply of safe water in their dwelling or within a convenient distance of their dwelling. The Global Water Supply and Assessment Report 2000 defines 'reasonable access' as 'the availability of 20 litres per capita per day at a distance no longer than 1,000 metres'.

   However, access and volume of drinking water are difficult to measure and so sources of drinking water that are thought to provide a safe and reliable supply of water are used as a proxy. Likewise, the definition of access to improved sanitation facilities and the methods for assessing it are even more contentious than those for water with national definitions of 'acceptable' sanitation varying widely (SPC, 2004).
2. TA: REG 38633: *Technical Assistance for Improving Delivery of Infrastructure Services*, approved in 2005.
3. Infant mortality rates measure child survival. They also reflect the social, economic and environmental conditions in which children (and others in society) live, including their health care. Because data on the incidences and prevalence of diseases (morbidity data) are frequently unavailable, mortality rates are often used to identify vulnerable populations (SPC, 2004).
4. MDG Target 10: Halve the proportion of people without sustainable access to safe drinking water and basic sanitation by 2015.
5. The MDG Target on developing national IWRM and water efficiency plans by 2005 set at WSSD was adjusted at the 2005 World Summit which called for 'assistance to be provided to developing countries in efforts to prepare IWRM and water efficiency plans as part of their national development strategies'.

Padma Narsey Lal

Chapter 6

Foresight and Innovation for Boosting Agriculture[1]

[The] Pacific region… [will be] a region of peace, harmony, security and economic prosperity, so that all its people can lead free and worthwhile lives. We treasure the diversity of the Pacific and seek a future in which its cultures, traditions and religious beliefs are valued, honoured and developed. We seek a Pacific region that is respected for the quality of its governance, the sustainable management of its resources, the full observance of democratic values, and for its defence and promotion of human rights. We seek partnerships with our neighbours and beyond to develop our knowledge, to improve our communications and to ensure a sustainable economic existence for all.

Pacific Islands Forum Communiqué 2004 – Auckland Declaration

There can be no peace without equitable development and there can be no development without sustainable management of the environment in a democratic and peaceful space.

2004 Nobel Peace Prize winner, Professor Maathai of Kenya

Introduction

Agriculture, an integral part of Pacific societies, has the potential to play a larger role in meeting the needs and aspirations of the local people in a rapidly changing global and domestic environment. Subsistence agriculture has been the primary source of food security, human health and resilience to disasters. It has also been an important element of national economic growth through exports of key common commodities, such as copra. The agricultural sector today has gradually shifted away from subsistence to semi-commercialised and commercialised agriculture. In some countries, a more diversified agriculture, based on export commodities such as sugar, root crops, kava, noni and other horticultural crops, support national economies. The sector continues to grow, and has a potential in many countries to provide for increased food security and employment, particularly in rural areas. In the larger Pacific island countries (PICs), agriculture can provide for a growing demand for food in urban areas and in export markets.

To realise their agricultural potential, each member country's planning and development of the agricultural sector needs to be integral to the national development efforts, as well as reflect a systematic and holistic ecosystem-based management (EBM) approach. Ideally, countries would **know** where they are today, have **foresight** and will be able to provide the **innovation** to systematically address their needs and aspirations to achieve the desired outcomes – i.e. countries must adopt a strategic approach to their agricultural sector development.

Knowing in this context is not only about being aware of the state of agricultural products and production, marketing and trade, but also means an understanding of what has worked and what has not, and the reasons why, including:

- who the stakeholders are, what they do and how they interact with each other – the farmers, processors, marketers, buyers and consumers as well as the policy-makers,
- the current status of our governance structures and how well they support, or do not support, agriculture and other economic activities, and
- the external and internal factors that influence different facets of economy, society and environment.

Foresight is about identifying the kind of agricultural system expected or wanted for the future, as well as the potential role agriculture can play, given the limited resource endowments and the realities of market forces in today's globalised world. Foresight is also about the right kind of society, of governance system; the kind of economy and economic growth that would provide for material needs and comforts; and the nature of environment and resources that would provide for and sustain the population.

Innovation is about generating knowledge, creating technologies, defining and implementing strategies and designing enabling environments that allow people to determine their own destiny. It is about knowing how to harness the interests and energies of people in the Pacific, use old and new ideas and scientific and traditional knowledge to create appropriate technological approaches, governance structures and solutions. Solutions that may help build resilience to the fluctuating market conditions and natural and man-made disasters. Innovation is also about being proactive and taking a long-term view when designing rules and regulations to achieve the desired outcomes for the economy, environment and society. The key is a strategic response to market failure.

In short, **innovation** and **foresight** are about forging a path from the current situation towards a sustainable future. In the context of the national development process, agricultural development, as stated by the Pacific leaders (PIFS, 2004), is about strengthening national sustainable development strategies (NSDS)-based planning, budgetary allocation processes and decision-making processes, reflecting an ecosystem-based development and management approach.

National sustainable development strategies

National sustainable development strategies (NSDS) have been regarded as an integrated planning approach to achieve sustainable development and are defined as '…a participatory and cyclical process of planning and action to achieve economic, ecological and social objectives in a balanced and integrated manner' (International Union for the Conservation of Nature [IUCN], International Institute for Environment and Development [IIED], 1993). The Organisation for Economic Co-operation and Development (OECD) Development Assistance Committee (DAC) has defined an NSDS as:

> *A co-ordinated set of participatory and continuously improving processes of analysis, debate, capacity-strengthening, planning and investment, which integrates economic, social and environmental objectives of society, seeking trade-offs where this is not possible.*
>
> OECD DAC, 2001

As agreed to in the Johannesburg Plan of Implementation (JPOI) and the Mauritius Strategy for Implementation of the Barbados Programme of Action (MSI), NSDS-based decision-making processes involve holistic and programmatic approaches to achieve sustainable development.

A similar process, but with emphasis on scientific and analytical methodology that focuses on the 'how' aspect of NSDS-based planning and development, is advocated under ecosystem-based

management (EBM). The Ecological Society of America (ESA) has identified eight key elements of EBM including sustainability, goals, ecological models and accountability.[2]

Land tenure[3]

For systematic development of the agricultural sector, Pacific islands are faced with a more fundamental issue of access to land, which is a major constraint to substantive growth in the agricultural sector throughout the Pacific. Access to land, a critical factor of production, is restricted because of limited endowments in many small island nations, high population growth and institutional constraints arising from misalignment of customary land tenure and the introduced land administration system, reflecting private ownership.

Land is an important source of subsistence and commercial activity as well as a source of cultural identity (Boydell, 2001). For most rural Pacific island communities, even on the smaller atolls, from 20 up to 90 per cent of their real income (cash plus non-cash) comes from the land, including forestry, agriculture and terrestrial biodiversity. Arable land is limited, varying from less than 1 per cent in Marshall Islands to 24 per cent in Tonga. Recent increases in population have had a direct impact on land use and the relatively small areas of land available for economic development. In many small island states (SIDS) such as Marshall Islands, Nauru and Tuvalu, there is a population density of more than 300 per square kilometre (UNESCAP, 2004). The combination of limited arable land and high populations places major constraint on agricultural development.

Throughout the region, a dual system of traditional (communal) land and land ownership exists in parallel with the introduced notion of ownership of land of the colonising powers. Despite being colonised, indigenous people were not alienated from their land and the majority (83–100 per cent) is customary. In traditional societies, land is often communally owned and unalienable, making it hard for customary owners to access for economic activities. Land provides a sense of identity, a sense of belonging and relationships expressed in concepts such as *vanua* in Fiji, *fenua* in Tuvalu and *enua* in Cook Islands. As Batibasaqa et al. (1999) comment, *vanua* is 'an environment in its totality, including natural and human aspects'. It is an integrative concept bringing together ecological, geophysical, social, spiritual and economic dimensions. The notion of resource ownership, including the nature of individual and group ownership and systems of inheritance, and social relationships (Hviding, 1996), is also a key element of traditional concepts.

In the modern world, land is primarily a commodity, to be owned as private property and used and traded by owners in their own interest and within the boundaries set by formal market and legal systems. Privately-owned land is accepted as collateral by commercial banks for providing credit for economic activities. Where land is leased, a clear definition of rights and conditions including tenure is required before banks will provide loans.

The customary land system is poorly defined and understood. In most countries the boundaries have not been surveyed nor formalised and ownership is not often clear. This lack of clarity makes it difficult for members of communal groups and outsiders to access land for forestry or agricultural development, even ecotourism. In many instances, even where access is available, this has provoked disputes and conflicts. Land-based conflicts in recent times include in Bougainville, Solomon Islands, Vanuatu, Cook Islands and Fiji, just to mention a few countries.

Governance of customary land and associated resources remains a major challenge for the Pacific countries. They must rationalise their communal land ownership and management by formally recording landowning units and land parcels, develop an institutional system for use of land resources, including forest, and environmental biodiversity values and amenities that will

ensure customary ownership is not threatened, while encouraging secure leasing of land that can satisfy traditional and modern demands. The challenge facing almost all the Pacific countries is how to allow access to customary land to members of the landowning group and outsiders while providing an appropriate level of clarity and security in tenureship, without the owners alienating their land.

In the Pacific, as in other parts of the world, many of the interventions have been piecemeal and narrowly framed in the context of specific thematic perspectives rather than taking a systematic look at the entire issue of sources of conflict – customary land ownership, different dimensions of property rights over land, land use and access, and land management. Often interventions have focused on individual issues such as economic growth (tenure security and land rights), agriculture (improving agricultural productivity), and environment (resolving land disputes or supporting sustainable use of natural resources).

Ideally, an appropriate land tenure and administration system design will incorporate the whole spectrum of issues and depend on local circumstances and context. It will reflect among other things key stakeholders and actors involved, their interests and behaviour, the dynamics of the relationship between them and their interaction with the local social, economic and political factors. The dynamics of these interactions would be conditioned by the history of the country; existing formal enabling environment, including the nature of land ownership; use and management rights and responsibilities; the relationship between formal and informal land management systems; the strength of the government machinery to enforce the law and the level of trust in the government and traditional decision-makers (Ramirez, 2002).

In national assessments carried out, for example, for the World Summit on Sustainable Development (WSSD), the Barbados Programme of Action+10 (BPOA+10) and the Pacific Plan, countries have acknowledged that they have limited technical capacity to implement many of the international and regional commitments, including those on land management. In practical terms there is a need, at the national level, to determine and implement specific changes in land policies, land tenure and administration, including reviewing organisational arrangements, national legislation and various decision-making processes. These practical issues have not been adequately addressed in a systematic manner or holistically, if at all, and there is an urgent need to address practical methodological issues that reflect considerations of commitments made internationally as well as those made by forum leaders in regional declarations and decisions.

From a practical point of view, the subject of land-based conflict management – i.e. prevention and resolution – is a governance issue. It is about organisational and institutional[4] arrangements that can provide appropriate incentives to all actors and stakeholders so that their individual and collective decisions do not produce conditions that may become a source of grievance and instead produce an environment of peace and stability. Thus conflict prevention requires a systematic approach to a potential conflict situation and adopting a peace-building methodology that is context-specific.

To ensure productive access to and use of land, PICs need national land reform that is both based on and sensitive to continuing customary ownership, by facilitating a better interface between indigenous and western science and information to ensure sustainable land use. Each country would need to define its own solution, although it could be guided by some common principles underpinned by land resource information. This information should be gathered and integrated into a planning process that is sensitive to local customs. These should relate to land ownership and be adapted to community/local-level land management planning for in situ use of natural

forests, including non-timber forest products and ecotourism, and alternative land-based activities such as agriculture.

Despite sharing some key characteristics of land ownership, each country has its own specific institutional, cultural and economic challenges. No single model can be applied throughout the region. There also lies the need for a new breed of innovators – researchers, analysts and institutional designers – to develop policies and institutional designs. These must encourage commercial use of customary land without threatening the underlying customary ownership, ensuring fair market-based returns to land owners and resource users and equitable sharing of benefits among the current and the future customary landowners.

With this backdrop, the chapter briefly describes:

- The status of agriculture, including land, its 2050 vision
- Challenges in the agricultural sector
- Innovations – NSDS, Pacific Plan and regional integration
- Concluding remarks

Status of agriculture and its 2050 vision

Agriculture, generally based on smallholder farming, is a major source of economic activity and rural employment in PICs. Agriculture, although generally not a major contributor to GDP (representing 20–40 per cent), is often the main source of export earnings, regionally representing around 50 per cent. Agriculture accounts for over 85 per cent of foreign exchange and contributes substantially to total employment, around 30–80 per cent (McGregor, 2006).

The predominant smallholder agroforestry farming systems in PICs provide for a generally high level of food security. Traditionally, farming systems evolved to provide the households with adequate staple root crops and fruits throughout the different seasons. Fresh produce marketing – both domestic and export – grew out of the gradual move by many PICs from subsistence towards cash economies. Marketing started on the premise that the household, having attained food security, would market the excess produce to accumulate household income. For the larger PICs, the agricultural sector has grown to include more specialised production of specific commodities and to larger scales of production of sugarcane, palm oils, coffee, cocoa and recently kava. Smallholder agriculture has proved to be generally more robust and productive, even in the face of adversity. This was evident in Solomon Islands recently, in the case of humanitarian disaster associated with ethnic conflict, and in Bougainville, where the Papua New Guinea (PNG) government blocked imports some 15 years ago, but in neither instance has there been an indication of severe food shortage.

With this broad overview, it is important to recognise the large diversity in Pacific agriculture, and different ways in which it might develop in the future. Based on diversity in island size, resource endowments and the nature of national economy, Pacific islands can be categorised into four groups (see table 6.2) (McGregor, 2006):

- **Category 1**: relatively large countries of Melanesia with substantial natural resource endowments – PNG, Fiji, Solomon Islands, Vanuatu and New Caledonia. They have the best natural resources (more than 90 per cent of land) and the highest populations (more than 85 per cent of the region's population). In Western Melanesia (PNG, Solomon Islands and Vanuatu), agriculture is the main source of employment and livelihoods.

- **Category 2**: the middle-sized Polynesian countries – Tonga and Samoa. These countries have modest land resources, low population growth, and high levels of remittances. Agriculture is an important source of export earnings.
- **Category 3**: land-poor micro-states, predominantly atolls – Cook Islands, Kiribati, Tuvalu, Federated States of Micronesia, Marshall Islands, Niue, Palau and Tokelau. These are among the tiniest nations on earth, spread over a vast area of ocean. They have limited land resources but vast marine resources, and thus agriculture is relatively less important. Some have small but important cash income from copra, with Cook Islands and Niue earning income from diversified agricultural exports; papaya in Cook Islands and taro in Niue. They are highly vulnerable to natural and man-made disasters.
- **Category 4**: agriculture is of limited importance – Nauru, American Samoa, Guam and Northern Marians. Some, such as Nauru, have limited scope for subsistence agriculture and are largely dependent on imported food products.

In general, for all the categories of islands, the long-term future vision for the agricultural sector would comprise different combinations of domestic and export-based production systems. Agriculture, led by smallholder farming systems, would be the main source of domestic food security as well as a source of food to support growing urban populations, in some cases tourism, throughout the region. Primarily in larger Melanesian countries, sophisticated smallholder and larger enterprises taking advantage of the free trade environment under WTO are expected to produce traditional, new horticultural and tree crops for export in which they have particular comparative advantage. Over time, with increasing fossil fuel prices and emphasis on renewable energy, the agricultural sector is expected to become an important source of affordable and environmentally friendly biofuels, particularly on large islands, complementing the decreasing levels of imported fossil fuels. Each PIC has identified increasing reliance on renewable energy as a major development goal.

Agricultural sector challenges

Agricultural challenges in the Pacific are multifaceted. Major challenges are largely as a result of the 'small islands large oceans' phenomenon, small domestic markets and economies that rely on limited export commodities, highly vulnerable to market fluctuation. Large distances between the PICs and their main export markets mean high transportation costs and reduced ability to compete in the global markets. Added to this are domestic conditions that significantly affect local production and marketing, including some outdated production technologies, poor infrastructure, poor enabling environment for policies, and the presence of often inappropriate research and development institutions (WSSD, 2005).

Farm production technologies and practices

Increasing production in the Pacific has often relied on traditional farming practices of expanding land area under cultivation, heavier use of fertilisers or pesticides and larger labour inputs. Some mechanisation has occurred, but mainly on larger farms. Small-scale technologies are available in Asia, but are not easily obtainable. There is limited innovation into the breeding of local crop varieties for increased productivity, selection of varieties for characteristics demanded by consumers or for disease resistance.

Many farmers are finding that environmental problems are on the increase, such as sugarcane growers and ginger farmers in Fiji. Some exercise poor farm management, cultivating lands not

suitable for agriculture or not carrying out soil conservation. Farmers do not generally adopt available efficiency-raising technologies. Resource-saving technologies for minimising soil erosion from sloping lands are not very common, although extension workers have promoted this for several decades and there are pockets of success.

Farmers often take short-term effects of prices and costs into account, without a longer-term view. In the face of rising fertiliser and pesticide prices, farmers often cut their use to reduce costs, without necessarily considering alternative farming practices. Although extension workers have been promoting more integrated approaches, such as integrated nutrient and pest management, these have not been adopted across the region. Considerable systematic efforts are required to encourage farmers to adopt such resource-saving and environmentally friendly practices.

In many instances, farmers will need to invest in labour, management skills and knowledge, approach farming in a holistic manner and adopt it as a business venture, while also adopting resource-conserving and efficiency-improving technologies.

Enabling environment – infrastructure, government policies and institutions

Inadequate infrastructure, inappropriate or poor government policies and institutions have been the source of major impediments to private sector-led agricultural development throughout the Pacific.

With limited road infrastructure and air and sea transport, communication has been an important reason for low, even stagnant, agricultural productivity and a relatively high cost of production, transportation and marketing (Fleming and Hardaker, 1995; Hardaker and Fleming, 1994). Adequate roads are a basic necessity for marketing. In PNG, for example, the creation of Highland Highway led to the establishment of the coffee industry, PNG's most important source of livelihood.

However, in many of the Category 1 Melanesian countries, this condition is not met. Where it is met, as in Fiji, the cost of maintenance is so high that road conditions deteriorate rapidly. Similarly, for all PICs with a large number of small islands, interisland shipping services are vital. Throughout the region, interisland shipping to remote islands has declined overall due to the demise of the copra industry and migration to 'urban' areas.

It is not just the presence of poor physical structure that has impeded key transport services. Regulatory and incentive structures and policies that discouraged competition have also hampered interisland shipping services. Pacific islands commonly use distortionary policies, often in response to single issues, and these have slowed the pace of agricultural development.

Pacific island states are highly regulated, generating significant costs. Many countries also have many trade-distorting policies, such as self-sufficiency in rice in PNG and Solomon Islands. Such policies often prop up agricultural industries that are not viable.

Price stabilisation schemes have also been used to support failing agricultural activities and discouraged investment into other crops. Price subsidies on fertilisers and pesticides have encouraged excessive use, often leading to contamination of the environment.

Due to poor government policies and regulatory environments, the costs of economic activities are often high in comparison to their neighbours. It takes some five to almost ten times as long to start a business in the PICs as it does, for example, in New Zealand (Dhar and Luthria, 2005).

Poor telecommunications have affected many developments in rural areas, including agriculture. This, however, is gradually changing in some countries. One example is Fiji, where the recent

boom in, and increased range of, mobile phones has meant that growers, buyers and transport providers have all begun to benefit from instant communication.

Farmers and marketers in western Melanesia lag behind considerably. Recently in Solomon Islands there have been signs of improvement; the People First Network is leading the way in developing internet-based communications in remote islands. Farmers and fishermen and women are able to access market price information remotely and negotiate better prices.

The use of parastatal monopolies to market commodities, such as cocoa, is another example of poor governance structures that have discouraged private sector development. Poor performance of such parastatal bodies can be found in countries such as Fiji, Samoa and Vanuatu. The cocoa industries barely exist in Fiji and Samoa, and the Vanuatu industry is performing poorly. In contrast, in PNG, the government stayed out of marketing of tree crops but there has been competitive selling of coffee, cocoa and palm oil, increasing the importance of these industries as a source of rural GDP and employment in PNG.

Co-ordination and harmonisation of development partner support

PICs face major challenges in co-ordinating and harmonising development partner support. As was recognised in the JPOI and MSI, development partner support tended to be project-based, piecemeal and often reflecting donors' priorities rather than recipient countries' needs and main concerns. One of the results of this has been ineffective, often wasteful use of donor resources in the Pacific (Hughes, 2005). In response to such ineffective use of development partner resources globally, donors have made the Paris Declaration for Improving Aid Effectiveness and are also committed to the Pacific Principles of Aid Effectiveness to help co-ordinate their support. This alone cannot help increase aid effectiveness. For this process to be effective, further innovations are required to strengthen national government and sectoral agencies' ability to prioritise and cost their priorities, and thus to be in a position to better engage with development partners.

Innovation – NSDS strengthening

To realise the sustainable development vision of the Pacific region, agriculture, people, products, policies and practices must come together, where people are empowered to take advantage of opportunities and freely respond to domestic and export market demands. From a national planning and development perspective, a new way of thinking is required. As noted by Dalal-Clayton and Bass (2002, p.29), this will include:

- a move away from producing and implementing fixed development plans, which are 'blue print' approaches, towards adopting an adaptive process that is continuously being reviewed and improved,
- a move away from seeing development as the government's responsibility towards a situation where it is the responsibility of society as a whole,
- a move away from centralised and controlled decision-making towards a process which is participatory and involving all relevant stakeholders in a concerted effort and in a transparent negotiation process,
- a move from a focus on outputs (projects, legislations, plans) towards a focus on systems and outcomes (impacts) on people, and the quality of participation and management process,
- a move from sectoral planning towards an integrated holistic planning, and
- a move from donor-driven 'projects' towards domestically-driven development.

For the agricultural sector, strengthening of national policies requires a change in direction and the adoption of a systems approach. This would involve the application of old knowledge but in new ways, using existing knowledge to create a new and more holistic understanding of the agricultural system, as well as the innovation in customary land management.

Many of the challenges require a change in the approach of all concerned: policy-makers, the private sector, scientists, researchers, policy analysts and farmers. Strengthening national agricultural policies and sector plans linked to NSDS could provide a solid foundation for this change.

A strengthened NSDS-based sectoral planning, policy and budgetary process, would, among other things, mean:

- Agricultural development and resource conservation are treated as integral parts of the broader national development, providing economic growth, basic human livelihood and security. Sustainable economic development cannot be achieved without adequately addressing the issue of sustainable livelihood, equitable distribution, food and other forms of security. The ability of the state to manage these conflicts through traditional law enforcement needs to be considered, together with the formal system of dispute resolution.
- The adoption of a systems view of decision-makers and actors, where stakeholder-based approach is adopted in national and sectoral development planning and policy formulation. In such a stakeholder-based approach, all relevant groups – land owners, farmers, processors, marketers, transport providers, environmentalists, government, the private sector, churches, youth and women's groups – are involved in problem analysis, solution identification, strategic planning, and implementation.
- The adoption of a systems view of policies, rules and regulations, where governments take a broader view in linking policies related to trade, competition and economic regulations, private sector development, environment protection and conservation, subsidies to farmers and other stakeholders and targeted taxes, as part of an integrated system working to generate maximum benefits.
- The adoption of a systems- and outcomes-focused view of science–economics–people–policy analysis, where governments and other decision-makers would consider all forms of information and knowledge (scientific, economic, social and environmental, as well as traditional knowledge) when designing policies and institutions. A balanced three pillar, economic, social and environmental-based approach would thus be adopted.
- The adoption of a systems view of the production–supply–demand–consumption value chain and development–conservation interaction. Researchers, policy-makers, farmers, environmentalists and research and development (R&D) specialists would take into account not only technical issues, such as appropriate breed, agronomy, pests and diseases and environmental conservation issues, but also market conditions, demand, and supply, prices and costs which determine profitability of agricultural and ecotourism ventures.
- The adoption of a systems view of conservation and production, where particular attention is paid to the issue of biodiversity of plant genetic material, protection and conservation of farmers' varieties, traditional knowledge and intellectual property rights. It would mean that in response to dangers posed to plant genetic resources (PGR) by socio-economic shifts, climate change and pest and disease outbreaks, a regional and international approach to conservation, protection and best utilisation of plant genetic resources will be adopted.
- The adoption of an approach where the enabling environment of customary property rights and land administration systems will be redesigned to meet the challenges of encouraging

equitable access to customary land by the members of landowning groups as well as other investors. It will encourage equitable sharing of the benefits from the use of land and minimise conflict.

To develop, as well as fully operationalise such a strengthened NSDS-based agricultural sector plan, a new breed of innovators and knowledge managers is required. Macro-economic planners and fiscal management must think differently and recognise the relevance of strengthened sector plans and medium-term budgeting processes, and work with line ministries to develop appropriate prioritised and costed sectoral plans.

Agricultural scientists and researchers would need to adopt an EBM approach with a focus on 'client first'/'farmers first' or 'client first'. Such an approach in analysis, policy and institutional design and development would mean focusing on the issue of maximising long-term income stream at minimal costs and risks, equitable development and minimising scope for intra and intergenerational conflict.

Maximising profit for farmers would involve identifying those characteristics that are demanded by consumers and then, for example, setting the breeding programme that targets that goal. This is in contrast to the traditional focus of breeders and researchers on maximising yield and outputs. Farmers would need innovations that would help them adopt regenerative technologies (Pretty, 1995), including integrated pest management, integrated nutrient management, farming practices that encourage land rehabilitation and prevent soil and nutrient loss, and reduced contamination and pollution of the environment. Another set of innovators may be required, e.g. when dealing with many trade-related technical issues. Thus, for example in the area of biosecurity and quarantine control, PICs could expect to benefit from national biosecurity law that complies with the WTO-SPS agreement and Convention on Biological Diversity.

Policy-makers would need a new type of analyst, who can provide them with evidence-based policy advice reflecting bioeconomic benefits and costs, to select different policy options. Each of these clients requires digested and integrated interdisciplinary analysis-based advice that balances the three pillars of sustainable development – economic, social and environmental goals. This, too, requires innovation in national and regional organisational structures, and for those structures to be flexible enough to allow the bringing together of expertise from different disciplines, as required.

When faced with challenges of increasing access to customary land, countries should use robust information systems to engage with customary land owners and land administrators, researchers and politicians from all camps. They will collectively arrive at a common understanding of key issues associated with the nature of ownership rights, decision-making rights, rights to use and lease alienation rights. They will work with lawyers and institutional designers, government land administrators and land managers, and traditional decision-makers. Together they will design and develop appropriate enabling institutional and governance environments for increased economic activities while minimising the scope for disputes.

When taking such an integrated approach, institutional designers would adopt a harmonised and pragmatic national regulatory framework and market-based incentives that enable effective trade facilitation while establishing appropriate biosecurity operations at the border to minimise the risk of entry of exotic pests and diseases. Furthermore, trained staff and provision of equipment would help improve enforcement of biosecurity regulations and increase trade facilitation.

Knowledge, foresight and innovation – integration of NSDS – EBM-based sustainable agriculture development action plan

For agricultural development in the Pacific, the focus of knowledge, foresight and innovation will be on the entire system, addressing issues related to the country as a whole as well as each of the subsystems, their connectivity and interaction. From a practical perspective, strengthening of NSDS–EBM-based sustainable agriculture development action plans can facilitate a more systematic, transparent and accountable use of domestic resources towards priority issues on all levels. Such an approach can be particularly effective if the agricultural plan is developed using a systematic approach such as stakeholder and other situation analysis, problem tree analysis and solution and strategy formulation guided by the EBM core elements and principles (DFID, 2002). It will also be effective if explicit prioritisation of expected outcomes and outcome-based programmes of strategies and initiatives be prioritised and appropriately sequenced and costed.

A new type of researcher, policy analyst and institutional designer would work together to identify and implement the organisations, processes, policies, strategies and instruments necessary to produce the desired outcomes. A new type of decision-maker is required to strengthen domestic public–private–community partnership, and encourage private sector-led agricultural development, and to negotiate external support.

Equipped with the NSDS-linked sustainable agriculture development plan of action (prioritised and costed sector plan), member countries could be in a better position to negotiate with development partners for a co-ordinated set of technical and financial support to complement their national efforts, using the NSDS-linked sectoral plan of action as the platform for engagement. Some PICs, such as Tuvalu and Samoa, have made efforts to strengthen their NSDS-linked sector planning and budgetary process and to use their prioritised sector plans to allocate their domestic resources and use these as platforms to negotiate a more relevant package of donor assistance.

The Pacific leaders have recognised the importance of countries strengthening their NSDS and adopting a systematic approach to the development and management of agriculture and forestry sectors. In 2007, they called upon the regional organisations to assist member countries to develop NSDS-based agriculture and forestry policies, plans of action and budgetary processes. They called for the mainstreaming of conservation issues into national planning and budgetary process, involving key stakeholders (PIFS, 2007). Operationalising the forum leader's 2007 decisions is a major challenge in the region when countries have limited resources, institutions are weak and the necessary approaches are relatively new, requiring everyone concerned to think and work in an unfamiliar way.

Innovation, the Pacific Plan and regional integration

The region has recognised that for most countries, due to limited capacity, systematic and co-ordinated development can only be addressed through strengthened regional integration, relationships with developing partners and public–private–people links. Stronger partnerships are necessary between scientists, government policy and decision-makers and stakeholders whose livelihood is to be enhanced. Innovation is critical to such reforms.

At regional level, the Pacific leaders see the Pacific Plan as the main instrument for promoting their vision of regionalism to deliver real benefits for the people. The Pacific Plan articulates the philosophy of creating stronger and deeper links between the sovereign countries, through regional co-operation and integration where they add to national efforts, without compromising sovereign rights and responsibilities.

The Pacific Plan is based on the four pillars of economic growth, good governance, sustainable development and security. It contains reference to many regional strategies and initiatives under each of the four pillars, all of which have implications for the agricultural sector.

Included in the Pacific Plan are priority strategies related to:

- **Sustainable development** – strengthening national sustainable development strategies; regional strategies on conservation of natural resource and ecosystem-based management of land and marine resources; the Regional Framework for Action on Disaster Risk Reduction and Disaster Management; the Pacific Islands Framework for Action on Climate Change; and the Pacific Islands Energy Policy, in which the potentially increasing role of renewable energy, is discussed.
- **Good governance** – such as Forum Principles of Good Leadership and Accountability; and Forum Principles of Good Governance.
- **Security** – such as the Aitutaki Declaration on Regional Security Co-operation; biosecurity; and the Regional Framework of Action on Disaster Risk Reduction and Disaster Management.
- **Economics and trade** – such as the Pacific Island Countries Trade Agreement (PICTA) and the Pacific Agreement on Closer Economic Relations (PACER). Under the sustainable development agreements on regional quarantine and customs services, increasing competition and improving the regulatory environment for private sector development and implementation of the regional digital strategy.

These different international instruments, although focused on different thematic areas, have some common guiding principles and strategies. A key point emerging from these instruments is the need for **strengthened national policies, institutions and decision-making processes** that reflect the adoption of a systems approach, including in agriculture, forestry and other land-based resources and environments. This forms the major challenge for all concerned.

The Pacific leaders have acknowledged that these regional strategies must be operationalised at national level to have any meaningful impact. Major innovations are expected within and between regional organisations. Under the Pacific Plan, and following the recent decisions made by the heads of Council of Regional Organisations in the Pacific (CROP) agencies, regional organisations are expected to provide co-ordinated and integrated policy advice to member countries. However, different regional organisations were established as autonomous organisations with their own respective governing councils and mandates. As a result, over time, regional organisations have gradually evolved to a stage where there are overlapping interests and activities, but without the range of technical and social science expertise that may be required for a particular policy analysis. At times complementary expertise are found scattered across several different organisations and have difficulty in coming together to provide comprehensive policy advice.

Recently, efforts have been made by CROP agencies to co-ordinate their respective activities, although these have been constrained by the existing institutional architecture and organisational structures. The Pacific Plan is expected to help rationalise regional institutional frameworks, organisational structures and activities and streamline the support to member countries. It is also expected to help increase aid effectiveness at regional level.

Conclusion

The agricultural sector has the potential of providing at the very least basic food security and livelihoods in all PICs. In some larger countries, it has the potential to provide the raw and

processed commodities needed to fulfil growing demand from the urban and tourism sectors, and meet the need for the foreign exchange and export trade. In this light, the agricultural sector has a critical role to play in the broader national development effort.

To develop agriculture in a sustainable and cost-effective manner, integrated NSDS-linked sectoral planning, prioritisation and budgeting processes are needed in promoting systematic and cost-effective use of domestic and development partner resources. There will be three categories of strategies: resource-conserving technologies; supportive enabling environments for policies, infrastructure and technical capacity and strengthening of institutions and decision-making processes; and stakeholders' involvement. All stakeholders, farmers, foresters, scientists, researchers, policy analysts, extension-workers, would ideally adopt a more systematic view of the world, acquire new understandings, values and methods, and become agents of change.

Central to the development of agriculture in an environment of changing needs and aspirations, global trade regimes, climate change and fluctuating social, economic and environmental conditions is the embracing of new ways of **learning**. The focus of learning would be less on **what is learned** and more on **how** it is learned, and **with whom.** It is also about harnessing the interests and energies of the people of the Pacific, using old and new ideas, scientific and traditional knowledge, and creating enabling environments that allow people to control their own destiny as well as that of their nation.

This is indeed a challenge, particularly since the traditional education system generally produces experts trained in individual subsystems, around individual discipline-based specialisations. Agronomists, breeders, macro-economists, trade economists, marketing specialists, meteorological scientists, sociologists, anthropologists and policy advisers, have been largely working in their own respective worlds often taking a one-dimensional view and tackling individual issues without necessarily looking at connectivity. There is a need to address multifaceted problems in a more holistic, integrated and co-ordinated manner to produce the synergistic outcome.

It is also a challenge when past research and policy formulations processes have largely been 'top-down', with limited if any involvement of the broader communities – farmers, processors, marketers, the private sector, and women's and youth groups. Linked to this is the challenge of enhancing the importance of traditional knowledge and wisdom.

The Pacific leaders have defined the vision and have made specific commitments towards following an integrated approach, as well as adopting a more systematic NSDS-linked sectoral planning and budgetary process to guide allocation of national and development partner resources. The challenge is now for a new breed of innovators to put their vision into operation. For research and training institutions, and regional government organisations, the challenge is to produce this new breed of innovators – scientists, researchers, policy analysts, economists, farmers and other actors and decision-makers – who can help generate new ideas to boost and sustain Pacific Plan agriculture for economic growth, sustainable food production, peace and security.

Table 6.1 Key characteristics of Pacific island countries

Country	*Land area (km^2)*	*Population*	*Geographic type*	*Importance of agricultural sector*
American Samoa	240	68,700 (2002)	High islands, with a few atolls	Minor. Some subsistence and limited market gardening
Cook Islands	180	20,400 (2002)	High islands and atolls	Important. Main export earner. Subsistence a significant component of GDP
Federated States of Micronesia	702	133,150 (2000)	High islands and atolls	Some. Small export earnings, some domestic cash income, and some subsistence
Fiji	18,376	824,700 (2000)	High islands. A few minor atolls	Fundamental. Main employer and net foreign exchange earner. Subsistence a significant proportion of GDP
French Polynesia	3,521	233,500 (2000)	High islands and atolls	Some. Small export earnings, domestic cash income, and subsistence
Guam	549	163,941 (2003)	High island	Limited. Some domestic market gardening
Kiribati	726	98,600 (2003)	Predominately atolls	Considerable. Important for subsistence. Copra is important for outer-island cash income and some foreign exchange
Marshall Islands	720	73,600 (2002)	Atolls	Limited. Some subsistence and income earned from copra
Nauru	21	12,329 (2001)	Raised coral island	Insignificant
New Caledonia	19,103	220,000 (2000)	High island	Important, particularly in the south
Niue	258	2,145 (2003)	Raised coral island	Significant. Subsistence and some root crop exports
Palau	475	19,000 (2001)	High islands and atolls	Some. Market gardening
Papua New Guinea	461,690	5,100 000 (2003)	High islands – a few small atolls	Fundamental. Overwhelming source of employment. Provides a significant proportion of net export earnings. Subsistence is a significant component of GDP
Samoa	2,934	178,200 (2003)	High islands	Fundamental. Traditional agriculture is the underlying strength of economy
Solomon Islands	29,785	470,000 (2004)	High islands and a few atolls	Fundamental. Predominant source of employment. Provides a substantial proportion of net export earnings. Subsistence is a significant component of GDP
Tokelau	12	1,400 (2003)	Atolls	Some. Subsistence
Tonga	696	108,200 (2003)	High islands and a few small atolls	Fundamental. Agriculture has led economic growth recently
Tuvalu	26	11,000 (2002)	Atolls	Some. Subsistence and some cash income from copra
Wallis and Futuna	255	14,900 (2003)	High islands and atolls	Some. Subsistence
Vanuatu	12,189	199,500 (2003)	High islands and a few small atolls	Fundamental. Predominant source of employment. Provides a substantial proportion of net export earnings. Subsistence is a significant component of GDP

Table 6.2 Island groupings and 2050 vision for the agricultural sector

Country grouping	*Current status*	*Expected 2050 vision*
Category 1: relatively large countries of Melanesia and best natural resource endowments – PNG, Fiji, Solomon Islands, Vanuatu and New Caledonia	Have large natural resource endowments (more than 90 per cent of land), have highest populations (more than 85 per cent of the region's population)	Higher efficiency of traditional food production and increased household food security
		Increased volume and quality of domestically marketed foods
	In Western Melanesia (PNG, Solomon Islands and Vanuatu), agriculture is the main source of employment and livelihoods	Increase in quality and quantity of commodities where countries have comparative advantage (coffee, cocoa and palm oil in PNG and Solomon; horticulture and spices in Fiji)
		Diversified agricultural export base, focusing on horticultural commodities of comparative advantage, such as tree crops indigenous nuts and spices
		Use of agricultural crops, such as coconut and sugarcane for biofuel
		Domestic urban and tourism-led increased agricultural produce
Category 2: middle sized Polynesia – Tonga and Samoa	Countries have modest land resources	Smallholder farming systems remain core to food security, underpinned by remittances
	Tonga enjoyed agriculture-led growth with the development of squash and vanilla. The economy is highly vulnerable because of the high dependence on squash	Increased domestic market for agricultural food, with improvements in diet reducing lifestyle diseases
		Improved quality and export of commodities such as squash based on environmentally sustainable production, and quality vanilla
	Samoa was the lead taro exporter before the taro blight disease decimated the industry. These economies have low population growth, and high level of remittances	Increased export of traditional foods to Tongans and Samoans living abroad
		Increased horticultural exports from Samoa based on crops such as papaya and rambuttan
Category 3: land-poor micro-states, predominantly atolls – Cook Islands, Kiribati, Tuvalu, Federated States of Micronesia, Marshall Islands, Niue, Palau and Tokelau	These are the smallest nations on earth, spread over a vast area of ocean. They have limited land resources but vast marine resources, and thus agriculture is relatively less important	Increased household food security as a result of improved gardening techniques, increased composting, growing of tolerant fruit trees, overcoming pests and diseases
		Diversified coconut industry, moving away from copra to biofuel and edible oil production
	Some have small but important cash income from copra, with Cook Islands and Niue earning income from diversified agricultural exports; papaya in Cooks, and taro in Niue. They are highly vulnerable to natural and man-made disasters	
Category 4: agriculture is of limited importance – Nauru, American Samoa, Guam and Northern Marians	Some, such as Nauru, have limited scope for subsistence agriculture and are largely dependent on imported food products	Limited scope to increase household security through increased composting of human and other organic wastes

References

Batibasaqa K, J Overton and P Horsley (1999) Vanua: land, people and culture in Fiji. In J Overton and R Scheyvens (eds.) *Strategies for Sustainable Development: experiences from the Pacific*. Sydney: University of New South Wales Press, pp. 102–106.

Boydell, S (2001) Land Tenure and Land Conflict in the South Pacific. Consultancy Report for Food and Agricultural Organization. Suva, Fiji.

Dalal-Clayton, B, and S Bass (2002) *Sustainable Development Strategies: a resource book*. OECD DAC, UNDP. London: Earthscan.

DFID (2002) *Tools for Development: a handbook for those engaged in development*. London: DFID.

Dhar, S, and M Luthria (2005) Pacific 2020 Background Paper on Framework for Growth. Prepared by the World Bank on behalf of AusAID, Canberra.

Fleming, E, and J B Hardaker (1995) *Strategies for Polynesian Agricultural Development*. Canberra: National Centre for Development Studies, ANU.

Hardaker, J B, and E M Fleming (1994) Implications of Population Growth for Managing Sustainable Agricultural Development in the South Pacific Island Nations. *Australian Development Studies Network Development Bulletin* 31, pp. 12–14.

Hughes, A V (2005) Strengthening Regional Management: a review of the architecture for regional co-operation in the Pacific. Consultative draft report to the Pacific Island Forum, August 2005.

Hviding, E (1996) *Guardians of Marovo Lagoon: practice, place and politics in maritime Melanesia*. Pacific Islands Monograph series 14. Honolulu: University of Hawaii Press.

IUCN/IIED (1993) National Sustainable Development Strategies and Other Comprehensive Environment and Development Strategies. Review draft, IUCN. Gland, Switzerland.

Maathai, W (2004) 2004 Nobel Peace Prize winner, interview with Geoffrey Lean on Planting Security. Available at: http://www.unep.org/ourplanet/imgversn/154/maathai.html [last accessed July 2009].

McGregor, A (2006) Pacific 2020: background paper on agriculture. Based on 2005 Agriculture Roundtable meeting. AusAID Trade and Development Office, Canberra.

OECD DAC (2001) Strategies for Sustainable Development: practical guidance for development co-operation. Paris: OECD.

PIFS (2004) Pacific Islands Forum Communiqué 2004. Auckland Declaration, The Leaders Vision. Available at: http://www.forumsec.org.fj/pages.cfm/about-us/leaders-vision/ [last accessed June 2009].

PIFS (2007) Project proposal on Land Management and Conflict Minimisation. Suva, Fiji.

Pretty, J (1995) *Regenerating Agriculture: policies and practice for sustainability and self-reliance*. London: Earthscan.

Ramirez, R (2002) A Conceptual Map of Land Conflict Management: organising the parts of two puzzles. FAO report, Sustainable Development Department. Available at: http://www.fao.org.sd/202/IN0301a4_en.htm [last accessed August 2007].

UNESCAP (2004) UNESCAP Population Density Data 2004. Available at: http://www.unescap.org/STAT/data/statind/pdf/t5_dec04.pdf [last accessed June 2006].

WSSD (2005) Based on Mauritius Meeting on the Further Implementation of the Barbados Plan of Action: sectoral reviews for the Pacific Plan. Suva, Fiji: PIFS.

Notes

1. This chapter extensively draws on a PIFS paper presented at the CTA/USP Regional Workshop, Innovations and Foresight for Boosting Agriculture, 16–19 July 2007, Suva, Fiji.
2. http://www.esa.org/science_resources/ [accessed February 2011].
3. Based on the PIFS 2007 project proposal on Land Management and Conflict Minimisation, Suva: Fiji.
4. Institutions are defined as rules and regulations (formal institution) and custom and norms (informal institution).

Chapter 7

David Barrett

Renewable Energy and Energy Efficiency

Preamble

It has long been recognised that the sustainable supply of energy services is an imperative: it delineates the viable developmental options that any sovereign island nation can select as it caters to its current and future generations. Energy services – **the appropriate use of energy to achieve desired productive outputs** – plays a crucial role in facilitating the implementation of nation-specific options for all small island developing states (SIDS) regions (Caribbean, Pacific and African and Indian Ocean SIDS).

Implicit in the sustainable development of SIDS are global economic issues for which SIDS have special vulnerabilities, as already identified in the Barbados Programme of Action (BPOA) (Annex I, Part One, IV). Some of the strategies for economic success and indeed survival are:

- the production of value-added products as a competitive alternative to high volumes and low prices,
- niche marketing as a competitive strategy,
- producing an educated, skilled and trainable workforce to attract higher paying jobs and technologically driven markets,
- efficiency, productivity and energy conservation to maximise foreign exchange earnings and retention, while improving self reliance, and
- import substitution and improving energy security.[1]

The development of viable industries is also a critical insert to sustainable economic development. All these strategies are energy dependent.

Sustainable social targets for SIDS are also energy driven to a large degree. For instance, the following targets are all energy reliant:

- strategies for improving the quality of life, including modern, convenient and safe energy supplies,
- less labour-intensive tasks,
- modern transportation services,
- up-to-date, effective health services,
- improved life expectancy,
- facilitating effective education,
- reducing poverty and improving national security,
- increasing food supplies, and
- providing recreational or inspirational settings conducive to emotional health.

Environmental health also depends on sustainable and cost-competitive energy options, through the careful selection of mechanisation for sustainable livelihoods, energy resources with fewer environmental aspects, lower and reversible impacts, and a reduced need for end-of-pipe treatment. At the same time, energy options used for addressing environmental impacts should produce economic, energetic and productive collaterals. As BPOA suggests (Annex I, Part One, III, 1, 2 and 3), many of the global phenomena (such as global climate change and sea-level rise) affecting SIDS are energy derived and exogenous, so collaboration in global energy strategies is a proactive stance. If the Millennium Development Goals (MDGs) are used as a template for SIDS against which the importance of energy can be measured (as rehearsed above), it becomes apparent that the eight developmental goals encapsulating economic, social and environmental issues, cannot be achieved by 2015[2] without securing adequate energy services in the short term.

Driving forces for implementing non-conventional energy options

The growing need for adequate energy services has been somewhat stymied, as the conventional fossil fuels upon which SIDS have depended are rapidly failing in supply volumes, stability of affordable prices and reliability of supplies.

The global scenario affects energy security for SIDS on the supply side. World supply/demand forecasts[3] a demand of 87.8 million barrels per day (bpd) by 2011; however, by June 2010 supplies of only 86.1 million bpd were being produced. This represents a 1.7 million bpd supply shortfall, which could easily be exacerbated by the average global demand growth of approximately 2 per cent. We now live in the reality of the Oil Peak[4] where the rate of new discoveries and production is lagging behind the rate at which we consume these fossil fuels. Supply issues are aggravated by:

- diminishing OPEC[5] spare capacity,
- greater demand for higher environmental and performance specifications, as proportionately more heavy and medium sour crude are found,
- decline of major non-OPEC production such as North Sea, US Gulf of Mexico (GOM) and Alaska,
- volatile geopolitical and unpredictable weather incidents disrupting supplies,
- rapid economic growth of developing and industrialised nations, and
- aged infrastructure and decline in new exploration and refinery investments.

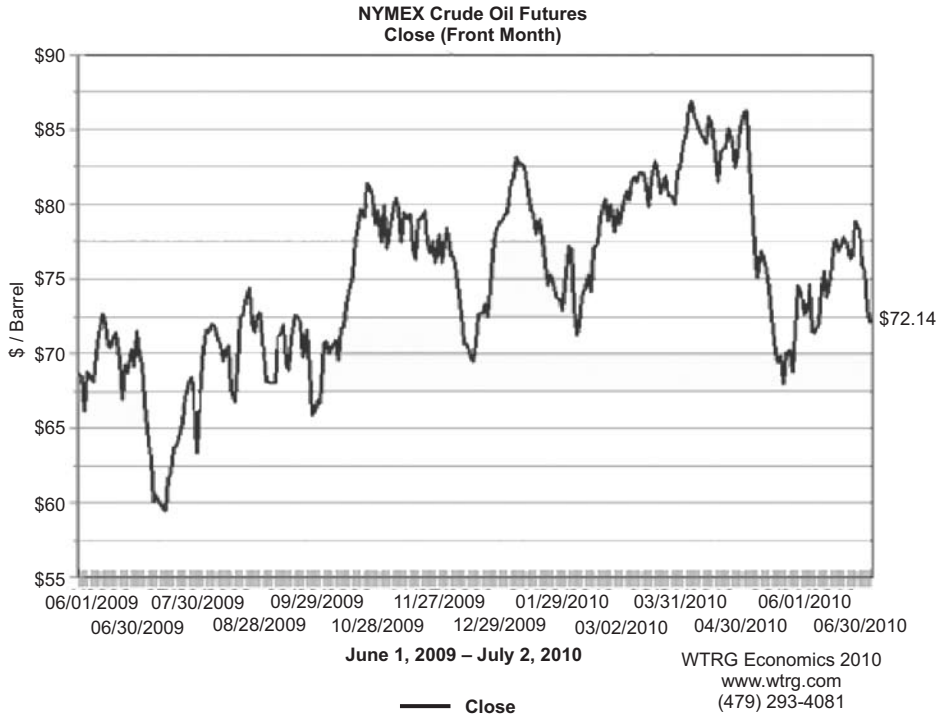

Figure 7.1 NYMEX crude oil futures (front month)
Source: WTRG Economics, www.wtrg.com [last accessed August 2010].

These factors have not only caused oil prices to break old thresholds (e.g. US$94.53 per oil barrel [bbl] 31 October 2007, NYMEX WTI for December 2007[6]) but have also created a new threshold of US$100/bbl and sustained new price floors of US$30–35/bbl. After declining to around US$40/bbl at the height of the global financial crisis, oil prices are on the increase, reaching US$80.87/bbl by 3 March 2010 (see figure 7.1). Now more than ever, SIDS are reminded that 'Energy dependence is a major source of economic vulnerability' (Mauritius Strategy, para. 41).

These volatile fossil fuel prices have wreaked havoc for national development planning and economic strategies. In Jamaica for instance, approximately 90 per cent of the energy mix comes from imported energy. Jamaica's current ability to meet developmental targets is therefore severely hampered by the consumption of 65–70 per cent of its export foreign exchange earnings, or more than 15 per cent of its GDP, to import more than 25.7 million bbls of petroleum products. Similarly, up to 40 per cent of national budgets and 46 per cent of total national revenues of the Pacific islands go to importing fossil fuels (His Excellency Ambassador Enele S Sopoaga).

Natural gas, a long-term more price-stable product has surrendered to the vicissitudes of price movements, reaching as high as US$15 per one million British thermal units (mmbtu) in early 2006, and declining to US$8.33 per mmbtu[7] 31 October 2007. However, following the global financial crisis, natural gas prices have declined. By 3 March 2010, natural gas was US$4.78 per mmbtu (see figure 7.2).

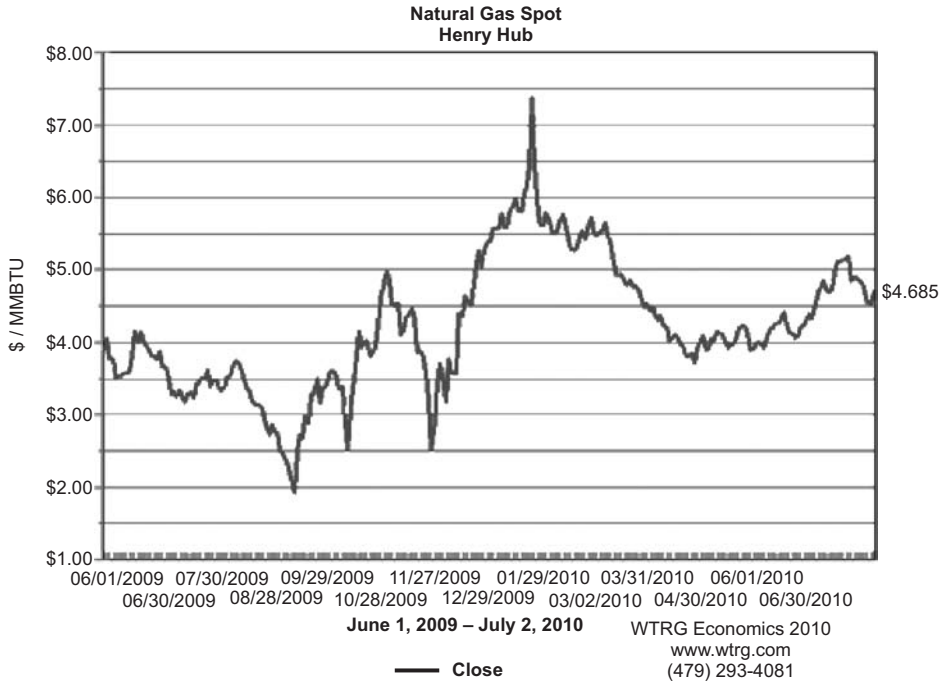

Figure 7.2 Natural Gas Spot: Henry Hub
Source: WTRG Economics, www.wtrg.com [last accessed August 2010].

Though more steady in the market, coal prices have also raised dramatically to US$70.50 per metric ton (mt) CIF (cost, insurance and freight). Coal prices were significantly influenced by the European heat wave in August 2006.

Continued dependence on fossil fuels is therefore contrary to energy security, because their supply is finite and there is unpredictability in pricing over long periods. Additionally, there are growing quality constraints as regional and international fuel harmonisation and clean fuel trends change (e.g. reduction of fuel sulphur to 0.5 per cent for power generation, 30 parts per million (ppm) for gasoline and 15ppm for diesel: US, Department of Energy, 2010).

As stated by the Executive Secretary, United Nations Framework Convention on Climate Change (2007): 'The IPCC found that climate change is unequivocal and is caused largely by human activities that release greenhouse gases'. International efforts have been galvanised to stem global warming (e.g. Joint Implementation [JI] projects and Clean Development Mechanisms [CDMs], with their agro- or forestry-based closed carbon loops and wind power generation) and these in turn have raised the demand for renewable energy options, non-petroleum fuels or fuel blend compromises (e.g. biofuels). Stand-alone or distributed solar photovoltaic generation systems have also become a preferred option, as they are cleaner, less impacting and more viable. In this context, SIDS must focus on the areas of greatest energy demand and implement renewable energy technology(ies) (RET)[8] and energy efficiency and conservation (EE&C)[9] initiatives.

The strategic sustainable development of SIDS therefore lies first in the concurrent and strategic actions of (i) reducing the rate of growth of energy consumption (energy conservation), and (ii) producing more high-value outputs from less energy (energy efficiency). This is a short-term and

sustainable solution for working towards full energy security, global competitiveness and achieving rapid social and economic development against the backdrop of global energy events. Finances could initially be focused on making early, large energy savings on the supply side to large-scale commercial and industrial sectors, which skew national energy demand (e.g. heat and power demands by hotels, sugar cane processing and minerals), followed by transportation and domestic consumers. The proportion of energy cost relative to total production cost in the cement industry, for example, is approximately 55 per cent; however, the potential energy savings could be 10–50 per cent, depending on the EE&C application (Wright, 2003). In Jamaica, where the cement industry is responsible for coal imports equivalent to 1.2 per cent of national energy consumption, energy efficiency becomes an opportunity for significant savings. Similarly, bauxite/alumina processing in the country consumes more than 36 per cent of petroleum imports and is responsible for a 50 per cent increase in energy intensity. Transportation, commercial and residential buildings may consume in the order of 20 per cent and 30 per cent of the energy use in island economies.

Second, the strategic sustainable development of SIDS should involve short-term application of renewable energy technologies (e.g. cogeneration and biofuels), to provide the additional energy required to close the gap between the current energy baseline demand and the future demands. In the short- to long-term, renewables should also be used as a strategic option to replace fossil fuels when old systems are to be decommissioned and in meeting graduated fuel switching, especially in industry and transportation. Using concepts of import substitution (Bruton, 1998) and applying them to energy security would suggest that SIDS must protect their economies from the harmful dependence on imported energy, by harnessing an array of indigenous energy options to replace what they may otherwise import. The emphasis should be on increased energy self-reliance, as opposed to exclusion of imports, as energy demand and supply need to be met if development is to be continuous.

Intra-regional collaboration and effective national policies are also crucial to accelerate implementation across SIDS in a region.

Energy status of SIDS

With few exceptions, SIDS from the Caribbean to the Pacific are predominantly energy (petroleum) importers, and therefore energy insecure. Islands approaching 'sustainable energy island' status may include Faeroe Island, Denmark, with wind supplying 100 per cent of electricity, Yakushima, Japan, with more than 80 per cent of its electricity coming from RET, especially hydro (56 megawatts [MW]), Dominica with 45 per cent hydro (220MW) and Guadeloupe utilising wind (2MW) and geothermal (5MW) potentials. To lesser degrees, Dominica's hydro resources (7.6MW) provide more than 50 per cent of the total energy supplied to the national grid, and in the French overseas departments (Guadeloupe, Martinique, Réunion Island and French Guiana) 45 per cent of fuel imports are from fossil fuels, the balance from RET, including wind and hydropower.

More typical, though, is a low energy security predicated on fossil fuel imports. In CARICOM, hydrocarbons accounted for around 95 per cent of total primary energy supply, with renewables accounting for approximately 5 per cent of total primary energy supply (Detlef and Coviello, 2005; CARICOM Energy Policy, 2007). The US Virgin Islands depends on imported energy for 99 per cent of its demands, while in some Pacific islands, petroleum products accounted for almost 80 per cent of primary commercial energy consumption, while RETs – mostly hydro – contribute to less than 10 per cent of the islands' energy use (South Pacific Regional Energy Programme [SPREP], 2005). The economic costs for not using indigenous renewable energy are inflationary prices induced

by imported energy costs, and reduced price competitiveness in global markets. The social cost is stagnation in health services, education and security, as debt repayment consumes a greater portion of government national spending. The environmental challenge, meanwhile, is the failure to arrest natural resource damage induced by the transportation, storage and use of fossil fuels.

SIDS such as Jamaica and Grenada hope to improve energy security rapidly from potential oil and gas finds, while others such as Trinidad, Cuba and Barbados hope to augment their current petroleum resources through new exploration campaigns within their territories. However, these options for energy security are highly risky and expensive: prospects are assumed to be minor, and do not easily attract early investments from oil and gas companies with the requisite financial and technical resources to make such options a present reality. Although new finds should not be excluded, EE&C and RET remain the certain near-future option for SIDS. Energy security should therefore include utilising localised wind, geothermal and biomass options, proven successful for industrial, commercial and domestic uses, and petroleum for existing infrastructure. Solar and hydro will also be critical resources in meeting domestic and commercial demand.

Energy efficiency and conservation – the first line of defence

Overall, the rationale for applying EE&C initiatives is aligned to the **'Basis for Action'** of the BPOA (Annex II, Chapter VII, paragraph 36) and part of the **'new ethic of conservation and stewardship'** endorsed by the Resolution of the UN Millennium Declaration (Resolution 55/2 Paragraph 23, September 2000). Generally, energy management also reduces SIDS's exposure to increases in energy prices, an external threat to sustained development.

Energy efficiency and conservation using renewables or non-renewables is an immediate to long-term strategy for SIDS to improve their market competitiveness. As energy prices increase, there is an external opportunity for energy-efficient sectors within SIDS to maintain or increase production levels and profitability against less efficient counterparts (Wright, 2003). Efficient operations also lead to less environmental aspects and impacts, as pollution prevention and reduction techniques are successfully applied. Appropriate technologies and best practices for EE&C can often be implemented within 1–2 years, as opposed to some large-scale RET projects which may require 2–4 years from feasibility study to operation. Energy efficiency and conservation not only reduce expenditure (thus diverting monies to other key areas of national development such as education, health and social services), but also contribute to the achievement of productivity which meets international benchmarks.

Energy efficiency and conservation gains can be most dramatic for SIDS with high energy costs (e.g. the Caribbean mean average of US$0.17 per kilowatt hour [kWh]; Escalante, 2003), high industrial energy demands and vulnerabilities to oil price shocks. Recently, the European Commission (EC) announced that a new liberalised market-access regime through Economic Partnership Agreements (EPAs), including all African, Caribbean and Pacific Group of States (ACP) products, would replace the EU/ACP sugar protocol as of 1 January 2008. This means a new external threat, for some Caribbean sugar producers (an important sector with high heat and power demands) may experience a 'sudden' 37 per cent price cut, market uncertainties and heightened competition with the entry into the EU market of new lower-cost ACP producers. Applied competence in onsite cogeneration and trigeneration[10] in the sugar cane industries of SIDS could be a potential internal strength to increase overall factory efficiencies up to 80 per cent, reduce costs, provide additional income streams and, at a minimum, maintain their place in the market. Incentives for EE&C in the CARICOM cane industry alone could mean saving more than 125,000 jobs and income of

approximately US$300 million/annum. An efficient industry could continue to empower men and women (who work in the industry), combat poverty and provide young people with decent and productive jobs (UN Millennium Declaration Resolution 55/2, paragraph 20, September 2000).

The hotel industry is a major foreign exchange earner for SIDS, and also has potential for significant gains. Energy accounts for more than 70 per cent of the total utility costs at typical hotels, with equipment, appliances, air-conditioning and lighting being significant contributors (Escalante, 2003). With simple, inexpensive devices and practices, such as monitoring energy use, insulation, use of natural ventilation and lighting, occupancy sensors, compact fluorescent lamps, maintenance and insulation, hotels can reduce electricity consumption per guest per night by 10–24 per cent and up to 19 per cent of the hotel's total electricity use. These savings can occur in 18 months, with some payback periods as short as 4 months depending on the intervention. These savings extrapolated over the gamut of hotels in any one small island state redounds easily to a significant national gain.

Potential savings for industrial and commercial consumers are easily achieved through energy monitoring (10 per cent), corrective and preventive maintenance (15–20 per cent), awareness (10 per cent), reduced air infiltration into conditioned spaces (10 per cent) and energy-efficient lighting and retrofits (40 per cent) (Haughton, 2003). For utilities, savings can be made from the supply side by reducing generation and transmission losses (16 to 20 per cent in the Caribbean). The main consumers of electricity should also be targeted for special EE&C programmes – for example, the National Water Commission in Jamaica, which consumes on average 47 per cent of the government's electricity usage. At the residential level, town houses could be designed and sold with EE&C features as standard (e.g. the Doric Residential Complex in Jamaica), with homeowners standing to reap quantifiable savings.

With other sectors, such as transportation, consuming as much as a quarter of imported fossil fuels, interventions must transform cultural barriers over time. Air transportation may impact SIDS less than ground transportation, as airline fuel supplies are distributed over their various international ports of call, fuel costs are borne mainly by international carriers (except for some national and regional carriers e.g. Air Jamaica, Caribbean Airlines and Singapore Airlines) and in some SIDS the percentage consumption is relatively low (approx. 6 per cent of total in Jamaica, compared with road and rail of 24 per cent). The association of mass transport with a lower quality of life and of large engine private vehicles with the converse, plus the slow uptake on information technology (IT) competences for servicing complex computer-controlled engines, presents a challenge. In this context, attempts at improving mass transit efficiencies (e.g. fuel switching to natural gas), introducing car-pooling and vehicle fleet shifts towards electric, hybrid or flexi-fuel vehicles may be unsuccessful. Projections for improving this sector must be realistically weighed in the cultural setting, and more familiar options such as the use of biodiesel and bioethanol fuel blends may have more success for fossil fuel import substitution efforts (e.g. coconut oil use in the Pacific islands). Other measures, such as linking duties with engine size and rated fuel mileage, lower toll/road charges for utilising optimal seating capacities and congestion charges in cities, may induce EE&C practices on the part of motorists. Where possible, national airlines should purchase/lease efficient aircrafts (e.g. the Airbus A350 and Boeing 787 are said to be 15 per cent more efficient than their predecessors) and should ensure optimal bookings per flight.

Extremely important in cost savings for implementing EE&C is an 'upstream' approach, creating opportunities by incorporating EE&C designs into original building design to enhance comfort, safety and productivity. Energy Efficiency Building Codes (EEBC) (e.g. EEBC-94, finalised and approved as a voluntary standard in Jamaica with funding from the World Bank and the Canadian

International Development Agency [CIDA]) or the Leadership in Energy Efficiency Design (LEED) protocol are important tools to facilitate opportunities and rewards for the building industry and private sector entities. Such tools are said to be able to reduce energy consumption by 30–36 per cent per annum and shave electricity peak demands by 24–29 per cent, with only an initial 5 per cent increase in building cost. Another upstream approach is the creation of a demand for energy saving opportunities, with the engagement of more energy saving companies (ESCOs) and energy auditors. ESCOs, in particular, are driven by performance contracts to generate quantifiable energy or other savings for their client, the basis on which they are remunerated. Hilton hotel chains within Barbados, The Bahamas, St Lucia and Puerto Rico, have benefited from the energy management interventions of ESCOs.

Downstream energy auditing is also a valuable tool for identifying opportunities for real savings and for setting and recommending achievable EE&C targets. Such tools could be recommended for implementation throughout SIDS. Also on the downstream side, the retrofit markets can have fast uptake (e.g. CFL lamps, water savers and motion sensors), where tax and other incentives are applied and public education is dynamic (radio, TV, road shows etc.)

With the current cost of capital, competition for developmental funds and reducing the unit cost of production in the global marketplace, collaboration among regional SIDS becomes critical in order to fast-track the application of best practices in energy efficiency cost effectively. Pacific energy ministers (Communiqué, Pacific Energy Ministers, 2007) agreed and affirmed that it was necessary to share experiences, develop expertise and competencies in EE&C, collaborate in programmes, projects and standard setting, in order to eliminate duplication and accelerate implementation to reduce energy dependence on external sources. In CARICOM, member states have embraced the need to collaborate on regional energy efficiency, institutional networks, testing facilities, training and capacity building, and to develop regional public sector energy efficiency programmes. In this context, a CARICOM Charter on Energy Efficiency has also been propagated.

Island-specific initiatives such as policy, energy legislative frameworks, programmes and incentives are also needed to encourage cost-effective and energy-efficient initiatives at the national level, as recognised by the Pacific energy ministers. It was also recognised that a private sector–government partnership is needed to drive major opportunities for energy efficiency from the power companies (Communiqué, Pacific Energy Ministers, 2007). The Pacific Islands Energy for Sustainable Development (PIESD), by targeting the power utilities of 14 South Pacific ACP members, aims to decrease costs and fuel consumption and improve the efficiency of power production, transmission and distribution with a target of 30 per cent reduction in losses using supply side management (SSM) projects (Fairbaim, 2004). Within the utilities, SSM plans would be developed, appropriate cost-effective power system equipment would be identified and staff capacity building would be implemented. Within CARICOM, member states have also committed to promoting high-efficiency power generation technologies (including combined cycle and cogeneration) and observances of best practice industry standards, with the aim of reducing system losses in generation, transmission and distribution (CARICOM Energy Policy, 2007).

Status and potential for renewable energy technology use in SIDS

Globally, renewable energy investments continue to increase, amounting to more than US$38 billion in 2005.[11] For 2005, among the power generation options, installed capacity for hydro was 930 gigawatts (GW; 4 per cent growth), biomass power was 1GW (50–100 per cent growth) and grid-connected solar stood at 3.1GW (55 per cent growth). Wind capacity attained 74GW in

2006 (25 per cent growth over the previous year) (International Network for Sustainable Energy [INFORSE], 2007). Globally, biodiesel production has risen to 3.9 billion litres (a growth of 85 per cent in 2005) and bioethanol to 33 billion litres (8 per cent growth). For renewable heating and power options, geothermal resources were 28 gigawatts thermal (GWth) at the end of 2005 (a 9 per cent increase) and solar water heating achieved 23 per cent growth from 2004 to 88GWth (REN21, update 2006).

In the context of this favourable global growth rate, the potential for harnessing and proliferation of RET in island states has to be carefully examined against the background of available natural resources. Most SIDS have varied but limited endowments of renewable resources, and may not have the potential to harness more than 25–30 per cent RET towards their national energy mix. This was acknowledged in the BPOA (Annex II, Chapter VII, paragraph 37). It is important to integrate EE&C outcomes when considering RET. Otherwise they cannot be considered truly sustainable, and could be potentially as damaging to economies and the environment as those that use non-renewable resources.

Renewable energy technologies for SIDS, such as solar, biogas, biomass and wind, when implemented with EE&C considerations allow for the avoidance or removal of greenhouse gases (GHG), effluents and solid wastes during operation. During operation, fuelwood plantations supplementing sugar cane bagasse can facilitate 110 per cent carbon capture, biogas can reduce methane (a GHG) escape to the atmosphere and no emission is produced by wind. Cognisant of our global village, such applications are supportive of the spirit of the Kyoto Protocol now ratified by 175 countries, including SIDS such as St Lucia, Cook Islands, Fiji Islands and Cuba (23 October 2007). The Protocol has created a unique opportunity for project financing for SIDS via the Clean Development Mechanisms (CDM), by raising the bargaining power of SIDS (grouped or individually) in partnerships with industrialised countries needing to meet their obligations (UN Millennium Declaration Resolution 55/2, paragraph 23, September 2000).

Possibly the most prolific application of RET and a competitive strength for tropical SIDS is solar energy.[12] With declining photovoltaic (PV) module costs (approx 30–60 per cent of total system costs), at prices around US$5.50 per peak watt (Department of Business, Economic Development and Tourism [DBEDT], 2006), PV systems can be applied unrestricted for Pacific, Caribbean, African and Indian SIDS, utilising building roofs and ground spaces. The French overseas departments have already installed 3MW of PV, with a clear potential to increase output. In Hawaii, 309kW of PV has been installed on the Ford Island's Building in Oahu for the Navy, while 25 public schools have received rooftop PV systems (Oahu, Maui, Hawaii's Big Island) and 209kW was installed at the Parker Ranch. All the systems were grid tied (*Star Bulletin*, 2007; Power Technology.com, 2007),[13] in addition to several thousands that are in remote subdivisions and not serviced by the utility grid. A projection of several thousand new homes in Hawaii are to have solar panels installed over the next few years, totalling 6MW (some were installed in 2006) and a commercial 167kW-generation plant is to be installed on the roof of the Hawaiian Electronic Company's Archer Sub-station, servicing up to 200 homes (*Star Bulletin*, 2007). The ADMIRE programme[14] in Marshall Islands, targets more than 2,000 PV installations with some currently installed on Wothoo and Wodmej. These installations have already improved academic performance in schools and the productivity of fishermen and women (Global Sustainable Energy Island Initiative [GSEII], 2007). Solar PV has proved to be a solution for rural electrification challenges, where it may be expensive to extend the grid for small dispersed homes in small communities. For rural communities, PV facilitates the introduction of more modern amenities, improved security and community activities, as lighting options potentially increase productive hours and income generation, especially if electricity co-operatives are established.

Solar thermal, the most widely used RET application in the Caribbean (especially solar water heaters [SWH]), is one of the best commercial opportunities for SIDS. Barbados has developed its SWH industry, encouraging its manufacturers (e.g. Solar Dynamics, SunPower and AquaSol) distributors and retailers. More than 40,000 solar water heaters have been installed in homes, commercial businesses and hotels in Barbados. For hospitals needing large volumes of hot water and power, and where the tourism industry is significant (such as in Jamaica, Barbados, Mauritius and Seychelles) economies of scale generate the most meaningful cost savings and avoided fuel imports. Hotels and bed and breakfast accommodations, depending on size and season, may spend approximately 20–30 per cent of electricity costs on water heating (East Harbour Management Services [EHMS], 2003). Domestic payback periods may be around 3–4 years, but commercial utilisation may be 2–3 years, especially when electricity heating is replaced.

Islands with a large landmass, highly varied topography and elevations, and limited karst rocks, tend to have some hydropower resources. Cuba (57MW), Dominica (220MW), Dominica (7.6MW) and Fiji (90MW), by virtue of their topography, geology and landmass, have adequate rainfall and can utilise dams and run-of-the-river type mini-hydropower systems. The theoretical potential of these islands (e.g. Dominica 25MW, Jamaica 82MW, Fiji 400MW, Cuba 650MW, and Dominica 1,800MW) are constrained by competing social uses, ecological water demands and insufficient technical information for analysis of potential.

Larger mountainous SIDS (e.g. Jamaica), the smaller islands of the Lesser Antilles (e.g. Curacao and Bonaire) and the Windward Islands (e.g. St Lucia and St Vincent) are geographically positioned to take advantage of localised wind sources (e.g. sea and land breeze and mountain and valley winds), and those generated by prevailing trade winds blowing east to west. Others, such as Cape Verde and some Pacific Islands, are also able to utilise wind potentials. For example, Hawaii's mountainous topography and strategic location within the northern Pacific Trade Wind belt creates an excellent wind resource, and several megawatts of wind power have been installed at Kahuku, Lalamilo and South Point on Hawaii Island (Jensen, 2000). Location and topographical features are internal strengths for isolated SIDS, enabling some to bypass the disadvantage of not being able to utilise cross-border electricity export to improve energy security, due to the water barrier and distances between islands.

Geothermal is an important heat and power source for industrial applications, and therefore may be significant in displacing fossil fuel consumption (and import) for heat and power generation. Commercial and industrial geothermal potentials are restricted mainly to SIDS on volcanic ridges of an archipelago (e.g. Guadeloupe 5MW), where tectonic plates are spreading or colliding. Puna, on Hawaii Island at the edge of the Kilauea volcano, is said to have one of the most significant geothermal resources at 676°F (358°C).

Commercial biomass fuel plantations (e.g. cane, corn and sorghum for bioethanol; Jatropa and coconuts for biodiesel; trees for fuelwood) are mostly suited for larger SIDS (e.g. Mauritius, Cuba and Dominica), as dedicated crops require contiguous land space to minimise transportation costs, and to obtain economies of scale for production and maintenance costs if they are to be viable. Smaller SIDS also face dwindling land with competition from housing, landfills and demand for open spaces. Pre-existing competence in large-scale mono-crops production with power generation (e.g. sugar cane in Mauritius and Fiji), is also important in the application of biomass fuels. Also for cane, some capital infrastructural costs have been written off or reduced over years of operations, potentially reducing costs for biomass power generation. Cellulosic feedstocks (as opposed to edible crops) grown on marginal lands, with increased CO_2 sequestration and lower fertiliser costs, can increase ethanol production. In conjunction with newer conversion technologies, these cellulosic

feedstocks, such as switchgrass, miscanthus or sorghum, may yield a total of 2,000 gallons (gal) per acre (assuming 20 tons harvested per acre), while edible corns may yield about 900 gal of ethanol/acre (*The Green Chip Review*, 2007).

Biogas, though a technology that has been proved for heat and power generation, is not a significant option for the national energy mix, as centralised effluent flows are typically small and often do not justify the capital costs. Larger potentials, such as the Soapberry Wastewater project (Jamaica), will treat in excess of 20,000 imperial gallons of wastewater/day, utilising state-of-the-art biological aerobic technology (Kelly, 2006). When considering the sustainability issues of biofuels, therefore, other aspects should be taken into account, such as opportunity costs (especially for export crops), reduction of food crops and the energy needed to produce the biofuels.

Advance technologies such as Ocean Thermal Energy Conversion (OTEC), may be considered by SIDS with steep island shelves and sufficient water temperature differentials near shore. Open-cycle OTEC has been demonstrated in Cuba, and closed- and open-cycle OTEC in Hawaii (52kW and 210kW at Keahole Point). Possibly such cutting edge technologies, which have not yet been proved convincingly, could be reserved until less expensive, proved technologies have been used.

From this menu of indigenous energy resources, RET applications should be customised to fit local conditions. 'Rubber stamping' is inappropriate. The best use applications of renewable energy technologies, and those with the greatest impact over the next decade, will probably be for commercial power generation and ground transportation (biomass-cogeneration will be important if SIDS remain in the sugar cane industry). The current Caribbean Basin Initiative arrangements and regional and international fuel harmonisation trends will provide support for biofuels for transport. Domestic and commercial use of SWH could also be important, as will small amounts of PV. In the meanwhile, some SIDS are aggressively exploring their petroleum potentials to achieve greater energy security and reduce energy imports as part of a holistic and viable solution.

Barriers for implementing RET and EE&C

There are several issues that negatively affect the implementation and proliferation of RET and EE&C. For example:

- Inadequate policy support
- Absence of a dedicated and empowered champion for RET and EE&C
- Absence of appropriate financing and accounting practices
- Inadequate expertise in resource mobilisation
- Cross-sectoral issues
- Public education and public awareness
- Influence of utilities
- Competition for scarce resources
- Scale of resources

Inadequate policy support

Without an energy policy, there will be little investment in RET and EE&C. In the last 3–5 years, there has been a concerted effort to develop (or document) local renewable energy policies or energy policies that have committed sections for RET and EE. A few examples of such efforts include:

- Jamaica – revising the Jamaica Energy Sector Policy 2006 and a completed study on 'Renewable Energies Potential in Jamaica' (Detlef and Coviello, 2005)
- Cuba – Law of the Environment, with encouragement for renewable energy and an 'Energy Revolution'
- Barbados – comprehensive energy policy with recent updates

Regional efforts have produced, for example, a draft CARICOM Energy Policy (2007).

Effective energy policies promoting RET and EE&C could include some or all of the following components, where possible:

- Planning and evaluation tools, such as energy forecasting and energy balancing.
- Clear legislative and regulatory directives.
- Offering various financial incentives for RET & EE&C to all sectors, including equity with existing incentives (such as subsidies) already offered to existing users of conventional fuel. Differential taxation based on levels of energy efficiency, availability and appropriateness may also be offered.
- Contractually linked/binding specific targets for RET and EE&C applications, especially for the heat and power sectors, including cogeneration and combined cycle technologies.
- Power generation incentives, including feed-in tariffs, capital subsidies/grants/rebates, special duty and tax concessions/credits.
- Net metering and net billing options for small distributed generation applications.
- Reduced or weighted influence of utilities in bid evaluation and selection for new generation.
- Public education, including development of a trained and skilled workforce.
- Encouraging the development of market mechanisms for GHG emission reduction.
- Special financing mechanisms for all sectors, including residential users.
- Stimulation of upstream RET and EE&C demands (e.g. EEBC as a regulatory standard).
- Updated and appropriate emissions and fuel quality standards for all sectors.
- Using RET for rural electrification.
- Developing appropriate models for energy sector liberalisation, decentralisation and privatisation.
- Using full-cost accounting and benefit–cost to evaluate proposed new installations. Accounting should also consider all aspects of sustainability.

The successful effects of clear policies and political will be the proliferation of RET and EE&C nationwide, as can be seen from the Cuban and Japanese cases. The Cuban Energy Revolution (a government policy) facilitated savings of approximately US$1 billion per year from RET, including 1,000MW of wind, solar and hydro power, the increased use of energy-saving fluorescent light bulbs and low-energy household appliances. Already 7,000 solar panels have been installed, and PV modules are being manufactured and exported. Electricity prices were also revalued to better reflect the cost of production through raised and stratified tariffs pegged to consumption, thus creating a conservation incentive (James, 2007).

Japanese energy policies were developed for the country's multiple islands (432 inhabited islands of 6,852). In Miyaki, Yakushima and Hachijo-jima Islands in the early 1990s, the Enetopia Island Plan, Zero Emission Vision and Clean Energy Model Island for the 21st Century, facilitated the implementation of 1.75MW wind, 0.75MW solar PV, 56.5MW hydro and 3.3MW geothermal, plus

the importation of six electric vehicles. The Ministry of International Trade and Industry (MITI), implementing its national policy mandate through a unique quasi government entity – the New Energy and Industrial Technology Development Organization (NEDO) – utilised a rotation of private sector and public sector employees to implement a Ten Thousand Roofs Programme under 'Project Sunshine'. Components of the programme included:

- An installation grant collected through an electricity surcharge.
- Voluntary purchases of excess grid-provided electricity by the utility at the retail price of electricity.
- That businesses could apply to NEDO for a grant under a programme funded to the value of 1.12 billion yen (US$9.5 million) to subsidise the installation of new technologies.
- Tariffs linked to consumption.
- Fiscal support for residential PV systems, covering 50 per cent of the cost of PV modules, peripheral equipment, distribution lines and installation work.
- Homeowners having access to the New Energy Foundation (government) for subsidies and a grant (one-third of the purchase and installation costs) if they satisfied the requirements (e.g. having an approved grid connection). The programme budget would pay for roughly 10,000 residential installations.
- Subsidies were granted for wind power, cogeneration, waste power and other 'new energies' (dispensed by NEDO) up to one-third of the total installation cost. Local governments are eligible for comparable subsidies under a parallel programme, also administered by NEDO.

Supporting laws in both the Cuban and Japanese cases included:

- deployment of renewable technologies under the Law on Special Measures to Promote Use of New Energies (New Energy Law) 1997 for promoting wind, solar, ocean, hydro, geothermal and waste energy, and
- energy efficiency (Law Concerning the Rational Use of Energy), which promoted energy conservation, as well as tax incentives for energy efficient equipment and public education.

Absence of a dedicated and empowered champion for RET and EE

The strategy of an 'Internal Catalyst'[15] (internal to the sovereign state) is a proved means to achieve policy targets for RET and EE&C and sustainable consumption and production targets. Without a sustained (long-term, more than 10 years) agency 'genetically linked' to the governments of SIDS to drive the objectives, neither a surge in implementation nor a cultural shift will be achieved. Commitment and dedication must be **endogenous** factors for sustainability. On one hand, the private sector grapples with some inherent conflicts of profit objectives versus satisfying environmental and social responsibility. On the other hand, central governments are driven towards development of social, environmental and political agendas against the background of limited economic resources. Non-governmental organisations (NGOs) and civil society, meanwhile, have neither sufficient policy legislative influence nor the funding to achieve a sustained outcome. The profile of the champion or internal catalyst is therefore a hybrid with government origins, given private sector decision-making power and financing and the liberty to lobby for civil society. This internal catalyst must have a clear transforming vision to catalyse sustainable consumption and production imperatives.

In Jamaica's case, the champion was the Petroleum Corporation of Jamaica (PCJ), in Japan it was NEDO and in the French overseas departments it was ADEME.[16] The PCJ has the mandate in

law for implementing Jamaica's national energy policy; it owns the nation's petroleum refinery (Petrojam Ltd) and petroleum marketing subsidiary (Petcom) (both competing with private sector entities). It is also the regulator of the current campaigns for oil and gas exploration. It lobbies for a reduction in Jamaica's high-energy intensity, improvements in energy security and utilisation of supply- and demand-side management techniques to increase energy self-reliance. PCJ's achievements are as follows:

- implemented Wigton Wind Farms (the Caribbean region's largest wind farm, with 23 wind turbines, each producing 900kW),
- implemented energy-efficiency and conservation programmes in government hospitals, including full-scale energy audits (US$93,000, from UNDP funding), installed 3kW of PV (utilising government and UNDP funding) and designed efficient air conditioning and lighting systems and rehabilitated SWH systems (costing US$14,000),
- established a National Energy Efficiency Fund (US$10,000, with Inter-American Development Bank [IADB] assistance),
- implemented capacity-building programmes for secondary, tertiary and professional education levels,
- revised the Jamaica Energy Sector Policy, incorporating RET and EE&C components,
- through Petrojam, produced 40 million gallons/year of fuel-grade ethanol and ran an ethanol in gasoline trial as part of a plan to replace Methyl Tertiary Butyl Ether (MTBE),
- commissioned 500 solar water heaters in residential complexes and more than 77 solar street lights island-wide,
- donated more than 2,200 compact fluorescent lamps (CFLs) to government entities, and in a joint programme with the Government of Cuba donated approximately 4 million bulbs island-wide, and
- implemented 13 ha of fuel wood plantation and nursery.

The RET and EE&C champion for the French overseas departments is ADEME, a public agency under three ministries, committed to energy, research and the environment. It collaborates closely with public sector partners on research and industry, the European Commission for market incentives and various councils for local implementation. Under this structure, ADEME has had successful interventions in EE&C, GHG abatement and development of RET, with legal obligations in place to meet energy-efficiency targets using 'White Certificates'. Under the Energy Law 2000, there were guarantees for purchases and feed-in tariffs for projects (amounting to more than 12MW). Market incentives and subsidies include PV subsidies up to 80 per cent of investment costs, and income tax reductions of 40 per cent for purchases, up to 40 per cent for investment in domestic SWH systems and up to 60 per cent for larger collective systems. Biogas and biofuels subsidies can be obtained for 20 to 30 per cent of investment costs and competitive calls for tender on power generation from offshore wind, biomass and biogas electricity.

Where there is no internal catalyst or champion for RET and EE&C, such successes are not likely to occur or be sustained.

Absence of appropriate financing and accounting practices

The cost of renewable energy technologies cannot be measured truthfully by monetised values alone, but must also incorporate the emergent negative and positive externalities. Whereas the capital outlay for RET options may be considered more expensive than for traditional fossil fuels,

full-cost accounting methods (considering associated fuel generation, transport, storage, use and disposal issues) show that renewables are as competitive over the full life cycle of the fuel. Triple bottom line and benefit–cost analysis are now showing that real power generation costs, (considering externalities, embedded subsidies and life-cycle costs) demonstrate an equitable economic basis for selecting renewable fuels as viable options. Care must be applied to avoid seemingly financially viable experimental RET and EE&C projects, which later need to be either subsidised or have fossil fuels used to augment fuel supplies. Green funding, third-party financing and other financial mechanisms for renewables should be considered equitable and valid commercial mechanisms compared with the more than 4 billion Canadian dollar (C$) subsidy to the Canadian oil and gas industry,[17] and annual subsidies and other external costs of more than US$1 trillion related to the upstream and downstream gasoline life cycle in the USA.[18] In this context, Jamaica's 20.7MW wind farm receiving a grant of US$7 million to achieve 5.6 cents/kWh plus an estimated income of US$3.1 million between 2004 and 2012 for Certified Emissions Reductions (CERs), is competitive on equitable terms with a fossil option. Interestingly, the typical threshold of 5–7 cents/kWh for acceptance of some power generation projects using fossil fuels does not reflect the electricity prices of 20–35 cents/kWh experienced in many SIDS.

Biomass using fuel cane, bagasse cogeneration and bioethanol production will be critical for improving the US$300 million earnings and saving 125,000 jobs in the cane industry in CARICOM. Currently in Jamaica, wet ethanol is imported for the production and export of 100 million gallons of fuel-grade anhydrous bioethanol (60 million gallons from Jamaica Broilers Group Ltd – a private sector agro-industry). Local production of feedstock is the route to optimise social and economic gains. Prices are increasing from 85 cents/gallon in Brazil to US$1.9/gallon in the USA and US$2.8/gallon in Hawaii (with production incentives and tax credits equal to about 4 cents/gallon),[19] making bioethanol more lucrative as a fuel.

In this context, special low-cost loan facilities should be made for RET and EE&C applications, which recognise the cost savings in externalities, import substitution, potential for economic gains such as with CERs, and employment benefits. Energy saving companies (ESCOs) could also be utilised to create value-added linkages between improved efficiencies and investment dollars. The French overseas departments have utilised innovative fiscal incentives to proliferate wind and solar technologies. Long-term domestic loan facilities could be made available to residential users (e.g. in Jamaica, the National Housing Trust [quasi-government] and Victoria Mutual Building Society [private sector] offer low-interest, long-term loans for solar water heating [SWH]). As a tool to encourage serious EE&C applications, banks could consider energy audits before granting loans to business operations (e.g. in Barbados). Government fiscal support to local industries could also include concessions, duty-free import of SWH materials and partial- or full-tax deductions to consumers for the cost of the heaters (UNDESA, 2005). Barbados has now become the largest CARICOM producer of SWH, and in terms of number of installed units per capita (1 unit per 18 households). Energy funds on a revolving basis can assist in providing capacity building in energy efficiency technologies, support small-sized projects and drive market development. Special financiers such as E+Co can provide equity, loans, security and lines of credit from start-up through to implementation of RET and EE&C projects. Funds are available to ESCOs, financiers and end-users.

Whereas SIDS are often funded from external sources, we need to ensure that national priorities/drivers have sufficient weighting for selecting projects and fiscal incentives. The agreements of the Caribbean Single Market and Economy, growing support for PetroCaribe (a petroleum arrangement with Venezuela) and a suspension of the Common External Tariff in the Caribbean region, are

opportunities to explore the concept of bundling of CDM projects to attain critical CER mass to enter the commodities market.

Some regional funding options may potentially reduce energy security. Currently, Jamaica has three major petroleum arrangements with Venezuela: the Caracas Accord, PetroCaribe and a refinery upgrade programme, in which the Venezuelan company Petróleos de Venezuela S A (PDVSA) is a significant shareholder. A fourth arrangement may emerge in the form of a proposal for supply of liquefied natural gas (LNG). This means that Jamaica could stabilise its energy needs in the near future and have some economic gains; however, it would have to become significantly dependent on one source.

Inadequate expertise for resource mobilisation

In the case of funding from the European Union of 200 million euro through the EU Energy Initiative, it was reported that the process for application was so complex for SIDS that only 10 per cent were able to apply, and that the countries that applied had to have European consultancies (GSEII, 2007). Available funding that does not have simplified procedures for proposal preparation or special assistance as part of the funding offer, presents a barrier to the proliferation of RET. Capacity building is also needed to develop engineering designs and modelling for project proposals, feasibility studies and business plans that are specifically suited for the peculiarities of SIDS.

Historically, SIDS's economies used to be managed on an expense budget as the offshore interests of empires, instead of on a zero budget basis, and this may have reduced innovativeness to source funds. Many SIDS are trailing behind European and North American states in terms of their resource mobilisation abilities. On the other hand, some SIDS have developed the competence and expertise to access CDM financing for projects. Sustainable Energy Limited (SEL) negotiated CER carbon credits with the Netherlands-based ABN-Ambro for its Wainikasou and Vaturu hydro projects in Fiji. Jamaica's Wigton Wind Farms obtained a Oret/Miliev grant from the Dutch government under the Dutch Development and Environment Related Export Transactions Programme. Where experience has been gained, countries should make their expertise available to other SIDS,, as a benevolent gesture but also to attract further funding to their regions by developing a positive investment climate for developed and industrial nations seeking locations for projects.

Cross-sectoral issues

Traditionally, synergies were not created between different sectors that generated and those that consumed energy. As a result, industries often had main income streams which were isolated from other income streams across sectors, and the countries were unable to maximise the benefits of cumulative production. For example, the sugar cane industry could be used to produce ethanol and cogeneration power to be consumed by the power, spirits and transportation sectors, so creating employment in each sector. Similarly, waste disposal in landfills could be transformed into sources for energy. New technology has now made it possible to produce ethanol from cellulosic wood mass in a second-generation biomass-to-liquids technology, thereby utilising waste biomass from forestry, agricultural processes and/or the furniture industry (James, 2007). The production of biodiesel (using Jatropa curca) in Dominica or the more than 100,000 gallons of coconut-based biodiesel from the Tobolar coconut industry (GSEII, 2007) can provide a much-needed transportation fuel. This would reduce the volume of imported diesel fuel, reduce sulphur emissions (providing environmental benefits), while at the same time presenting employment opportunities in agriculture, processing and export. Hydropower can provide for irrigation, domestic

water and power (e.g. the proposed Blue Mountain Multipurpose Scheme – Water for the Kingston Metropolitan Area [KMA], 20MW and irrigation).

Public education and public awareness

When consumers are unaware of measurable benefits, they will continue to follow familiar customs and habits. Therefore, the end-user must understand the specific and general benefits of RET and EE&C, and where possible receive measurable gains. With the hotel industry example (see above), staff awareness of the EE&C technologies and practices was sufficient to generate a 10 per cent saving in energy costs. Critical too is the fact that shareholders of companies in SIDS may not be as aware or sensitive to environmental or EE&C matters as their European lobbyists and shareholders are. Corporate bodies have therefore continued to make key decisions based on financial criteria, and annual reports and audits are often devoid of environmental or social reporting. National decision-makers must therefore continuously inform their publics about opportunities and benefits for using RET and EE&C for a number of reasons:

- The shift to RET and EE&C is a cultural one in many cases. Cultural shifts may occur in the short term, but for it to be sustained, behaviour must be reinforced continuously.
- Advantages gained for conventional fuels (lowered prices or the addition of new fuels to the energy mix, such as natural gas) may cause a de-emphasis on renewables and EE&C. If these advantages are lost, then it is often difficult to regain the momentum regarding EE&C and the benefits of using indigenous energy sources.
- Younger generations emerge providing a window of opportunity to create a sustainable cultural pattern.
- Technologies are changing rapidly and the benefits should be grasped to maximise on new opportunities.
- Much investment has been sunk in existing fossil technologies. However, on expiration of the useful life of equipment, opportunities will emerge for new investments. Local and foreign investors should have appropriate knowledge to make the decision that yields the most optimal results (taking the social, economic and environmental benefits in account).

Public education should include a range of informal to formal educational options (e.g. workshops, academic programmes) suitable to targeted audiences in a manner that is culturally acceptable. Education should deliver information, and also develop competence for sustainability (e.g. programmes that are focused on regional institutions).

Influence of utilities

Another barrier faced by RET for power generation applications is the influence of power generation and transmission companies. Whereas there have been various degrees of privatisation, unbundling of monopolies and deregulation of the power sector in many SIDS, utilities continue to have licences for large blocks of electricity supply and usually all of transmission. This is often a default position, where some SIDS's total power demand is not sufficient to make generation commercially viable for multiples of generators and dividing transmission would be unwieldy to manage. This exerts an unusual influence on regulators and energy ministries to provide special considerations to technical and fuel preferences of the operators over large blocks of generation using 'familiar' conventional fuel technologies. In some cases, the utility company is a deciding member of bodies selecting new generation proposals. Energy efficiency may be seen by some to be contrary to the core business of energy supply, and often EE&C are valuable only in periods when expansion is not

economically feasible and buffer capacity is approaching critical lows. While recognising the limits for competition in SIDS, it is also important that government interventions and mandates lead the way for national benefits, with the utilities acting in a supportive role.

Competition for scarce resources

The demand for renewable fuel sources often competes with other social, economic or environmental demands, and may naturally limit which RET which can be implemented. The diffused nature of the renewable energy sources (such as solar and wind), as compared with the more energy-dense fossil fuels, also means that RETs typically need to concentrate the energy source (using large volumes of water, hectares of space or multiples of turbines) before they can be applied in commercial settings. The competition for resources is therefore often heightened, meaning that sometimes conventional, energy-dense fuels are selected over RETs. For example, hydropower considerations must now reserve 'environmental' and 'social' water demands (i.e. minimum volume flows needed to maintain healthy ecosystem functions, social use or recreational benefits) as stipulated by water resources management agencies. This can affect economic viability projections. Biomass plantations may compete with high-valued crops for land, and wind farm sites may compete with aesthetic features, especially if coastal.

Scale of resources

With SIDS's small populations, limited land space and limited surface water, often the resources that are available for renewable options are small compared with those of industrialised nations. For centralised power generation, utilising waste-to-energy (WTE) technologies and others, the small populations consuming power and producing wastes may not have the economies of scale to make investment attractive. Numerous feasibility assessments of the potential for using Jamaica's 900,000 tonnes of waste each year have determined this to be too small to fuel a commercially attractive power generator system. Technologically advanced smaller modular systems can now utilise as little as 250,000 tons per year at an investment of US$1,967 per kW to warrant WTE power generation.

Other

Finally in the considerations for utilising RET and EE&C, the gains should be considered in terms of the national benefits. For example, solar water heater incentives in Barbados facilitated the avoidance of fossil fuel imports of 33,000 tonnes of fuel/year, a saving of about US$6.5 million (assuming a price of US$25/bbl of oil and population of 260,000). For the English-speaking Caribbean, this would be a saving of US$125 million/year (assuming a population of 5 million) (INFORSE, 2007). A SWH of 100 litres has the capability of preventing emission of 1.5 tonnes of carbon dioxide/year, and 1,000 such units can shave 1MW of peak loading. The Wigton Wind Farm, meanwhile, is estimated to save 52,540 metric tonnes CO_2 equivalent per annum. The local environment and utilities (both private and public) would benefit from differed installation of additional peak load capacity, where RET are used.

Conclusion

Various regional and international accords have captured the challenges and plights of SIDS, and have also provided useful frameworks for sustained development. To sufficiently fast-track the development of SIDS to the level of equitable partners on a global platform – increasing wealth,

improving the quality of life and sustaining vulnerable environments, while avoiding development mistakes of the past – SIDS must be selective in strategies that move them towards energy security and independence. Full appraisal and development of local resources is paramount, to gradually replace imported energy used for long-term investments in heat, light and power generation. An emphasis could be placed on valuable local sectors that can experience transformation in the short term, for the preservation of key economic earners, cultural heritage and environments. Energy options that facilitate early shifts in national energy mix towards dependence on sustainable indigenous energy resources should also be pursued with alacrity.

The 'litmus test' of energy efficiency should be applied to energy options that could be administered within a paradigm shift towards achieving, and subsequently raising, the benchmark for energy use. Energy efficiency therefore becomes the first criteria for successfully reducing the energy appetite of SIDS, so as to achieve optimal gains from any energy security advances gained.

The endowments of renewable energy options are diverse, in spite of possible limitations for use depending on surface and subsurface features of the environment, geographic location and resource mobilisation opportunities. The optimal combination and proportion in the energy mix for a particular sovereign state is best identified after rigorous economic, social and environmental considerations are applied, and after conventional options are compared on the same platform considering externalities, social, economic and environmental impacts. Tested and approved appropriate technologies should be a priority relative to new and future-edge trial technologies, to avoid expenditure of time and funds on unsuccessful attempts.

After the long-standing use of conventional energy resources, full-cost accounting methods and access to special project funding are considered to be critical for levelling the conditions for application of EE&C and RET in SIDS. Building competences for resource mobilisation and project development will be important in this effort, and collaboration between experienced nations and their neighbours will accelerate this transition.

National policies should be so crafted and communicated to achieve these ends, with support from regional policies to encourage means of collaboration and support between sovereign states within a region, to achieve their transformational targets. Strategic buy-in by corporate 'citizens', special interest groups and the population at large becomes important for successful change, and so is an important part of the state communication process. Without a dedicated and empowered champion for RET and EE&C, efforts towards transformation may be weak and diffused at best, or costly and unsuccessful. However, there may be sufficient examples within Caribbean, Asian, Pacific and other SIDS to facilitate transformation within each. Awareness and knowledge has grown among SIDS; however, various methods for informing the public and decision-makers should be continuous, deliberately designed, implemented and sustained for a transforming and lasting impact.

Distinct internal strengths for SIDS to develop RET-based project initiatives that can attract special funding include location, geology, even climates and the global efforts to reduce GHG. However, the historical barriers discussed above, and limited resources such as land and water, have proved to be a challenge for most SIDS to overcome. Despite this, clear policy directives and planning tools can lead to the necessary solutions. In the near future, some SIDS will have to decide if their cane industry can survive under favourable market terms with bioethanol and cogeneration as sweeteners; others will attempt to make biofuels and cogeneration the determining factor.

The future for the sustainable development of SIDS using RET and EE&C as platforms is favourable, but will require clear vision, early action and a tenacious determination to succeed.

References

Barrett, David (2002) 'Catalyst Model for Sustainable Consumption and Production'. Sustainable Consumption and Production Conference, Costa Rica, 2002: Second International Experts Meeting on Sustainable Consumption and Production in Latin American Countries.

Bruton, Henry J (1998) 'A Reconsideration of Import Substitution'. *Journal of Economic Literature* Vol. XXXVI (June 1998) pp. 903–936.

CARICOM (2007) CARICOM Energy Policy, January 2007.

Centre for Renewable Energy and Sustainable Technology (2006) Renewable Energy Policy Outside the United States Part 6: Japan – The World's Most Efficient Economy 2006. Available at: www.crest.org/repp_pubs/articles/issuebr14/06japan.html.

De Boer, Yvo (2007) Second Public Hearing of the Temporary Committee on Climate Change (CLIM), European Parliament, Brussels, 4 October 2007. Address by Executive Secretary, United Nations Framework Convention on Climate Change (UNFCCC).

DBEDT (2006) Photovoltaic Electricity in Hawaii. Department of Business, Economic Development and Tourism Strategic Industries Division (DBEDT), Hawaii.

Detlef, Loy, and Coviello, Manlio F (2005) Renewable energies potential in Jamaica. Eschborn: UN ECLAC, Chile and the German Agency for Technical Cooperation (GTZ).

East Harbour Management Services (2003) The Potential for Use of Solar Water Heaters in Motels. Report to the Energy Efficiency Conservation Authority. Wellington, New Zealand: EHMS, June 2003.

Energy Publisher (Enerpub) (2007) Caribbean Energy Profile. Available at: http//:www.energypublishers.com/articles.asp?id=10914. 9/27/2007 [last accessed 4 July 2010]

Environmental Audits for Sustainable Tourism (EAST) (2004). Available at: http://www.pi.energy.gov/documents/EWSLjamaica.pdf [last accessed August 2010].

Escalante, Andre (2003) The Role of the Energy Service Company – Caribbean Region. Seminar on Implementing Energy Efficiency Projects in the Caribbean. Jamaica: E+Co, PCJ, USAID, EAST, November 2003.

Fairbaim, Paul (2004) Pacific Energy Partnership Initiative: 'Pacific Islands Energy for Sustainable Development (PIESD)'. Newsletter 1, April 2004. Fiji: South Pacific Applied Geosciences Commission (SOPAC) Secretariat.

Forum for Energy and Development (1999) *Proceedings from the Global Conference on Renewable Energy Islands*. Aero, Denmark, November 1999.

Global Sustainable Energy Islands Initiative (GSEII), GSEII Newsletter, Spring 2007. Washington, DC: Climate Institute.

Green Chip Review (2007) Available at: http://www.greenchips.com [last accessed 4 July 2010]

Haughton, Eaton (2003) 'Energy Conservation for Jamaican Industrial, Commercial and Health Facilities. Proven Energy Conservation Measures That Save $$$'. Seminar on Implementing Energy Efficiency Projects in the Caribbean. Jamaica: E+Co, PCJ, USAID, EAST, November 2003.

International Network for Sustainable Energy (INFORSE) (2007) *Sustainable Energy News* (SEN56). Newsletter for INFORSE International Network for Sustainable Energy, No.56, April 2007.

James, Canute (2007) *Energy Economist*. Issue 304, February 2007.

Jensen, T L (2000) *Renewable Energy on Small Islands* (2nd ed.). Forum for Energy and Development.

Kelly, Peter (2006) Soapberry Wastewater Project to Save Kingston Harbour. Jamaica Information Service, 19 September 2006.

Leavai, Peniamina Doug (2003) 'Renewable Energy: A Renewed Approach to Sustainable Development – A Natural Source of Empowerment for the Pacific Islands'. In *Proceedings of the 2002 National Environment Forum*, No. 4, Samoan Environment Forum, pp. 37–42.

Pacific Energy Ministers Meeting (PEEM), Cook Islands, April 2007, Communiqué.

REN21 (2006) Update Renewables, 2005 Global Status Report. Renewable Energy Policy Network for the 21st Century. France: REN21 Secretariat.

Report of the Expert Meeting on Capacity Building for Renewable Energy and Energy Efficiency in Small Island Developing States, Matavai Resort, Niue, July 2003, in *Developing and Energy Agenda for SIDS*.

Schneider, Bradley, and South, David W (2007) Landfill Capacity Solution – Converting Waste to Energy. Platts 7th Annual Energy Caribbean Energy Conference, 2007.

Sopoaga, His Excellency Ambassador Enele S, Permanent Representative of Tuvalu to the United Nations, Vice Chairman of the Alliance of Small Island States (undated) 'The Small Island States: The Challenge of Energy'. *New Academy Review*. Climate Change Edition.

South Pacific Regional Energy Programme [SPREP] (2005) Pacific Islands Renewable Energy Project. Available at: http://www.sprep.org/climate_change/documents/DemoProjectstoshowcasethebusinessangle_000.pdf [last accessed August 2010].

Standard Bank Energy (2005) *Energy 2005: Annual Review and 2006 Outlook*. South Africa: Standard Bank.

Star Bulletin (2007) Vol. 12, Issue 151, Thursday 31 May 2007.

United Nations (2000) Millennium Development Goal (MDG) 8: Develop a Global Partnership for Development. Available at: http://www.unmillenniumproject.org/goals/gti.htm#goal8 [last accessed August 2010].

United Nations (2005) Draft Mauritius Strategy for the Further Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States. International Meeting to Review the Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States. Port Louis, Mauritius, 10–14 January 2005.A/CONF.207/CRP.7

United Nations (2006) Millennium Development Goals Report. New York: UN.

United Nations Department of Economic and Social Affairs (2005) Second International Experts Meeting on the 10-year Framework of Programmes for Sustainable Consumption and Production, San Jose, Costa Rica, 5–8 September 2005. Summary of Co-chairs.

United States Department of Energy (2010) Assumptions to the annual energy outlook 2010. Available at: http://www.eia.doe.gov/oiaf/aeo/assumption/petroleum.html [last accessed August 2010].

United Nations Framework Convention on Climate Change (2006) Project 0089: Vaturu and Wainikasou Hydro Projects. Available at: http://cdm.unfccc.int/Projects/DB/TUEV-SUED1124483924.62 [last accessed August 2010].

United Nations General Assembly (1994) Report of the Global Conference on the Sustainable Development of Small Island Developing States, Bridgetown, Barbados, 25 April–6 May 1994. United Nations General Assembly A/CONF.167/9. Barbados Programme of Action (BPOA).

United Nations General Assembly (2000) United Nations Millennium Declaration, Resolution adopted by the General Assembly, Fifty-fifth session. Agenda item 60 *(b)* Distr.: General 18 September 2000, A/RES/55/2.

United Nations General Assembly (2001) Road map towards the implementation of the United Nations Millennium Declaration Report of the Secretary-General. Fifty-sixth session, 6 September 2001. Item 40 of the provisional agenda*. Distr.: General. A/56/326.

United Nations Development Programme (UNDP) (2004) United Nations Department of Economic and Social Affairs (UNDESA) and the World Energy Council, World Energy Assessment Overview: 2004 Update. New York: United Nations Publications.

Wright, Raymond M (2003) 'Energy Efficiency – With Particular Reference to Island Economies Such As Jamaica'. Seminar on implementing Energy Efficiency Projects in the Caribbean. Jamaica: E+Co, PCJ, USAID, EAST, November 2003.

Wright, Raymond (2006) 'Alternative and Renewable Energy – How Far Can the Caribbean Go?' IBC Conference, Port of Spain, Trinidad, 4–5 December 2006.

Notes

1. Energy security: the appropriate blend of energy forms, in adequate quantities, at affordable competitive costs, in a timely manner, meeting quality and functionality requirements from a strategic blend of suppliers (supply buffer). More recently the dimension of reducing acceptable or irreversible environmental impacts over the long term has been added to address sustainable development requirements.
2. Road Map Towards The Implementation Of the United Nations Millennium Declaration Report of the Secretary-General.
3. International Energy Agency. Oil reports available at: http://omrpublic.iea.org/omrarchive/13jul10sup.pdf and http://omrpublic.iea.org/omrarchive/13jul10dem.pdf [last accessed August 2010].
4. Colin Campbell indicated that an Oil Peak would be evidenced 2006–2015.
5. OPEC – Organisation of Petroleum Exporting Countries.
6. Source: graph from *Energy Economics Newsletter*, 2007.
7. *Energy Economics Newsletter,* available at: http://www.wtrg.com/index.html#Crude [last accessed 4 July 2010]
8. Renewable energy: an energy source which is not depleted after its use or which may be replenished at an equal or faster rate than its consumption.
9. Energy efficiency: increasing or maintaining the overall output of an activity while reducing or sustaining the required energy input over time. Conservation: reduction or avoidance of energy loss or wastage in the generation of an output.
10. Cogeneration is the simultaneous production, usually of heat and power, from a single energy input; trigeneration is similar, with heat, mechanical and power being the outputs.
11. REN21 – 2006 Update, Renewables Global Status Report.
12. Experts Meeting on Capacity Building for Renewable Energy and EE in SIDS, Matavai Resort, Niue, 2003.
13. See also Hawaii Small-Scale Energy Projects, HI, USA: http://www.power-technology.com/projects/hawaii [last accessed August 2010].
14. ADMIRE – Actions for the Development of Marshall Island Renewable Energy.
15. David Barrett, Sustainable Consumption and Production Conference, Costa Rica 2002. 2nd International Experts Meeting on Sustainable Consumption & Production in LAC 'Catalyst Model for Sustainable Consumption & Production'.
16. Agence de l'environnement et de la maîtrise de l'énergie (French Agency for Environment and Energy Management).
17. See for example The Pembina Institute (2005) *Government Spending on Canada's Oil and Gas Industry: Undermining Canada's Kyoto Commitment*.
18. See for example report by the International Center for Technology Assessment (CTA) (1998) 'The Real Price of Gasoline'. Washington, DC.
19. William Maloney, Pacific West Energy LLC, 2006.

Deirdre Shurland

Chapter 8

Sustainable Tourism Development Principles in Small Island Developing States

Introduction

Globally, the travel and tourism economy generates nearly US$6 billion dollars in economic activity, accounting for a tenth of global GDP. It contributes 8.4 per cent to global employment (238 million jobs)[1] and is projected to grow at an average of 4 per cent over the next decade. According to the World Travel and Tourism Council (WTTC)[2]:

> *Travel and tourism – encompassing transport, accommodation, catering, recreation and services for visitors – is one of the world's highest priority industries and employers.*

Even though the industry has contracted slightly over the past year (2007), mainly due to high energy and food prices and a weakened US dollar and economy, the travelling public has surged to 898 million globally.[3] New destinations are opening up and offering competitive adventures and experiences in regions such as Asia and the Middle East, which have posted the highest arrival growth rates. Rising per capita incomes and the operation of competitive low-cost airlines have also contributed to this increase.

The global travel and tourism economy has outpaced all other sectors in terms of growth and opportunity, and this has provided a robust incentive for continued investment in new infrastructure and facilities. China is particularly significant as it alone is expected to contribute 100 million travellers.[4] All indications are that in spite of a downturn in the global economy beginning in 2008 due to the global financial crisis, the travel and tourism industry is robust enough to withstand these pressures over the next decade. Depending upon the sophistication of the industry in terms of the solidity of its linkages and supply chains, some destinations are likely to recover more quickly than others.

In spite of its successes, tourism has been associated with high levels of land degradation, solid waste generation, land-based sources of pollution (e.g. wastewater) in aquatic and marine areas, and unsustainable consumption of freshwater and energy resources, among other environmental problems. As an industry, it often competes for prime real estate and juxtaposes visitors with different cultural practices and values to host communities, with consequent negative influences.

The SIDS network comprises 51 mainly small island states spread across three main regions – the Caribbean, the Pacific and the Atlantic, Indian Ocean, Mediterranean and South China Seas (AIMS) (figure 8.1). Their economies and progress in development have been the subject of intense scrutiny, as a result of limitations in topographic character; vulnerability to natural disasters, climate changes and related impacts; threats to biological diversity, especially in coastal and marine areas; consumption of scarce natural resources; declining traditional productive sectors; poverty; and their reliance on the travel and tourism industry for economic performance. Given the importance

of tourism to many SIDS, the sustainable planning, development, operation and management of their tourism industries are of prime importance and the subject of this chapter.

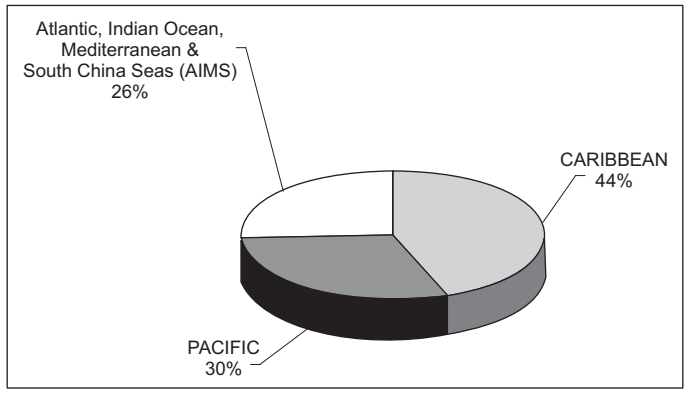

Figure 8.1 SIDS by geographic region

A comparative view of Small Island Developing States (SIDS)[5]

Most SIDS are small island nations in the Caribbean (44 per cent), Pacific (30 per cent) and AIMS regions (26 per cent). SIDS demonstrate much similarity in terms of their relative island size (figure 8.2), with three-quarters of all SIDS less than 25,000 km^2 in area. Large island nations comprising Papua New Guinea, Cuba, Hispaniola (Haiti and the Dominican Republic), Guinea Bissau and those located in Central/South America (Suriname, Guyana, Belize) make up the SIDS grouping with geographic areas in excess of 25,000 km^2.

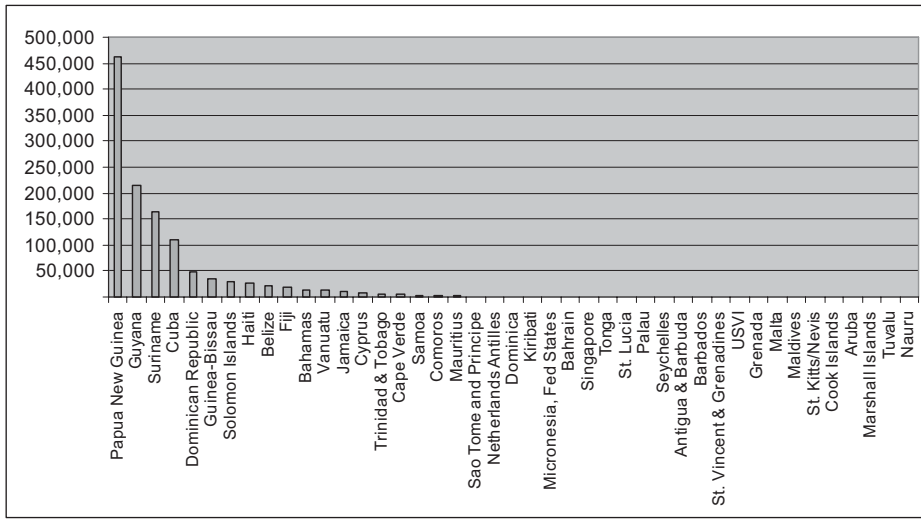

Figure 8.2 SIDS by size of geographic area

SIDS are not all uniform in terms of their economic development. There is significant variability in GDP per capita, as indicated in figure 8.3, with many of the more developed tourist economies such as Aruba, Singapore, US Virgin Islands (USVI) and the Bahamas, showing higher levels of prosperity.

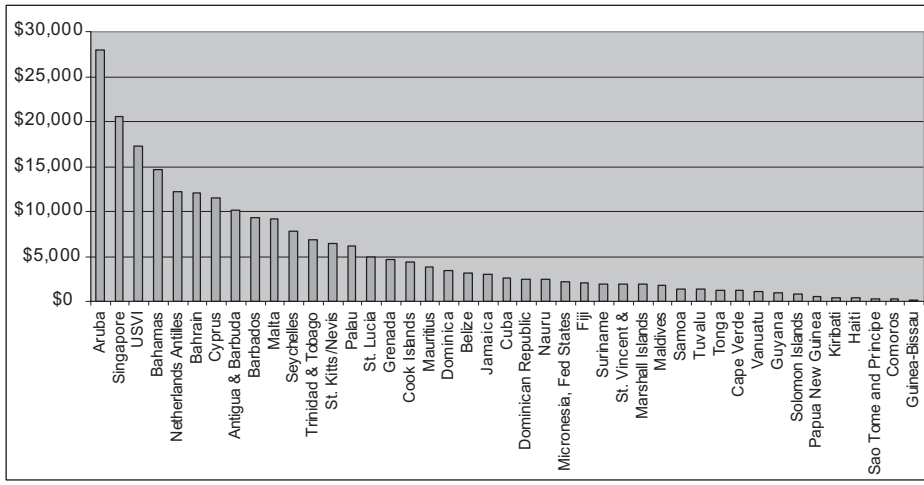

Figure 8.3 SIDS GDP per capita (US$)

Caribbean SIDS tend to enjoy higher standards of living (e.g. Aruba, The Bahamas, USVI and Antigua and Barbuda).

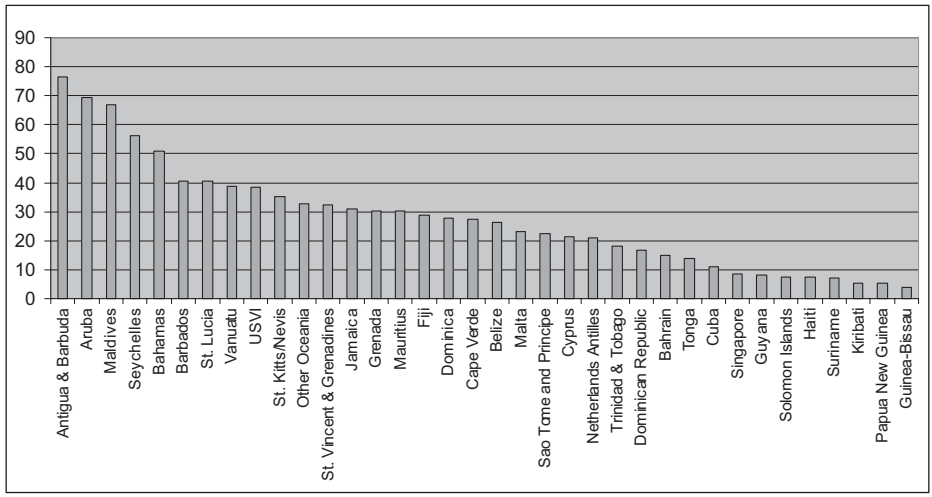

Figure 8.4 SIDS: tourism contribution to GDP (%)

Figure 8.4 compares SIDS' tourism contribution to GDP. The Caribbean is the most tourism-dependent region in the world, with Antigua/Barbuda and Aruba topping the list. On the other end of the scale, the least tourism-dependent countries are Guinea Bissau and Papua New Guinea.

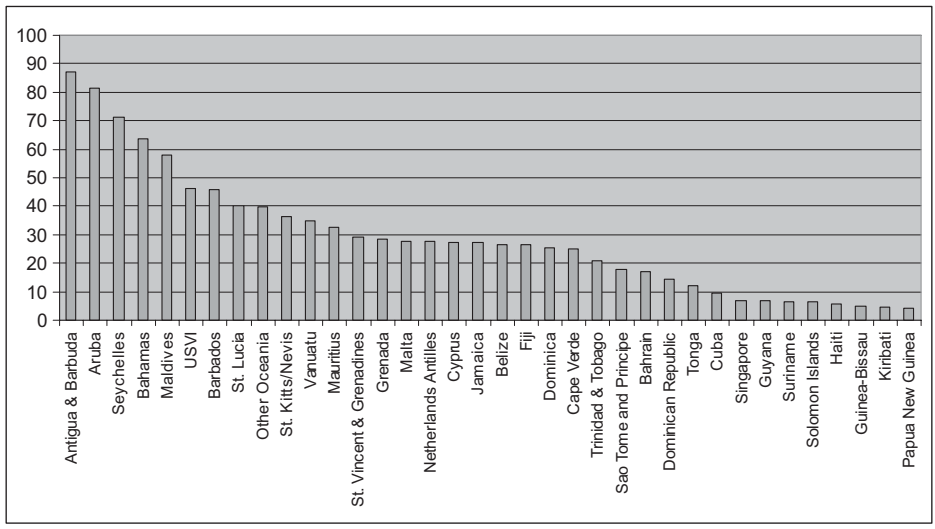

Figure 8.5 SIDS: tourism contribution to employment

A similar picture emerges (figure 8.5) with the contribution of tourism to employment among SIDS. The Antigua and Barbuda and Aruba tourism industries in the Caribbean provide the most employment (more than 80 per cent). In all, one-third of all SIDS have tourism industries that account for at least 40 per cent of GDP and total employment.

With tourism continuing to emerge as a major economic strategy for many SIDS, the challenge is exactly how should their tourism strategies be developed and implemented, at what scales and cost, and for whose benefit?

The business of tourism

The business of tourism involves far more than the inside of a comfortable hotel room. Its core product is an unforgettable experience at the selected destination that attracts the curiosity of a new visitor and maintains the fidelity of repeat guests. It involves an intricate network of products and services, infrastructure, players within the private, public and community sectors, markets, promotions, tour packages and services. Commentators typically refer to the business of tourism as an 'industry', an 'economy' or a 'sector'. References to the first two ascribe a level of maturity, integration and penetration of services that contribute to exports, national accounts and the development of the country, while the 'sector' reference infers a nascent industry competing for allocated resources with other productive sectors.

The 'destination' is at the heart of the business of tourism. These may be countries, islands or specific regions or towns within both. A destination's endowment of natural or cultural assets – e.g. beaches, valued ecosystems, scenic land- and seascapes, heritage, food, festivals and/or people – is the primary reason that visitors arrive. The Caribbean, for example, is renowned for its rhythms and azure seas; the Pacific and Indian Ocean countries for their mystical islands in a vast expanse of ocean; and Mediterranean islands for their unique blend of mythical climate and culture. These regions also possess relics of centuries past, whether archaeological, architectural or related to indigenous lifestyles; all are distinct and attractive to the discerning visitor.

As the most obvious icon of the tourism destination, the hotel may be small or large scale, part of an international chain or indigenously owned. It is the accommodation of choice for most visitors to a destination. Guests are promised safety, security, a 'home-away-from-home' and receive the expected level of comfort, service and experience for the advertised price. Other enterprises that contribute to the tourism business and economy are the network of restaurants and bars, tours and attractions, and public goods maintained by public sector agencies e.g. utility services, access roads and community assets. These together provide the key infrastructure assets that add structure and flavour to the destination experience. The host population, with its unique charm and customs breathe life and vitality into destinations.

The destination and its supporting industry need to be properly planned and operated, however, within defined limits in order to reduce impacts, maximise benefits and deliver on the promise of improved livelihoods for indigenous populations. It may be viewed as a system representing a continuum of public goods, and private and natural assets. Public sector agencies are responsible for the construction and upkeep of public assets, supported by the private sector and the community. Typically, a mature tourism destination is well organised along the lines of its supply and demand networks, to ensure the efficient use of resources and transfer of goods and services. Hence, in-bound tour operators who bring visitors to the destination en masse, do so with the assistance of local private sector operators and service providers.

The business of tourism has also been categorised into numerous niches e.g. ecotourism, catering to visitors indulging in nature-based activities; sporting events, entertainment, business meetings and conferences hosted by the destination, which provide the main impetus for the visit; or resort vacations catering to families and individuals seeking rest and recreation. A more recent niche emerging in SIDS is medical tourism, which promises more affordable medical treatments to visitors. Marketing and promotions of the destination and its offerings play an important role in defining the niche and attracting the sought-after visitor.

When the physical, social and cultural elements of the destination are synchronously operated within a commonly held vision and objective, the experience is unparalleled and leaves the visitor satisfied, and the experience and assets untarnished. Too often, however, these elements operate without any overarching framework or guiding principle, which allow the business interests to prevail and, in some cases, transcend the undefined limits of capacity, good taste and decorum.

SIDS, with their smaller economies of scale, are particularly vulnerable to global events. These include:

- Global terrorism events such as 9/11 in the US, war and conflict in the Middle East and Africa, which have temporarily or permanently upset adjacent local and regional tourism.
- Natural disasters e.g. hurricanes, cyclones and tsunamis that affect SIDS in the Caribbean and Pacific each year. The 2004 Asian tsunami devastated many regional tourism industries, e.g. Maldives and Seychelles in the Indian Ocean. The overall effect is irreparable damage to infrastructure and reputation, which sets development at the destination back several years.
- The increasing use of the internet, while also providing benefits for the consumer, often purveys bad news and at lightning speeds around the world. The tourism industries in Thailand, Indonesia and other destinations affected by the 2004 tsunami learned this lesson, as arrivals dipped sharply in the months that followed. Visitors were scared away by the graphic and disturbing images of destructive waves, decimated towns and villages, and scenes of death everywhere.

- Escalating costs of energy, oil and food prices, which have driven up airline and other industry operating costs with dire consequences for many SIDS. With the consequent consolidation among the major carriers and the emergence of competitive low-cost carriers, these have either benefited those SIDS with good airlift service and infrastructure or seriously impacted those without.
- Changes in economic conditions at source markets, which affect outbound visitor flows and have had dire consequences for arrival numbers.
- Cruise industry dynamics, which also impact the destination experience in regard to the carrying capacity of local infrastructure, quality services and ecosystems.

Knowledge and understanding of a destination's vulnerability are key factors in planning for and managing resilience and in sustainably developing the tourism industry.

Sustainable tourism development

For the purposes of this discussion, the United Nations World Tourism Organization's (UNWTO's) definition on sustainable tourism is adopted:

> *Sustainability principles refer to the environmental, economic and socio-cultural aspects of tourism development, and a suitable balance must be established between these three dimensions to guarantee its long-term sustainability.*[6]

The key word in the definition is 'balance', as tourism sustainability infers that the destination is able to manage its exploitation, consumption and development of natural and cultural resources over the long term. The World Tourism Organization (WTO) advises, inter alia, that for tourism to be sustainable it should:

- Make optimal use of environmental resources
- Respect the socio-cultural authenticity of host communities
- Ensure viable, long-term economic operations
- Encourage informed participation of all relevant stakeholders
- Promote constant monitoring of impact
- Maintain a high level of tourist satisfaction

Guiding principles for national development and also for the tourism industry have been at the heart of multinational declarations and framework conventions, and have for many years embraced the concept of 'sustainability'. The SIDS group came together 16 years ago at a specially convened sustainable development conference for small islands. That meeting, held in Barbados in 1994,[7] produced the **Barbados Programme of Action** (BPOA), which specified the commitment made by member states at the national, regional and international levels in support of the sustainable development of SIDS. Since then other statements have also been articulated.[8]

The United Nations' Commission on Sustainable Development (CSD) has the task of monitoring the progress of the BPOA in its multiyear work programmes. The UNWTO has also been instrumental in the elaboration of numerous statements related to the sustainable development of tourism.[9] By their nature, however, most declarations, charters, codes or statements are non-binding. By signing onto these, SIDS are morally obligated to interpret, adhere to and implement the requirements. It should therefore suffice that each calls for responsible and timely development actions on the parts of the state and other national actors. This would ensure opportunities for equitable participation and benefits for all citizens and take account of prevailing global issues.

In addition to the above, the UNWTO has also produced other guidance documents on planning for sustainable tourism development at destinations.[10] Many provide comprehensive planning advice covering a range of topical issues, destination types and tourism developments, while also providing indicators for measuring and monitoring impacts and development progress.

Defining a sustainable tourism planning approach

In spite of the numerous declarations and statements outlined above, the problems of unsustainable tourism destination development abound. No single model for sustainable tourism development has evolved or been universally applied. This is a likely consequence of the fact that each destination presents its own unique geography, people, traditions and problems, which require custom-made rather than a 'one-size-fits-all' solution. An approach that has yielded improvement in destination management, where systematically applied, involves a hierarchical planning cycle involving repeated phases of plan development, implementation and monitoring. This is the basic premise of all national planning strategies, but it is one with which many SIDS struggle because of the discipline required for its successful adoption.

The first step in any planning cycle is articulating a planning method that is inclusive and built on principles of consultation and partnership. This activity should be led by the country's public sector tourism planning agency (or central planning authority), working in consultation and partnership with the tourism private sector. The plan process and method should be developed conjointly and discussed with all key stakeholders, interested parties and the national population. This approach is certain to achieve buy-in and relevance.

As a hierarchical process, the planning process should also lead to the establishment of an overarching policy and framework for the sustainable development of the tourism economy. A 'master plan' is the usual output, which should not be unduly burdened or delayed by the need for detailed local area planning in the initial phase.[11] The master plan should present the destination's vision, goal, purpose and strategy, as well as a general appreciation for the mix of available tourism assets and resources. It defines the major sustainable tourism goal and objective to be accomplished, describes the product in these terms and sets out the key planning steps and approaches to be followed (See box 8.1).

Box 8.1 Jamaica's master plan objectives for sustainable tourism development

In 2002, the Jamaica Ministry of Tourism and Sport produced its 'Master Plan for Sustainable Tourism Development'. This Plan resulted from extensive consultations, research exercises and analyses of the Jamaica tourism industry spanning five years. It involved the participation of a wide cross section of society: private sector groups, public sector agencies, civil society groups and other interested stakeholders. Its stated role and purpose, *inter alia,* is to 'provide a comprehensive planning framework for the development of the tourism industry' and to 'articulate a vision of the future direction, shape and composition of the industry to guide the actions of stakeholders to a common goal and purpose'.[12]

A master plan is essential for ensuring the orderly progress of plan implementation, as well as measuring and monitoring the achievement of objectives. Without it, development is likely to be chaotic and opportunistic. Sustainable tourism master plans, where they exist, are usually nested within national development plans and prepared by the ministries, departments or offices responsible for the sector. This maintains connectivity and relevance with other productive sectors.

Manning and Dougherty[13] describe sustainable tourism destination planning as a 'form of risk assessment'. They discuss the different elements at the destination that public sector planners must take into consideration, e.g. the availability and quality of public goods and services, and the tourism plant, including hotels, restaurants and attractions, which distinguish the destination's character. The authors also describe the basic demands of tourists to be personal safety and security, clean accommodations and food, accessible washrooms, and functional services at the destination, including currency exchange, telecommunications and transportation, among others.

In order to satisfy the demands of the 'customer' (e.g. visitors), all requirements – private, public, natural and tourism assets – should be analysed as an essential first step. The SIDS' challenge, however, is that tourism planning requires seamless and co-operative working relationships and shared resources among agencies that are either resistant to such co-operation or inhibited by their limited resources. Yet, given the UNWTO's requirements for tourism sustainability above, such collaboration is essential.

Establishing limits to tourism development

The most effective plans are painstakingly informed by detailed research, data analysis and interpretation. Research outputs typically provide an inventory of the tourism asset base, an appreciation of its extent and value, and an analysis of its vulnerabilities and sensitivities. These only serve to improve the process of decision-making and provide the basis for establishing limits to tourism development (see box 8.2).

Box 8.2 Fundamental principles for sustainable tourism development[14]

Fundamental principles necessary for sustainably defining tourism development limits and options:

- Decisions should be based on scientific evidence
- The 'precautionary principle' should be applied in situations where risks and limits are unknown
- Anticipate and prevent rather than detect and correct – prevention is more cost effective
- Plan in conjunction with other sectors and not in isolation
- Involve all stakeholders

Defining limits for tourism developments (e.g. location, scale, height, density) is useful for the orderly control of the pace and progress of development over the long term.

Use of carrying capacity and tourism indicators

Planners should routinely build monitoring and evaluation programmes into their destination planning, using appropriate indicators to determine when the carrying capacities of public and natural assets are close to the limits of unacceptable change. Planners should also measure the progress of tourism development against the specified targets and goals of the plan. Analyses should typically reflect variations of visitor arrivals and from source markets by season or by event, as well as the overall performance of the tourism asset base. In other words, greater emphasis should be placed on data collection, assembly and analysis, in support of plan objectives.

Visitor arrivals have typically been the preferred indicator of a destination's success. This indicator, however, provides no information on visitor preferences or on decisions to pursue vacation- or

business-related travel choices, which are more likely to provide a sense of the destination experience and/or customer requirements. The focus on visitor arrivals as a key indicator is perhaps the main reason why such an overemphasis is placed on marketing the destination, as opposed to developing and diversifying product offerings in accordance with customer preferences. Long data series can also inform destination contingency planning and preparedness for major upset events and build destination resiliency generally.

Data analysis is a powerful tool for destination planners if used judiciously with sufficient attention paid to accuracy and verification. Yet data collection and assembly are often subject to the planning agency's capabilities and resources, and for many SIDS are limited in extent and sophistication. The destinations that are able to transcend this challenge are those that will move closer to the objectives of sustainability.

Box 8.3 Sustainable tourism indicators

In 2005, the Caribbean Alliance for Sustainable Tourism (CAST), the environmental division of the Caribbean Hotel Association, commissioned a study of Performance Indicators and Sustainability Reporting for the Caribbean Tourism Sector.[15] The study examined a number of regional and international sustainable tourism initiatives, some of which were implemented regionally:

- The Quality Tourism for the Caribbean (QTC) standards for the hospitality industry
- The Green Globe benchmarking and certification programme for travel and tourism businesses
- The ISO 14000 series of standards for environmental management
- The UNWTO's indicators of sustainable development for tourism destinations
- The Association of Caribbean States' (ACS) sustainable tourism indicators
- The Caribbean Blue Flag Campaign criteria
- The Audubon Cooperative Sanctuary System for Golf Courses
- The Institute of Responsible Tourism – Biosphere Hotels Label
- The Natural Step
- Touristik Union International (TUI) environmental policy and checklist
- The European Package Travel Directive, 1990, and related national travel consumer protection legislation
- The International Hotels Environment Initiative
- British Airways Holidays

The study concluded, inter alia, that the most effective sustainability indicators are those that monitor the key tourism sustainability risks and concerns and provide information that clarifies issues and measures responses. In this regard, the most commonly repeated areas of concern among the above environmental and sustainability initiatives were natural resource conservation, environmental protection, awareness and education, hygiene and safety (especially food safety), and social development, which were also determined to be the critical areas to be monitored and measured. In light of this, destination-level indicators were identified for:

- Environment/conservation: energy, water, solid waste, sewage treatment, recreational water quality, food safety and hygiene, pool management, chemicals use, landscape and built environment
- Economic: visitor arrivals, tourism receipts, incentive programmes and participation, labour, employment and related benefits, host community benefits
- Social: local involvement, community outreach, promotion of culture

Promoting sustainable development

Studies, research and analyses should therefore lay the groundwork for:

- a consistent and workable public sector policy framework, incentive programmes and an enabling legislative and enforcement regime,
- identifying appropriate development options,
- setting sustainable site development guidelines and standards,
- promoting sustainable use and consumption of resources, and
- Promoting sustainable facilities operations and maintenance.

These are discussed further below.

Public sector policy framework

Sustainable tourism development must be pursued through determined and effective leadership from the framers of public policy. They should acknowledge the difficulties faced by public sector planners over the years, and recognise the development challenges at the destination. As imperatives for change are driven by the health and wellbeing of SIDS and their island populations and ecosystems, this should inspire the leadership to promote innovation and quality.

An effective public sector policy framework provides the guiding framework for sustainable tourism development. Policies should be informed by review and analyses of individual SIDS' operating environments and present clear, workable incentives for action (see box 8.4).

Box 8.4 Government of Barbados establishes its policy for a green economy

The Prime Minister of Barbados outlined his administration's 'Green Economy Fiscal and Economic Proposals' in his 14 March 2007 budget speech. In this major policy speech, the Prime Minister indicated that: 'The notion of a green economy must be underpinned by the philosophy of putting Barbados on a sustainable economic growth pattern that incorporates prudent environmental management principles. What is now needed is for us to further integrate green principles into national economic planning, marrying economic growth with environmental management and preservation'. Three principles for action were articulated:

- 'We should not exploit resources at a rate greater than we can assimilate the waste that is generated.
- 'We should not exploit [groundwater] resources at rates greater than they can be replenished.
- 'Non-renewable [energy] resources should not be depleted at rates greater than they can be replaced by renewable resources'.

In many cases, the growth of SIDS' tourism industries has been so rapid and fortuitous that problems have now become acute and manifest economically, environmentally and socially.[16] The most commonly cited are:

- land development pressures (e.g. competition for prime real estate, speculative pricing) caused by lack of clear tourism planning policies, guidance frameworks, controls and weak cross-sectoral linkages and enforcement,
- poor construction methods involving clear felling, indiscriminate removal of top soil and vegetation cover causing increased run-off, pollution, loss of habitats and ecosystems, especially along coastal areas,

- competition for potable fresh water supplies,
- costly energy supplies, energy inefficiency with limited focus on conservation or green house gas emissions,
- generation of solid wastes with limited waste management, reduction and recycling practices or facilities,
- seasonal employment trends, low wages and skills levels, high staff turnover at tourism facilities,
- lack of integration of the industry with other key sectors, e.g. infrastructure, agriculture and transportation, and
- leakage of tourism receipts, limited data monitoring and collection capabilities.

Many SIDS have shifted towards more inventive policy instruments and the use of strategic plans as a remedy for controlling island-wide impacts and improving sector linkages and benefits. These relate to the current issues of promoting energy conservation by both private and public sector tourism entities, thereby creating a culture of conservation at the destination.

A good and supportive policy framework is essential for achieving tourism product diversity, improving human resource opportunities and skills, creating a more wholesome destination experience, and for maintaining healthy and sustained growth rates. In order to maintain their competitiveness, the more mature sun–sea–sand destinations will need to reorient the destination towards new niche concepts that focus on nature-, heritage-, culinary- or event-based experiences.

Identifying appropriate development options

Strategic tourism plans should also describe the desired development concepts and options in clear and unambiguous language. These prioritised development options should also be scrutinised for their environmental, social and economic impacts, and adjustments made wherever required. Investors have benefited from gains from the pursuit of 'greening' initiatives and business approaches.

Many new hotels are pursuing, for example, Leadership in Energy Efficiency Design (LEED) certification in the US, which certifies that new buildings have been designed to achieve high levels of energy and water-use efficiencies. A menu of incentive options should be available to investors, which encourage high consumption efficiencies and maximise benefits to local communities. This approach would signal vision, clarity and firmness of purpose of the destination's tourism development plan.

Setting sustainable development guidelines and standards

All development is subject to site development standards and guidelines. These set zoning and site density limits, environmental performance standards and the like. Zoning is a familiar planning practice for ensuring an appropriate use of development space, preserving its special characteristics and the juxtaposing of related activities. It also serves the purpose of meeting the needs of communities. Most SIDS have planning or development legislation that requires development forms to be zoned. However, such legislation has been weakly enforced, is outmoded or has been overtaken by development pressures.

The zoning objective from the perspective of the destination planner should be to help visitors and locals appreciate the natural and cultural uniqueness of the destination. More importantly, the imperative for sustainability is to 'determine the **relationships** between site factors and how those

factors will adapt to change. Understanding these relationships also clarifies how development impacts from one area … will affect other areas'.[17]

The imperative must therefore be to ensure that development goals and objectives as articulated in the tourism master plan are met, and any changes (desirable or undesirable) are effectively anticipated, monitored and, where necessary, mitigated. Planners should use this important technique to maximise prime real estate at the destination, yet simultaneously preserve areas with valued ecosystem and heritage resources.

The sustainable approach also requires an appreciation of the level of investment required from the public sector for infrastructure to maintain service continuity and quality over the plan period. The focus is on services. The opportunity cost for lost, degraded or altered ecosystems and their value-adding services is seldom reflected in the public accounting. Ecosystems such as mangroves, reefs and forests provide services ranging from shoreline protection, beach sand replenishment and fish nurseries, to potable water supply and 'scrubbing' of nutrients and sediments from rivers and streams. With the loss of key ecosystem services, the opportunity cost of remediation, repairing, stabilising and cleaning up prime tourist zones should provide the basis for defining site development priorities and standards.

Not to be overlooked is the abundance of tourism development guidelines and technical expertise available from the international community. For example, the UN-WTO's *Indicators of Sustainable Development for Tourism Destinations* (2004) and other documents that cover topics ranging from standards and certification, and impact analyses to the wellbeing of tourism communities, sustaining cultural assets and capturing economic benefits from tourism, among others. UNEP's Secretariat on the Convention of Biological Diversity has produced its own *Guidelines on Biodiversity and Tourism Development* for public sector planners.[18] The Pro-Poor Tourism Partnership has developed guidelines for establishing private and public sector collaboration and linkages in the tourism sector and ensuring that local communities benefit from the industry.[19] These resources are available to planners on a variety of topical and procedural issues, which should assist in the building of capability and resiliency at the destination.

Promoting sustainable resource use and facilities operations

A sound policy framework can also promote the sustainable use and consumption of resources, especially water and energy, by the private sector and communities. These can take the form of recognition, reward or incentive schemes for participating in or supporting conservation programmes or implementing conservation standards and certification programmes. For example, in recognising the Green Globe standards and certification programme for the tourism sector, the Government of Barbados in 2007 provided a tax write-off incentive to participating tourism businesses at the rate of 150 per cent of the cost incurred.

Codifying the development of historic and cultural resources

Refreshing or maintaining the destination's image and value-added will always be a challenge, but cultural and heritage resources present the best available opportunities for creating new niches. There are many SIDS that appear on UNESCO's listing of World Heritage Sites for their natural or cultural treasures (architectural, historical, religious etc.) or those with outstanding universal value, which if sustainably managed will continue to be an abiding source of intrigue and mystery for visitors.

The destination master plan should therefore require proper, accurate and interesting interpretation of natural, cultural and historical treasures. Interpretation is authentic and interesting when it encapsulates the vernacular, draws appreciation and co-operation from nationals, and engages the imagination and curiosity of the visitor. The existence and enforcement of historic preservation and design codes can help to preserve the destination's cultural and historic attractions from the pressures of development.

Managing for sustainability

Even with all the above instruments and approaches in place, sustainably managing tourism development is still very much a function of leadership within the public, private and community sectors. Partnership and shared responsibilities between the sectors for the benefit of locals and the delight of visitors is a core requirement, as is a consistent management framework and adherence to good governance and the rule of law, with clear lines of responsibility and authority established to accomplish defined goals and targets.

Sustainable tourism requires that a decision be made at the leadership or political levels for the integrated functioning of all institutional, economic and productive sectors. This is always the challenge for SIDS where sectors are allocated to government ministries, offices and/or departments with a poor reputation for effective collaboration and co-operation.

Systematic planning and teamwork is still perhaps the most effective approach available to SIDS to accomplish sector linkages, sustainable planning and management of tourism destinations. Teams may be permanent (e.g. standing committees) or they may be temporary (task forces) appointed for specific periods and tasks.

Strategic or tactical teams (e.g. ministerial committees, task forces, project teams etc.) with multi-sectoral membership have been used by SIDS to address each of the issues outlined above. In the final analysis, mainstreaming sustainability in day-to-day planning and management requires that such teams be taken seriously by assigning authority, responsibility, accountability and adequate resources in order that they may deliver on their mandates effectively.

References

Ashley, C, H Goodwin, D McNab, M Scott and L Chaves (2006) *Making tourism count for the local economy in the Caribbean: Guidelines for good practice*. Pro-Poor Tourism Partnership in association with the Caribbean Tourism Organization, April 2006.

Cruz, R G (2006) Towards Sustainable Tourism Development in the Philippines and Other Asean Countries: An Examination of Programs and Practices of National Tourism Organizations. Philippine APEC Study Centre Network (PASCN) Discussion Paper No. 2003–06. Quezon City: University of the Philippines Diliman, Asian Institute of Tourism.

European Development Fund (EDF) (2006) Performance Indicators and Sustainability Reporting for the Caribbean Tourism Sector. PA Government Services, Inc., Project No. 8 ACP RCA 035, August 2006.

Government of Barbados (2007) Green Economy Fiscal and Economic Proposals. Economic and Financial Policies of the Government of Barbados. National Budget Speech presented by the Rt. Hon Owen Arthur, Minister of Finance, Government of Barbados, 14 March 2007.

Government of Jamaica (2002) Master Plan for Sustainable Development: A Synopsis. A Project of the Ministry of Tourism and Sport, in collaboration with the Commonwealth Secretariat and support from the IADB.

Manning, E W and T D Dougherty (2000) 'Planning Sustainable Tourism Destinations'. *Tourism Recreation Research*, Vol. 25: No. 2, pp. 3–14.

Pro-Poor Tourism Partnership and the Caribbean Tourism Organization (2006). Funded by the UK Travel Foundation with assistance from CRSTDP and EU, First Choice and TUI. Available at: http://www.propoortourism.org.uk [last accessed 7 July 2010].

Secretariat of the Convention on Biological Diversity (2004) Guidelines on Biodiversity and Tourism Development: International guidelines for activities related to sustainable tourism development in vulnerable terrestrial, marine and coastal ecosystems and habitats of major importance for biological diversity and protected areas, including fragile riparian and mountain ecosystems. CBD Guidelines. Montreal: Secretariat of the Convention on Biological Diversity; 29pp.

UN Department of Economic and Social Affairs, Statistical Division (2003) World Statistics Pocketbook Small Islands Developing States. Special Issue, Series V, No. 24/SIDS. New York: UN Department for Economic and Social Affairs.

UN-WTO (2004) *Guide for Local Authorities on Developing Sustainable Tourism*. Madrid: UN-WTO Guidebook.

US Government, Department of the Interior (1993) Guiding Principles of Sustainable Design. United States Department of the Interior, National Park Service, Denver Service Center, September 1993.

World Bank (2005) A Time to Choose: Caribbean Development in the 21st Century. World Bank, Caribbean Country Management Unit; Report No. 31725-LAC, April 26 2005.

World Summit on Sustainable Development (WSSD) (2002) The Johannesburg Plan of Action. Available at: http://www.worldsummit2002.org/ [last accessed June 2009].

World Tourism Organization (2009). Available at: http://www.world-tourism.org/frameset/frame_sustainable.html [last accessed June 2009].

World Travel and Tourism Council (WTTC) (2009) The 2008 Travel and Tourism Economic Research. London: World Travel and Tourism Council.

Notes

1. World Travel and Tourism Council (WTTC) (2009). Available at http://www.wttc.org [last accessed 7 July 2010].
2. See: http://www.wttc.org [last accessed 7 July 2010].
3. Ibid.
4. Ibid.
5. SIDS graphs compiled and adapted from various data sources, but principally the UN Department of Economic and Social Affairs Statistical Division (2003) World Statistics Pocketbook of Small Island Developing States. Available at: http://www.sidsnet.org/docshare/other/20040219161354_sids_statistics.pdf [last accessed 7 July 2010].
6. See: http://www.world-tourism.org/frameset/frame_sustainable.html [last accessed 7 July 2010].
7. The first Global Conference on Sustainable Development of SIDS was convened in April 1994 in Bridgetown, Barbados.
8. The Johannesburg Plan of Action, from the World Summit on Sustainable Development (WSSD) in 2002, which reiterated the relevance of the BPOA; and the Mauritius Strategy to Review the Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States of January 2005.
9. Over the years, the following UNWTO declarations related to sustainable tourism have been articulated. A detailed discussion on each is beyond the scope of this chapter:
   - Manila Declaration on World Tourism, 1980
   - Acapulco Documents on the Rights to Holidays, 1982
   - Tourism Bill of Rights and Tourism Code, Sofia, 1985
   - The Hague Declaration on Tourism, 1989

- Lanzarote Charter for Sustainable Tourism, 1995 (jointly with UNEP, UNESCO, EU)
- Statement on the Prevention of Organized Sex Tourism, Cairo, 1995
- Agenda 21 for Tourism and Travel Industry, 1996
- Global Codes of Ethics for Tourism, 1999
- Hainan Declaration – Sustainable Tourism in the Islands of the Asia-Pacific Regions (2002)
- Québec Declaration on Ecotourism, 2002
- Djerba Declaration on Tourism and Climate Change, 2003

10. For example UN-WTO (2004).
11. Detailed local area plans should be the responsibility of local, municipal or state governments, and should be consistent with the goals, objectives and strategies of the master plan.
12. Government of Jamaica, September 2002; 61pp.
13. Dr Edward W Manning and T David Dougherty, 2000.
14. Ibid.
15. The study (Lot 1 Research Capacity) was conducted by PA Government Services under the Caribbean Regional Sustainable Tourism Development Programme (CRSTDP), funded by the 8th European Development Fund (EDF), August 2006. PA Government Services, Inc., Project No. 8, ACP RCA 035; 141pp.
16. See Reil G Cruz, 2006; 47pp. Available at: http://pascn.pids.gov.ph/DiscList/d03/s03-06.PDF. Also World Bank, Caribbean Country Management Unit, 2005.
17. United States Department of the Interior, 1993; 117pp.
18. Ibid. note 6. Also Secretariat of the Convention on Biological Diversity, 2004; 29pp.
19. Ashley et al., 2006. Also Pro-Poor Tourism Partnership and the Caribbean Tourism Organization, 2006.

Veniana Qalo and Derrick Akintade

Emerging Lessons from Integrating Labour and Fisheries into Trade Agreements: A New Vision for the Pacific Region

Chapter 9

Introduction

The economic vulnerability of small states, including those in the Pacific region, has largely been attributed to their inherent characteristics and problems. These include their physical isolation and distance from main markets, minimal share of world trade, low productivity and insufficient supply, inability to diversify production, high transport and transit costs, difficulties in attracting foreign investment, and low competitiveness.[1] The literature has also shown that there are notable examples where small island states such as Barbados, Malta and Cyprus have managed to build relatively high resilience through sound macroeconomic management and good governance policies (Briguglio et al., 2006).

The rapid pace of globalisation, coupled with the financial and economic crisis, food price hikes and climate change, present new opportunities and challenges for developing countries, particularly small states and least developed countries (LDCs). The Pacific region is not immune and is increasingly tested as it seeks to develop, formulate and implement policy responses to build up its economic resilience in order to achieve sustained economic growth and higher living standards for its people.[2]

With aid levels declining to the Pacific Islands Forum countries (Forum island countries – FICs), also known as the Pacific ACP (African, Caribbean and Pacific Group of States) countries (PACPs), various avenues are being pursued to improve their competitiveness, productivity and to find new export markets for their products (fisheries, forestry) and service (tourism). The continuous erosion of trade preferences for traditional exports (e.g. sugar, fish and canned tuna, tree crops etc.) to developed country markets will have a significant impact on the future livelihood prospects of farmers and fishermen and women in these small island states. Development-oriented 'circulatory' migratory schemes for unskilled/semi-skilled workers continue to be explored by the region to address the rapid population increase, with people potentially seeking work in Melanesian and Micronesian countries (Graf and Kamenasu, 2006).

The Pacific region has now developed and agreed on a new vision for a region that is 'respected for the quality of its governance, the sustainable management of its resources, the full observance of democratic values, and for its defence and promotion of human rights'.[3] The Pacific Plan,[4] which provides the agreed framework for realisation of this vision through enhanced regional co-operation and economic integration, is centred on four pillars which all members of the Pacific Forum have endorsed.

This chapter is divided into five sections. The first section provides an overview of FICs, including some of the main obstacles they face as small states, as well as observations on their economic performance to date. The second section provides a brief introduction to the Pacific Plan, and also reflects on a number of fundamental conditions that Pacific Forum countries have agreed to if international trade is to deliver positive outcomes for them. The next sections outline rationales for prioritising labour mobility and fisheries in the two regional trade arrangements, i.e. the Pacific Island Countries Trade Agreement (PICTA) and the Economic Partnership Agreements (EPAs). The final section draws a number of conclusions based on the above assessment. Reference will only be made to the Pacific Agreement on Closer Economic Relations (PACER Plus) where linkages can be drawn with the ACP–European Union (EU) EPA negotiations.

Pacific Islands Forum countries (FICs) – setting the context

Most Pacific islands are typically characterised by a small landmass, but they vary enormously in terms of size of economy, natural resource endowments, population size and GDP growth. In terms of the overall economic progress of the Pacific island countries, table 9.1 illustrates that growth and development vary between the countries. For Cook Islands, Fiji Islands, Samoa, Tonga and Vanuatu, tourism, agriculture, fisheries and some basic industries have been the main sources of growth.

Table 9.1 Pacific Forum member states: average annual GDP growth, population and Human Development Index (HDI) (2008)

Country	*Average annual GDP growth*	*Population (thousands, 2008)*	*Annual population growth (1998–2008)*	*HDI (2007)*
Cook Islands	3.6	21	1.9	0.829
Fiji Islands	2.0	838	0.5	0.718
Kiribati	1.6	99	0.1	0.597
Marshall Is., Rep. of	2.3	53	1.7	0.708
Micronesia, Federated States of	0.5	108	0.5	0.716
Nauru	(9.6)	10	0.3	0.637
Palau	1.0	20	0.9	0.810
Papua New Guinea	2.3	6,450	4.1	0.437
Samoa	3.5	182	0.6	0.762
Solomon Islands	1.4	524	2.9	0.579
Tonga	1.8	102	0.3	0.730
Tuvalu	3.0	10	0.5	0.691
Vanuatu	2.4	233	2.5	0.640

( ) = negative, GDP=gross domestic product

Source: Asian Development Bank Pacific economic database; and Human Development Report, 2008[5]

For Papua New Guinea (PNG) and Solomon Islands, growth has largely been resource-based – predominantly oil, forestry etc. For Kiribati, Marshall Islands, the Federated States of Micronesia (FSM), Nauru, Palau and Tuvalu, income is generated from tourism, fish processing and licensing, trust fund incomes and remittances.

The Pacific islands face a number of labour market challenges, characterised by shortages of adequately skilled people and an oversupply of unskilled workers. Government spending is heavily dependent on revenues from import duties – which comprise up to 50 per cent of some of Pacific island governments' revenues. Remittances provide an increasingly important revenue or income stream in the region (see table 9.2). However, since the financial and economic crisis, remittance receipts have been on a downward trajectory in the Pacific islands. For example, in Fiji, a 26.7 per cent annual decline in remittance receipts was registered for 2008.[6]

Table 9.2 Remittance inflows in Pacific island countries, 2000–2008 (percentage of GDP)

	2000	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*
Fiji	1.6	1.7	1.5	6.3	7.5	7.4	6.2	6.0	6.2
Kiribati	10.5	11.2	9.7	7.7	7.0	6.6	6.6	5.5	6.4
PNG	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
Samoa	19.5	18.8	17.1	14.0	22.8	25.3	24.0	22.0	25.2
Solomon Islands	0.7	0.7	0.9	1.7	3.2	2.3	5.7	4.8	3.9
Tonga	30.1	39.0	44.3	32.7	33.3	30.3	30.3	38.4	35.8
Vanuatu*	14.3	22.6	1.8	1.4	1.5	1.4	1.2	1.0	1.2

*Estimates do not include regional seasonal worker inflows.

Source: World Bank staff estimates based on the International Monetary Fund's Balance of Payments Statistics Yearbook 2008.[7]

Investment data for the FICs is notoriously weak. Notwithstanding, there are some clues that suggest levels of domestic (government and private sector) and inward foreign direct investment (FDI) have been very low. Between 1991 and 1993, Vanuatu, Solomon Islands and Fiji featured in the top 10 destinations for FDI in developing Asia. However, between 1998 and 2000, only Vanuatu and Fiji remained listed, having slipped down the rankings. Fiji's domestic political situation might provide an explanation there. For Fiji and PNG, investment growth between 1999 and 2000 was around 11–12 per cent of GDP – well below the 25 per cent generally regarded as necessary for achieving steady growth. A study concluded that FDI inflows in the region were failing to keep pace with the depreciation of existing capital stock (UNCTAD: 2001).[8]

Most FICs remain highly dependent on external trade. Australia and New Zealand are the FICs' main trading partners, accounting for 57 per cent of Samoa's exports, 47 per cent of Cook Islands' exports, 24 per cent of Fiji's exports and 26 per cent of Papua New Guinea's exports (Scollay and Gilbert, 2001). The EU is the Pacific ACP region's second most important trade partner. In 2005, EU-bound exports from the region were valued at around 1,245 million euros (€) and imports from the EU were valued at around €568 million. The US is an important destination for canned fish exports from Fiji and PNG. The Asian markets of Singapore, China and Japan are of increasing importance to the region, particularly for Solomon Islands, Vanuatu and Papua New Guinea.

By contrast, intra-FIC trade accounts for very small share of the region's total trade (Scollay, 2001). Only Tuvalu, Kiribati and Samoa's total trade accounts for more than 10 per cent of total intra-FIC trade. For the others (such as Solomon Islands, Fiji, Nauru, Marshall Islands, PNG, FSM and Palau), intra-FIC trade accounts for less than 4 per cent of total trade. The low level of intra-FIC trade reflects a number of factors, including high transportation costs (owing to large distances separating the islands) as well as existing trade barriers – the latter are expected to be reduced or eliminated under their free trade agreement, PICTA.

The Pacific Plan: setting out regional priorities for sustainable trade and investment

The Pacific Plan is intended to herald the dawn of a new '**Pacific Regionalism**'. It embodies the expectation of significant change in the nature of relations, especially trade and economic relations, between all members of the Pacific Forum. This new **Pacific Regionalism** is to be founded, initially, on a commitment to greater **regional co-operation** (e.g. services provided nationally, but based on increased co-ordination of policies between countries). This is be followed by a gradual movement towards greater **regional provision of public goods/services** and/or **regional integration** (e.g. lowering market barriers between countries). The Pacific Plan is estimated to deliver a reduction in the costs of poor economic governance to the tune of US$8 billion in PNG, Solomon Islands and Fiji Islands.[9]

The Pacific Plan represents an important step in securing a comprehensive framework for the pursuit of common objectives through regional co-operation and action. The Plan sets out four pillars on i) economic growth, ii) sustainable development, iii) democracy and iv) security. Responsibility at the regional level for policy advice, co-ordination and assistance in implementing decisions taken in the context of the Pacific Plan will rest with the Pacific Islands Forum Secretariat (PIFS).[10] The objective is not to replace or undermine existing or future national development plans and strategies, but rather to support, complement and reinforce them. It is a regional approach or strategy, to be pursued only where it is expected to 'add value' to individual member or national efforts.

The **economic growth pillar** of the Pacific Plan endorses a number of sectors where regional co-operation and action on trade-related matters is deemed to warrant priority attention. These include initiatives relating to better access to markets and goods, trade in services (including labour), fisheries and tourism.

It is perhaps not surprising that the Pacific Plan has identified fisheries as a priority sector for regional co-operation. In addition to being an important source of foreign exchange and employment, fisheries contributes to poverty alleviation and food security in the region. The emphasis placed in the Pacific Plan on the adoption of an ecosystem approach is consistent with the regions' coastal fisheries policy (Apia Policy).[11] The level of exploitation of different fish species (including skipjack tuna and albacore) clearly varies, and there remains some uncertainty with respect to the status of the overall fish stocks. The Forum Fisheries Agency (FFA) has indicated that limits have been reached on the regional tuna and several inshore fisheries.[12]

Labour mobility is of increasing importance to economic development in the FICs. The priority granted to labour mobility in the Pacific Plan derives not only from the findings of a number of recent studies, but also the historical experience of a number of the FICs with bilateral labour mobility agreements. In particular studies,[13] including those commissioned by the Pacific Islands Forum Secretariat, have proposed elements of a possible development-oriented framework for labour mobility that would both seek to address future population pressures in the region, as well as facilitate a greater flow of remittances to the region.

To reinforce the priority attached to fisheries and labour mobility, a number of specific initiatives and milestones against which implementation progress would be measured and assessed are set out in the Pacific Plan.[14] The main focus is in enhancing market access for Pacific island workers, as well as expanding sustainable trade in fisheries resources into developed country markets through regionalism, including free trade agreements.

The Pacific Plan is therefore notable in three important respects:

- The emphasis placed on linking regional priorities and action to national development priorities. For example, FICs are required to incorporate the identified regional priorities into national sustainable development strategies (NSDS), where appropriate.
- The emphasis placed on the pursuit of greater coherence in negotiations between Pacific Forum members with external trading and other partners. For example, aspirations regarding the application of any labour mobility arrangements secured in the context of the EPA negotiations as a benchmark for any future trade agreements with Australia and New Zealand under PACER Plus.
- The commitment it has made to monitor progress through the use of common indicators across the region in all the identified priority sectors.

The successful implementation of the Pacific Plan will require a number of hurdles to be overcome. One obvious challenge will be to maintain sustained political commitment on the part of individual FIC member governments to support and complement these regional initiatives through their own national development programmes.[15] Another challenge, particularly with respect to regional-level negotiations on fisheries, will be to maintain coherent and unified negotiating positions.[16] A third challenge will be to produce measurable national-level indicators that are comparable across the region – for example, there is an acknowledged dearth of fish stock data and assessments.

The recent financial and economic crisis, food, fuel, security and climate change challenges further threatens the growth and development prospects of Pacific island countries in terms of declining remittances, investment and trade.

Labour mobility in the Pacific Forum island countries

Labour mobility has become an outlet for the population pressures evident in many island nations, and remittances sent home play a vital part in the economy of countries such as Tonga, Samoa, Niue, Tuvalu, Kiribati, Cook Islands, Wallis and Futuna and Fiji. These patterns of migration provide benefits such as the transfer of remittances, the repatriation of skills and education, the promotion of tourism and the seeding of funds for small business development (Brown and Walker, 1995). However, migration also has social costs. The immigration policies of developed nations favour those with skills and high levels of education, and there is extensive literature on the 'brain drain' from the Pacific as rugby players, teachers, nurses, accountants and other professionals and tradespeople move to jobs offshore that offer better pay or career advancement.

The Pacific island countries have a history of bilateral and other agreements with a number of developed countries, including the USA and New Zealand, to facilitate the movement of their citizens. In the 1980s, Fiji citizens benefited from opportunities under a temporary migration scheme for farm workers to New Zealand. Fiji citizens have also taken advantage of migration opportunities to Australia and New Zealand under skilled and family migration streams, and through finding niche employment elsewhere. There are other bilateral labour movement arrangements that also favour the movement of Polynesians and Micronesians (e.g. Samoa Access Quota) to New Zealand.

The pressing need to find jobs for Pacific island workers coincides with the emergence of gaps in the labour force of developed nations. In countries such as Australia, lower birth rates, the ageing demographic profile, increased personal wealth, the provision of social welfare, sustained economic growth, low unemployment and higher levels of education have combined to reduce

the supply of workers who are available (or willing) to undertake physically demanding labour for relatively low pay. This has opened up debate about the potential for temporary employment schemes for Pacific islanders to work in overseas labour markets, particularly in seasonal pursuits in agriculture. Similar interests have been advocated by Pacific island countries in regional trade agreement negotiations with the EU under the EPAs, the deepening of the PICTA and potentially in the current PACER Plus. Existing bilateral labour mobility arrangements like the Tuvalu and Kiribati seafarers' schemes[17] and elements of other relevant schemes (e.g. the Canadian seasonal workers' scheme)[18] have been used as a basis for formulating demands on labour mobility in these negotiations. Capacity building and skills upgrading are key development components of these negotiations, to facilitate the absorption of workers within temporary migration schemes.

In their EPA negotiations with the EU, the Pacific island countries (also referred to as PACPs) have proposed the introduction of a system of incentives and as part of their 'Managed Migration Scheme' in order to maximise the number of returnees (return migration policy). These include compliance with regulations of the scheme directly linked to rewards – such as guaranteed future opportunities for temporary movement, social security contributions paid in the EU and/or a proportion of wages earned to be available upon return, as well as public servants involved in the scheme being allowed to re-enter public service without loss of seniority and leave entitlements. Private participants under the scheme would be provided with active assistance in finding a job. Recognising that the problem of 'overstaying' would continue to be a concern under any such scheme, the region would continue to work with the EU to ensure effective mechanisms are in place.

Generally, there has been a great reluctance by developed country trading partners to include the movement of semi-skilled or unskilled workers within the framework of regional level agreements. This situation is in marked contrast to bilateral arrangements, which have served to facilitate the temporary movement of workers, including semi-skilled and unskilled workers, from the relevant participating countries. However, the compatibility of such arrangements with World Trade Organization (WTO) commitments has been the subject of debate in Geneva, within the context of the expiry of the Uruguay Round most-favoured-nation (MFN) exemptions.[19]

The PACPs are also pursing bilateral approaches to securing temporary jobs for their semi-skilled and unskilled workers in selected EU member states and in services sectors of development interest to the region – where similar demand exists in Europe. The aim is to secure an agreement that is compatible with the development criteria of the envisaged 'Managed Migration Scheme'.

In 2006, the New Zealand government announced the launching of a Regional Seasonal Employment Scheme (RSES), which allowed for the employment of unskilled workers from five 'kick-start countries' (Kiribati, Samoa, Tonga, Tuvalu and Vanuatu). At the time of writing, the scheme had entered into its second season. A number of issues arose in the first season of the scheme, and these need to be addressed through more extensive policy dialogue involving the New Zealand Department of Labour.

In Solomon Islands, a pre-feasibility study to explore the possibilities of implementing a pilot scheme for its caregivers was commissioned in 2007. The results of this now form the basis for consultations with the Canadian government for its qualified workers, an initiative currently undertaken by Solomon Island government in partnership with Canadian caregiver recruitment agencies. The application of this pilot scheme to other Pacific island countries is currently being considered as part of a second phase.

At the multilateral level, economic integration for trade in services and labour are dealt with within the context of the WTO General Agreement on Trade in Services (GATS) Article V and the Annex on

Temporary Movement of Natural Persons. For their part, Pacific island governments have similar interests with other WTO 'demandeurs' advocating for liberalised market access for semi-skilled and unskilled workers.

Fisheries and regional integration in the Pacific

The fisheries sector has traditionally been important to Pacific island countries, and will continue to underpin the social, cultural and economic wellbeing of its people in the future. In Pacific island countries where fish processing and licensing are a key source of growth, creating and maintaining policies that support sustainable resource management along with increasing international competitiveness will pose a challenge for these capacity constrained economies.

Pacific island states conduct their fisheries policy at the national, sub-regional and regional levels. Two key bodies are responsible for co-ordinating fisheries policy in the region, namely the sub-regional Parties to the Nauru Agreement (PNA) and the regional South Pacific Forum Fisheries Agency (FFA). Technical and scientific advice is provided through the Secretariat of the Pacific Community (SPC).

The sustainability of the fisheries sector in the region is largely being supported and promoted through existing management regimes reinforced through FFA programmes and a number of treaties, such as the US Western and Central Pacific Fisheries Convention. The extent to which these current arrangements are robust enough to address growing concerns regarding corruption and bribery in the fisheries sector is questionable. The adequacy of existing monitoring, control and surveillance systems is also of a concern, given that the region is not immune from fishery border control challenges including illegal, unreported and unregulated (IUU) fishing.

- Trade negotiations on fisheries at the bilateral, regional and multilateral levels are of significant importance to the FICs in three main respects:
- The impact on **access fees**. Access fees are paid by distant water fishing fleets and are a major source of government revenue.
- The impact on the activities of **domestic and foreign fishers operating for export in the EEZ and territorial sea** of the region. These activities play an important role in supplying canneries, loining facilities and domestic processing facilities.

The impact on the activities of **artisanal fisheries** within the territorial sea for the domestic and export markets. Artisanal fisheries are the most important source of protein intake and are critical to household food security.

Oceanic fisheries cover migratory pelagic species, including tuna. These fisheries are mainly targeted by non-Pacific island states' **distant water fishing (DWFs)** purse seine vessels under access agreements, and catch is usually skipjack tuna or albacore. The current value of this catch is approximately US$2 billion, with a landed volume of 1,650,000 tonnes. **Pacific island domestic tuna fisheries**, on the other hand, comprise mainly small domestic longliners or purse seine vessels mainly targeting albacore, bigeye and yellowfin tuna. The domestic or locally based fleet includes 19 vessels in PNG, five in FSM, five in Marshall Islands, one in Kiribati, two in Vanuatu and three in New Zealand. The current value of the domestic catch is approximately US$5–700 million, with a landed volume of around 260,000 tonnes.[20]

The other fisheries sub-sector, **coastal fisheries**, covers near-shore and coral-reef species. This includes the **domestic food fisheries** and the **coastal export fisheries** – also referred to as **'artisanal/ small-scale' fisheries**. The former largely comprises fish caught for domestic consumption, but

there is now a move towards commercialisation in some Pacific island countries. The latter, however, is where 'fisheries sustainability' issues exist – the current value of the catch in this sub-sector is around US$50–80 million (Gillett and Lightfoot, 2001).

Marine and freshwater farming or **'aquaculture'** is also becoming significant in the region, such as the black-pearl farms in Cook Islands and French Polynesia, as well as tilapia, shrimp and seaweed – the economic value of this sub-sector is estimated at US130–180 million (as at 2000, Gillett and Lightfoot [2001]).

Access fees paid by distant water fleets are an important source of revenue for governments in the region (see table 9.3). Japan is the largest distant water fishing nation in the region (active in all three major fisheries). It has bilateral agreements with eight Pacific island states.[21] Access fees are paid on a 'per trip' basis and funded by the Japanese fishing industry. The Japanese government also provides fisheries grant aid and technical co-operation support. The access fee is on average about 5 per cent of the catch value, using the previous three years catch to calculate the fee level. Almost all Japanese-caught tuna is landed in Japan.

Table 9.3 Exports and access fees of selected Pacific island countries (1999)

Country	*Estimated exports (US$)*	*Estimated catch[a] (tonne)*	*Estimated value of catch (US$)*	*Access fees (US$)*	*Access fees as % of catch*
Fiji	23,000,000[b]	15,600	40,000,000	212,000	0.053%
Federated States of Micronesia	4,623,000[c]	134,499	180,000,000	15,400,00	8.6%
Kiribati	2,302,000[d]	138,000	139,000,000	20,600,000	14.8%
Marshall Islands	473,000	33,217	50,000.000	4,984,000	9.96%
Nauru	0	41,000	37,000,000	3,400,00	9.2%
Papua New Guinea	48,000,000 (85,000)	141,000 (75,000,000)	140,000,000	5,840,000	4.1% (7.3%)[e]
Solomon Islands	5,000,000	74,000	70,600,000	273,000	0.3%
Tuvalu	4,500	40,532	37,400,000	5,900,000	15.8%

Source: **FFA** (see: http://www.ffa.int/), Gillett and Lightfoot (2001)

a) Based on total commercial (non-subsistence) catch.

b) These estimates are based on official figures of the Fiji Fisheries Division. The Reserve Bank of Fiji estimates that these figures are $28,000,000. The EU estimates that these figures are closer to $40,000,000.

c) These are 1997 estimates for FSM.

d) Kiribati exports are dominated by live aquarium fish.

e) The bracketed estimates for PNG are based on the assumption that all access fees are paid only by off-shore foreign based vessels.

Although FICs only play a minor role in the fish-canning sector (due to the significant distance between these island countries and their principal markets), there are nonetheless several tuna canneries and loining plants located in a number of FICs that produce for a small number of principal markets, especially the EU and the US. There are two general types of models of FIC-based processing firm – those with integrated fishing-to-processing operations[22] and contract processors.[23] The margin of preference (24 per cent) that has been obtained through EU preferential market access arrangements has, historically at least, probably been the single most important factor governing the PACPs' focus on the EU market for canned tuna.[24] The total market share of EU

canned tuna imports from PNG increased from 2 per cent in 2002 to 5 per cent in 2005.[25] Solomon Islands resumed exports of canned tuna ('Solomon Blue') to the UK under the Cotonou preference in 2007, with the commencement of the Soltai Fishing and Processing Company operations.[26]

Apart from canned tuna, the PACPs also supply **loins** to the EU for processing. These exports have benefitted from Cotonou trade preference (subject to rules of origin or ROOs). Between January–June 2006, PNG exports of loins to the EU were 972.6 tonnes (t) (worth €3.07 million), and for Solomon Islands it was at 650t (€2.02 million). It is worth noting that domestic processing within the EU is likely to remain economically feasible only for as long as the margin of preference is maintained, the absence of which would lead to a possible shift in such production to lower-cost producers such as Thailand and Philippines. Fiji and PNG also export fish fillets and steaks to the EU. In 2005, the exports of this product totalled 34.5t and 50t respectively.

Philipson (2006) has suggested that a combination of fishing and domestic processing in the region would yield the highest net economic benefit (in terms of the profit made by a fishing operation and the wages of the crew). See table 9.4.

Table 9.4 Economic benefits of domestic tuna longline fishery for the Pacific region

Model	*Net local purchases*	*Employment earnings*	*Balance of payments*	*Gross profit*	*Government revenue*
Longliner – conventional	525	562	1,830	365	174
Longliner – foreign cannery	0	0	416	416	13
Value-added processing	602	201	1,364	602	46
Combined catching and processing	602	763	1,110	968	220
Foreign access longliner	0	0	350	n/a	350
	All values in US$ per tonne of tuna (catch or factory throughput)				

Source: Philipson, 2006: table 8

Under the Pacific ACP countries' EPA negotiations with the EU, their key interests have centred on: a) maintenance of existing EU market share, b) widening and deepening of this market share (i.e. through reform of EU rules of origin for fish and through the effective meeting of EU standards by PACPs who have yet to break into the EU market), and c) the need for development assistance.

On rules of origin (ROOs), the key considerations for the PACPs are that the rules must allow them the flexibility to expand and diversify their production base into the future (including through value addition). The region's concerns regarding ROOs are understandable, given that the ROOs provisions specifically relating to the **'Everything But Arms' (EBA)** initiative[27] and the Generalised System of Preferences Plus (GSP+)[28] were guaranteed only until 1 January 2010.

Global sourcing rules of origin have been provided to Fiji and Papua New Guinea in their Interim Economic Partnership Agreements (IEPAs) with the EU. The new rule here is that, regardless of where the fish is caught or the status of a vessel's flag, registration or ownership, the fish is considered as having originated from an ACP country and thereby qualifying for preferential treatment in the EU as long as it is transformed from being fresh or frozen into being a pre-cooked, packaged or canned product (categorised under HS 1604 and 1605). This is known as the change in tariff heading method, and was a core demand of the PACPs in their negotiations with the European Commission. In principle, these new ROOs are a huge step forward for PACP-based processors (mainly of canned tuna and tuna loins), but in practice the ability of processors to maximise the benefit remains to be seen. The most important limitation is the fact that fish still needs to meet

mandatory EU sanitary and phytosanitary measures (vessels must be registered and approved by the local competent authority, which is in turn regulated by the Health and Consumer Protection Directorate, better known as DG SANCO). The ability of PACPs to supply a range of fish and fish products that fulfil all EU import requirements remains a major challenge.

For the remaining PACPs, the least developed countries, namely Kiribati, Samoa, Solomon Islands, Tuvalu and Vanuatu, continue to benefit from the EU's Everything but Arms (EBA) regime, which offers similar preferences to Cotonou (apart from the provisions for sharing production processes among them or 'cumulation'). By contrast, Cook Islands, Tonga, Marshall Islands, Micronesia, Niue, Palau and Nauru have reverted to the less favourable GSP trade regime, which means a tariff increase of up to 20.5 per cent. However, because these countries currently export few goods, including fish, to the EU, they have not so far faced any significant commercial difficulties. For these five LDCs (whose fish exports currently benefit under EBA), and the seven other PACPs (whose fish exports currently qualify under GSP), the EC has indicated that new GSP rules will enter into force on 1 January 2010 (as regards the rules for determining origin) and 1 January 2013 (as regards procedures) respectively. It appears that those to be affected first by the new ROOs are likely to be the PACP non-LDCs that have not signed IEPAs.

Notwithstanding developments in the Pacific ACP–EU EPA negotiations highlighted above, it is notable that reservations have been expressed by some PACPs regarding regional co-operation and integration approaches in certain sectors like fisheries. Such reservations have been expressed particularly by those states that already have existing bilateral agreements with developed countries, which are part of the regional trade agreement (RTA) negotiations mentioned in this chapter.

At the WTO, four Pacific island countries have been engaged in the negotiations regarding proposals for expanded rules on fisheries subsidies. The region's stance reflects a concern that recently tabled disciplines would pose a direct threat to the region's artisanal and small fisheries sector. Through the WTO Doha Development Agenda (DDA) mandated Small Vulnerable Economies Work Programme (SEWP), the region has been actively involved in the Geneva process and stressing the need for WTO members to take account of the negative implications that any new discipline on fisheries subsidies could have for their artisanal fisheries sector. The debate, however, continues at the WTO about appropriately formulating defensive safeguard measures to promote the development artisanal sectors without necessarily creating **overfishing** or **overcapacity** in the sector. In addition, the interface between trade and climate change has also entered the international policy arena, which FICs will now have to address simultaneously in the United Nations and the WTO's negotiating process if they are to continually realise the opportunities emanating from globalisation.

If the current WTO DDA negotiations recommence, then efforts to multilaterally liberalise barriers to trade in fish and fish products are likely to result in dramatic changes to preferential arrangements between developing countries and their developed trade partners. A reduction in aid levels and devaluing of preferential arrangements between ACP countries and the EU, for instance, are likely to emanate from WTO non-agricultural market access (NAMA) and WTO rules negotiations on subsidies to the fisheries sector. Sectoral liberalisation, on the other hand, could eventually move the tariff levels to zero, resulting in increased competition among PIC exporters and an increased share of processing and production captured by lower cost Asian producers. The value of the preferences currently enjoyed by Pacific ACP fisheries exporters to the EU under the Cotonou Agreement, however, will nonetheless continue to be eroded through the proliferation of North–South and South–South regional trade agreements, particularly between more lower cost Asian fisheries producers and the EU and US (i.e. a US–Ecuador FTA, US–Thailand FTA etc.).

The most significant access arrangement in the South Pacific is the arrangement between the Pacific Islands and the USA,[29] which regulates access of US purse seine vessels in the EEZs of the South Pacific island states members of the Forum Fisheries Agency.[30] This arrangement currently provides approximately US$21 million per annum of annual returns to the beneficiaries, which is almost a third of the total access fees derived by the Pacific island states **but** less than 20 per cent of total distant water fishing nations (DWFN) catch in their EEZ.[31] Since 2000, there has been a dramatic decline in the number of US per seine vessels operating in Western Pacific waters, although discussions are currently being advanced among some US canning firms focussed on financing the rebuilding of the fleet.

The EU has also signed bilateral fisheries access agreements with Kiribati, which allows their **distant water fishing** purse seine and longline vessels to operate in Kiribati's EEZ. The agreement is heavily subsidised by an EU financial contribution set at €546,000 for the first year, corresponding to 8,400 tonne of tuna. Approximately 19 per cent of this contribution will be allocated to 'targeted measures' to support Kiribati participation in fisheries organisations and the country's institutional capacity. Seventeen per cent of the total cost of fisheries access under the agreement was met by ship owners, with the balance coming from EU public funds.[32]

The Forum island countries also have non-reciprocal preferential trade arrangements with Australia and New Zealand (ANZ) for all products, except sugar, under the South Pacific Regional Trade and Economic Co-operation Agreement (SPARTECA) – which is also subject to rules of origin. Despite this arrangement, FIC exports to Australia and New Zealand of fish and fisheries products have been relatively small. The current discussion in the region is now focusing on the possible negotiation for flexible SPARTECA ROOs for exports of fish and fish products, as well as garments into ANZ markets. The question that currently arises is how the region will move towards integrating the SPARTECA arrangements within the currently negotiated PACER Plus negotiations, and whether FIC market access arrangements with Australia and New Zealand, including rules of origin, will be improved.

Conclusions

The Pacific region undoubtedly faces major development challenges into the future. Most of the countries in the region remain severely hindered and constrained by their small size and remoteness. In particular, it is anticipated that there will be a decline in government revenues and increased competition in traditional markets for the regions' goods, as a result of erosion or loss of existing preferential market access arrangements. International trade including fisheries trade, however, continues to offer most small states in the region some of the best opportunities for delivering the growth and other performance improvements required, including at enterprise level, to address the multiple threats presented by poverty, high youth unemployment, environmental degradation and increased population pressures. In particular, studies have identified a number of areas, including improved harmonisation of fisheries access agreements, as being important for regional co-operation. The trade in services, including remittances received from migrants, are also expected to play an important role in the region's overall investment strategy.

Regionalism, incorporating regional co-operation and moves towards greater regional integration, offers some scope for delivering more competitive exports and market expansion, as well as for attracting new investment – by taking advantage of external economies of scale and through the establishment of more robust performance, including environmental, requirements.

There are some positive signs that leaders in the region have begun to respond to these realities. A Pacific Plan, which sets out a road map for the region, has been endorsed by the 14 small states known as the FICs (or PACPs). This commitment to closer working is, to some degree, reflected in ongoing negotiations with New Zealand and Australia – regarding possible amendments to SPARTECA, as well as deliberations around the anticipated Pacific Agreement on Closer Economic Relations (PACER Plus). In the case of the EPA negotiations with the EU, the FICs have co-operated closely in articulating a regional position regarding a development-oriented 'Managed Migration Scheme' to facilitate labour mobility priorities for the region.

Notwithstanding the progress that has been made towards greater regional co-operation by FICs, a number of obstacles clearly remain. Nowhere is this perhaps more evident than in trade negotiations that have a bearing on access to the region's fisheries resources. While key elements of the region's fisheries policy (e.g. Apia policy) are clearly reflected in the Pacific Plan, fisheries trade negotiations continue to be concluded bilaterally, as evident in the Fiji IEPA and the PNG IEPA as well as the enduring bilateral Fisheries Partnership Agreements between the EU and Kiribati, Solomon Islands, and the Federated States of Micronesia.

The success of the proposed temporary migration scheme, including at the bilateral level, will depend on strong, transparent and enforceable criteria and regulations that govern the entire process from the selection of candidates, their migration and employment in the receiving country right through to their return and successful reintegration in their home country.

Another potential obstacle to effective translation of the Pacific Plan into tangible outcomes is that a number of the initiatives identified for implementation are premised on development assistance being forthcoming. While commendable effort has been undertaken by the FICs themselves (e.g. studies and the pursuit of enhanced technical and vocational educational institutions) to create a more conducive domestic environment for trade and investment, it is clear that a significant level of external support and goodwill from the international community will continue to be necessary.

Important trading partners, such as the EU, New Zealand and Australia, will need to continue to be sympathetic to the particular circumstances of Pacific small states by working in co-operation with the FICs to ensure that their development opportunities are not unnecessarily hindered. This is not to suggest any endorsement for the continued existence of preferential market access regimes into perpetuity, but to highlight the important need for capacity building, including through the enhancement of local skills and knowledge, qualitative technology transfer and infrastructure development. It also requires trading partners to give adequate consideration to the potentially adverse impacts on the growth and trade opportunities on small states in the Pacific arising from the adoption of particular policies and the creation of unnecessary barriers to trade.

Clearly more remains to be done within the Pacific region to ensure that the expressed commitments to regionalism, as embodied in the Pacific Plan, are fully realised. A key demonstration of sustained political commitment of national governments to this 'new regionalism' will be required particularly in ensuring that they have coherent national development strategies in place that reflect the priorities set out in the Pacific Plan. In the case of fisheries, one of the key challenges will be to demonstrate how the adoption and implementation of an ecosystem approach to fisheries management is reflected in trade agreements negotiated by the FICs at bilateral, regional and multilateral levels.

References and bibliography

ADB (2002a) Kiribati. Monetization in an Atoll Society. Managing Economic and Social Change. Asian Development Bank report in consultation with the Government of Kiribati and with support from AusAID.

ADB (2002b) Tuvalu. 2002 Economic and Public Sector Review. Asian Development Bank report in consultation with the Government of Tuvalu and with support from AusAID.

ADB and Commonwealth Secretariat (2005) Towards a New Pacific Regionalism. Joint report to the Pacific Islands Forum Secretariat. See: www.adb.org and www.pacificplan.org.

Bertram, G (1999) 'The MIRAB model twelve years on'. In *The Contemporary Pacific* 11(1) 105–138.

Boland, S and B Dollery (2005) The Economic Significance of Migration and Remittances in Tuvalu. Working Paper Series in Economics No. 2005–10. Maine: University of New England, School of Economics.

Borovnik, M (2006) 'Working Overseas: Seafarers' remittances and their distribution in Kiribati'. In *Asia Pacific Viewpoint* 47(1) 151–161.

Briguglio, L, G Cordina, N Farrugia, and S Vella (2006) 'Conceptualising and Measuring Economic Resilience'. In L Briguglio, G Cardigan, E J Kisanga (eds.) *Building the Economic Resilience of Small States*. Malta: Islands and Small States Institute and London: Commonwealth Secretariat, pp. 265–87.

Brown, Richard and Adrian Walker (1995) 'Migrants and their remittances'. Pacific Studies Monograph No. 17. Armidale: Centre for Pacific Studies, University of New South Wales.

Carter, J (2001) Project to Upgrade the Maritime Training Institute. Draft report for the Government of Tuvalu and the Asian Development Bank.

Connell, J and R Brown (2005) *Remittances in the Pacific: an Overview*. Manila: Asian Development Bank.

Conway, J (2006) Tuvalu 2006 Economic Report: from Plan to Action (Final Draft). Prepared for Ministry of Finance, Economic Planning and Industries and the Asian Development Bank.

Gillett, R and C Lightfoot C (2001) The Contribution of Fisheries To the Economies of the Pacific island Countries. Pacific Studies Series, Asian Development Bank, World Bank, Forum Fisheries Agency, Secretariat of the Pacific Community, 218 pages.

Gorez, B and B O'Roidan (2002) A Report on the Future of European Union–ACP Fisheries Relations. London: Commonwealth Secretariat.

Graf, C V and Y Kamenasu (2006) Promoting Development in the Pacific ACP Countries through a Scheme of Temporary Labour Mobility. London: Commonwealth Secretariat.

Grynberg, R (2002) WTO Fisheries Subsidies Negotiations: Implications for ACP Fisheries Access Arrangements and Sustainable Management'. London: Commonwealth Secretariat.

Grynberg, R and V Qalo (2007) 'Migration and the World Trade Organization (WTO)'. In the *Journal of World Trade*, Volume 41, No.4.

North-South Institute (2006) Migrant Workers in Canada: A review of the Canadian Seasonal Agricultural Workers Program: Policy Brief. Available at: http://www.nsi-ins.ca/english/pdf/MigrantWorkers_Eng_Web.pdf [last accessed August 2010].

NZAID (2003) Support for the Kiribati Marine Training Centre; Feasibility Design Study. Study for NZAID by New Zealand Maritime School in association with Asia Pacific Maritime Institute.

Pacific Island Forum Secretariat (2005) A Pacific Plan – for Strengthening Regional Cooperation and Integration (Final Draft). Document for consideration by leaders at the Pacific Islands Forum meeting in October 2005.

Pacific Island Forum Secretariat (undated) Non-Paper on a Pacific ACP–EU Labour Mobility Scheme; Mode 4 and development in a PACP–EU EPA. Report on Economic Partnership Agreement Negotiations Pacific ACP–EC.

Philipson, Peter (2006) Development of tuna fisheries in the Pacific ACP countries (DEVFISH) Project. Pacific Islands Forum Fisheries Agency, November 2006. Also see http://www.ffa.int/ [last accessed August 2010].

Richard, B, and A Walker (1995) Migrants and their remittances, Pacific Studies. Monograph No.17. Sydney: Centre for Pacific Studies, University of New South Wales.

Secretariat of the Pacific Community (2008) Pacific Islands Regional Coastal Fisheries Management Policy and Strategic Actions (Apia Policy), 2008–2013. Also see http://www.spc.int/ [last accessed August 2010].

Scollay, Robert, and Gilbert, John (2001) *New regional trading arrangements in the Asia Pacific?* Washington, DC: Institute for International Economics.

Storey, D (2005) Pacific Migration and Development Desk Study. Paper commissioned by NZAID, June 2005.

United Nations (2008) Human Development Report. See: http://hdr.undp.org/en/reports/ [last accessed August 2010].

UNCTAD (2001) World Investment Report 2001: Promoting Linkages Overview. Geneva: UNCTAD.

Valsecchi, Adolfo (2006) Analysis of the Tuna Market at European and World-Wide Level. Paper presented at III European Conference of Tuna, Vigo 11-12 September. 2006.

World Bank (2006) 'At Home and Away: Expanding Job Opportunities for Pacific Islanders Through Labour Mobility'. East Asia and Pacific Region, Poverty and Economic Policy Unit. Washington, DC: World Bank.

Notes

1. World Trade Organization Document: WT/COMTD/SE/W/12: Small Economies submission to the WTO Committee on Trade and Development (CTD), providing indicative list of 17 specific characteristics and problems of small economies.
2. Ministers at the 2008 Forum Economic Ministers Meeting (FEMM) alerted the region to the emerging impacts of the global recession. The key points of pressure highlighted included lower prices and reduced demand for commodity exports, pressure on tourism, falls in remittance flows, significant falls in the value of offshore national trust funds and for some, a deterioration in access to finance.
3. See: http://www.pacificplan.org [last accessed 9 July 2010].
4. See: http://www.pacificplan.org [last accessed 9 July 2010].
5. See: http://hdr.undp.org/en/reports/ [last accessed August 2010].
6. See: http://wwwpacificeconomies.blogspot.com/2009/03/fiji-trade-deficit-widens-remittances.html [last accessed 9 July 2010].
7. IMF publication. See: http://www.imfstatistics.org/imf/ [last accessed August 2010].
8. UNCTAD (2001), table 6, p. 11.
9. ADB and Commonwealth Secretariat (2005), p. xxi.
10. Kalibobo Roadmap on the Pacific Plan (2006). Available at: http://www.pacificplan.org [last accessed 9 July 2010].
11. The Apia Policy, covering all 22 Pacific island countries and territories (PICTs) includes sustainable management of coastal fisheries, reducing their adverse impacts on coastal ecosystems, and optimising production to meet local nutrition needs and contribute to economic development.
12. See: www.ffa.org [last accessed 9 July 2010].
13. For example, World Bank (2006) and ADB (2002a).
14. The full Annex can be accessed from http://www.pacificplan.org [last accessed 9 July 2010].
15. For example, Fiji's NSDS only has three of the pillars: economic, social and environmental. It does not make any reference to the Pacific Plan, nor does it have any articulated policies on 'regionalism', although efforts are underway to 'dovetail' the Pacific Plan, the Mauritius Strategy (Mauritius, 2005a) and the Paris Declaration (Paris, 2005) into the country's development strategy. On the other hand, Niue's National

Integrated Strategic Plan (NISP), 2003–2005, covers four strategic objectives: economic, social, governance, financial stability and environment. It also has guiding principles that enshrine sustainable development in a very broad sense, and is currently working towards aligning its NISP for 2005–2008 with the strategic objectives of the Pacific Plan. Also see the Mauritius Strategy and Paris Declaration in http://www.un.org/esa/dsd/resources/res_pdfs/csd-18/csd18_2010_bp9.pdf [last accessed August 2010].

16. A number of countries have already expressed reservations about regional co-operation in certain sectors like fisheries, particularly those countries that have existing bilateral fisheries agreements with the EU.
17. **Kiribati** and **Tuvalu** currently have a seafarers' scheme through which Kiribati and Tuvaluan seafarers are employed on German and Asian merchant ships, as well as on Norwegian cruise liners. Approximately 1,250 seafarers from Tuvalu and 2,500 from Kiribati were registered in 2006. Contracts for seafarer merchants are negotiated directly between the shipping agencies in the sending and receiving countries, while the Kiribati and Tuvalu governments negotiate contracts for their caterers with the Norwegian Cruise Liners (NLC) shipping company.
18. North–South Institute (2006).
19. The logic being that if these developed countries agree to liberalising temporary movement of 'unskilled' service suppliers (TMNP) at the regional level through GATS Article V-type arrangements, then it would go beyond their currently agreed commitments at the multilateral level (which currently apply only to the movement of professionals). This would then send a political signal to other WTO members that they may be willing, in the future, to also multilaterally liberalise TMNP for 'unskilled' workers – which would benefit the developing countries that have a comparative advantage in the factor, but one which has largely been resisted by these developed countries.
20. Ibid.
21. FSM, Kiribati, Marshall Islands, Nauru, Palau, Solomon Islands and Tuvalu. It also has an agreement with Fiji, but Japanese vessels do not fish in Fijian waters.
22. RD Tuna Canners and Frabelle – both located in PNG and actively participating in the process of fishing to eventual sale to importing firms in principal markets, mainly the EU.
23. PAFCO (Fiji), Soltai (Solomon Islands) and South Sea Tuna Corporation (SSTC) (PNG) – primarily contracted processors that do not own the fish. Also FCF and TRI Marine supplies, procures and onward sales.
24. However, with PAFCO's switch to loining and the development of the SSTC loining plant in Lae to supply the US market (which does not apply a tariff of any significance on tuna loins), there is clearly **some** level of competitive advantage to tuna processing in PACPs.
25. Adolfo Valsecchi (2006).
26. Political tensions and the collapse of the world price of tuna during 1999 and 2002 had earlier forced the company to close. See: http://www.foodprocessing-technology.com/projects/soltaituna/ [last accessed 9 July 2010].
27. **Everything But Arms initiative (EBA)** offers duty-free market access to the EU for all states categorised by the UN as least developed countries for all their goods except for armaments and munitions (subject to rules of origin). The EBA is maintained under the legal framework of the Generalised System of Preferences.
28. **GSP Plus (or GSP+)** of the European Union works under the legal framework of the Generalised System of Preferences. The GSP Plus is a trade preference scheme offered to developing countries that are categorised by the EU as 'dependent and vulnerable' and that have signed up to 27 conventions on good governance, labour rights and the environment. The preferential treatment is subject to rules of origin.
29. 1987 Treaty on Fisheries between the Governments of Certain Pacific Island States and the Government of the United State of America (The US Treaty).
30. Parties to the multilateral treaty includes Australia, Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, New Zealand, Niue, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu.
31. Grynberg (2002), p. 12.

32. Ifremer, Cemare, CEP, (1999) Evaluation of Fishing Agreements is concluded by the European Community, European Contract No. 97/S 240-152919.10.12.1197 IFREMER/CEMARE/CEP Ref. ACPC02, quoted in B Gorez and B O'Roidan (2002), p. 17.

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Integrating Sustainable Development into National Frameworks

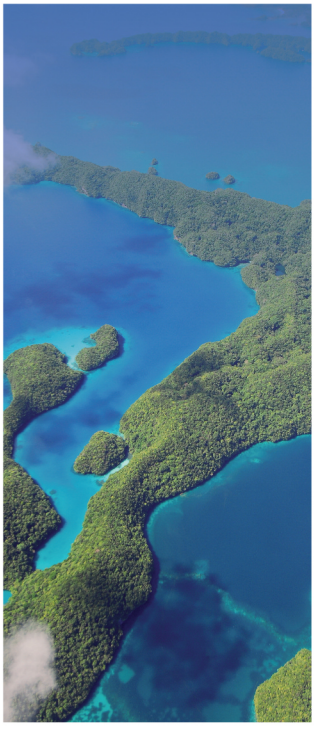
Policy Approaches for Key Sectors in Small States

This book brings policy-making for sustainable development into the mainstream of decision-making at all levels of governance and in all sectors.

It builds on the 2005 internationally agreed 'Mauritius Strategy' which aims to implement the integration of sustainable development by small island developing states.

Designed as a handbook for policy-makers and planners in government, as well as business and civil society leaders, it covers seven of the twenty issues that have been outlined in the Mauritius Strategy as being important for the sustainable development of SIDS – disaster management; marine resources; freshwater resources; land resources; energy resources; tourism resources and trade.

It brings together best practices, policy options and development prospects that small states can pursue in order to achieve real progress in these fields. It covers the progress and experiences of countries in the Caribbean region, the Pacific region, and the Atlantic, Indian Ocean and Mediterranean region in their implementation of sustainable development in these areas. It also provides a useful point of reference and stimulus to policy-makers and their supporting colleagues from all sectors.



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