

# Policy options

**This section aims to identify feasible policy options that target key components identified in the Causal chain analysis in order to minimise future impacts on the transboundary aquatic environment. Recommended policy options were identified through a pragmatic process that evaluated a wide range of potential policy options proposed by regional experts and key political actors according to a number of criteria that were appropriate for the institutional context, such as political and social acceptability, costs and benefits and capacity for implementation. The policy options presented in the report require additional detailed analysis that is beyond the scope of the GIWA and, as a consequence, they are not formal recommendations to governments but rather contributions to broader policy processes in the region.**

The policy options analysis aims to describe the habitat and community modification issues that need to be resolved or mitigated, and will describe alternative courses of action that may be taken by policy-makers in the Small Islands sub-system.

There has been progressive destruction and modification of habitats in the Small Islands sub-system, as a result of human activities including deforestation, land clearance for agriculture, tourism development, the introduction of alien species and urbanisation. Pollution has been caused by the modification of habitats, such as increased sedimentation following deforestation, but can conversely alter ecosystems from a multitude of sources. The region is particularly vulnerable to natural hazards such as hurricanes, sea level rise, flooding and volcanic eruptions, which frequently disturb habitats. These factors have degraded important aquatic ecosystems such as mangroves, seagrass beds and coral reefs, with associated environmental impacts, such as decreased species diversity and abundance, and socio-economic impacts, for example, a decline in the fisheries.

The Causal chain analysis identified the root causes of this habitat and community modification. It was found that rapid economic growth is the priority of the region's governments, which it has failed to balance with the conservation and protection of ecosystems, in order to achieve sustainable development. This can be attributed to institutional weaknesses that have facilitated a lack of cross-sectorial coordination and uncontrolled development of the coastal zone. Stakeholders are not involved during the planning and implementation of development projects, and therefore the needs of the local community are not considered. For example, there has been inadequate valuation of the essential income and nutritional benefits that habitats provide for local communities, prior to land clearance for development.

Regional conventions such as the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (the Cartagena Convention), Convention on Wetlands of International Importance Especially as Waterfowl Habitat, the United Nations Convention on the Law of the Sea, Convention for the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, among others (see also Annex IV), and national legislation related to these international agreements, aiming at managing natural resources, have not been entirely implemented due to the lack of capacity of enforcement agencies and management which is fragmented, with ill-defined and often conflicting responsibilities between government agencies and stakeholders. National laws related to the environment are not harmonised and there is an absence of integrated management of the coastal zone at the national and regional level. There is a lack of monitoring programmes and appropriate technologies to adequately assess the current, and predict the future, status of the ecosystems in the region, that would allow informed decision-making.

A fundamental hindrance to sustainable development is the lack of understanding, from the public to policy makers, of the importance

of conserving aquatic ecosystems. This may stem from unsatisfactory incorporation of environmental issues in educational curriculum, and the lack of public awareness programmes.

Political leaders and policy makers must be made aware of the linkages between considerations such as poverty, unemployment and environmental issues. As part of the development strategies, the small islands depended on monocultures, used fertilisers and pesticides, and became non-competitive with other countries which have more natural products offer. The consequences of these practices were evident in the economy collapse, that was resolved in a certain way with the tourism income. However, again there is a dependency developing on a single principle source of income, which will inevitably prove to be risky and potentially dangerous in the long-term. Additionally the environmental impact of tourism is not estimated in medium and long-term.

These practices have caused destruction of national habitats, alterations in water tables and flow regimes, increased levels of toxic chemicals and nutrients in drainage basins and coastal areas, and damage to coastal and marine habitats. Current attempts to relocate economies toward tourism inevitably results in other pressures. Moreover there is the need for land for development (particularly around coastlines) along with the demand for building materials and increased pressures on infrastructure and the environment (energy, waste disposal, food supplies, etc.). As a consequence, vitally important and sensitive ecological transition areas (mangroves, wetlands, river deltas and coastal hinterlands) are sacrificed to become development areas while rivers and coastlines are destroyed in the search for building materials. Basins are disrupted and water resources damaged and reduced.

In order to protect the marine biodiversity of the Small Islands sub-system, conservation must operate at the island-specific ecosystem level. There are selected narrower targets (e.g. endemic and endangered species) that warrant conservation attention. However, the most effective protection that will provide coverage for the greatest number of species will require an ecosystem approach. A combination of national and regional interventions will therefore be required to address the root causes identified by the Casual chain analysis. This is especially relevant for the Eastern Caribbean islands, which have: (i) a large number of geographically small ecoregions; (ii) relatively small number of locally and regionally threatened and endangered, unique or regionally endemic species, especially sparse in relation to the number of potential habitats or marine ecosystems; and (iii) especially high costs of land implying politically sensitive decision-making in the selection and management of protected terrestrial and marine areas.

## Policy option 1: Strengthening of resource management institutions

This policy option aims to design and implement a strategic plan, in order to strengthen the institutions, to harmonise the formulation and implementation of environmental policies, to ameliorate its human resource performance, and establish legal instruments for mitigating and reversing degradation trends in the Small Islands sub-system.

### Justification

A principal root cause identified for the Small Islands sub-system is the inability of governments to achieve economic growth whilst enforcing environmental policies (see Root cause: Inappropriate development



**Figure 17** Lesser Antilles.

*From bottom to top through the center are: Grenada, St. Vincent (with Barbados to its east), St. Lucia, Fort-de-France, Dominica, Guadeloupe, Montserrat (slightly west of center line), Antigua, and Barbuda.*

*(Photo: NASA)*

strategies). There is a need to recognise that some policies are compatible and some are conflicting and identify the trade-offs in order to harmonise development strategies.

A prerequisite to the successful design of a strategic plan is to address the Root cause of Insufficient data collection and management. Information is essential for informed decision-making and must be timely available to relevant policy makers, through information sharing networks.

The sustainable development of small islands is often hampered by the lack of appropriate data collection and management systems. In the absence of adequate data, decisions are made that may have irreversible consequences and that threaten the resource base over the medium to long-term. In accordance with the WSSD Plan of Implementation, paragraph 19 (WSSD 2002), to address the Root cause of Lack of understanding of environmental concepts, there is a need to “encourage relevant authorities at all levels to take sustainable development considerations into account in decision-making, including on national and local development planning”. In order to achieve this, capacity building is needed in relevant authorities so that they can utilise data management services.

### **Actions at national level**

- Promote professional training of personnel responsible for the formulation and implementation of relevant policies to harmonise economic growth and natural resource use.
- Encourage dialogue between enterprises and the communities in which they operate and other stakeholders (WSSD 2002, Paragraph 18b).
- Design and implement, with the participation of all the stakeholders involved in coastal zone management, a coastal and marine management plan. This would take a cross-sectorial approach to the development of economic activities.
- Harmonise state policy regarding marine and coastal resources management, to clarify institutional functions and to identify gaps in legislation.
- Incorporate ratified conventions and international agreements into the national legal framework.
- Establish legal borders of protected areas (see Root cause: Lack of enforcement).
- Promote public awareness and education; incorporate general environmental issues into the formal education system, and public educative campaigns through the media.
- In accordance with WSSD (2002) paragraph 58g the sub-system should develop community-based initiatives on sustainable

tourism and build the capacities necessary to diversify tourism products, while protecting culture and traditions and effectively conserving and managing natural resources.

### **Actions at regional level**

- Reach an agreement among the governments in the Small Islands sub-system, for the creation of special protection areas and development areas.
- Update regional cooperation agreements between the countries with a view to ensuring sustainable management of the international waters of the Small Islands sub-system.
- Reform and establish new institutional mechanisms for cooperation and consultation so that aquatic resources can be a catalyst for balanced regional development. For example, the sharing of information and best practices for the management and planning of the region’s protected areas.
- Rehabilitate and develop a permanent network, to monitor water, the environment and the way they are exploited, and to provide better knowledge of the way in which the hydro systems function.
- Initiate an agreement for international environmental standards regarding effluent discharges and water quality (both marine and freshwater).
- Design and implement data collection and management system to make informed planning and management decisions. Essential links should be created between research programmes, biodiversity programmes, the fight against habitat degradation and modifications in international waters. This should include the further use of Geographic Information Systems (GIS) in coastal zone management.
- Promote and facilitate at the national level and regional level the ratification/accession to the Cartagena Convention and its protocols; the Oil Spills Protocol, the Specially Protected Areas and Wildlife (SPA) Protocol and the Protocol on Land-Based Sources.

### **Actions at global level**

To implement with special emphasis World Summit on Sustainable Development (WSSD 2002) from recommendations according to the Framework for Action on Biodiversity and Ecosystem Management, especially:

- Building capacities and technology sharing and scaling up outstanding examples of best practices of rural communities throughout the developing world.
- Building capacities at the local level and empowering local communities to take action as it is at the local level where stress on biodiversity occurs.

- Building partnerships among governments, business, farmers, and local communities as this is the best way to mainstream biodiversity concerns into economic and social activity.
- Look for international cooperation sources that support the establishment of natural resources control and monitoring teams.
- Identify networks of scientific information exchange about natural resources rational use.

## Performance of the policy option

### Effectiveness

#### *Option impact*

The policy option directly addresses the root causes of inappropriate development strategies and insufficient collection and management of data, by strengthening the capacity of regional and national institutions, and initiating the collection, management and exchange of data. This will allow the design of a strategic coastal management plan.

The primary regional benefits of the option would be stronger institutions for the decision making process at the regional, national and local level. This should result in coordinated decision making, local communities more empowered to manage their environment and effective mechanisms to implement regional policies at the local level for managing natural resources and reversing the trend of habitat degradation.

Institutional strengthening will encourage inter-sectoral harmonisation of economic and environmental policies, thereby facilitating sustainable development and better preparing the islands to attract donor support and investment. There will be improved coordination and environmental planning as the mechanisms established will allow the harmonisation of economic activities and the enhancement of human resources should give rise to the effective implementation of further environmental initiatives. A strategic development plan will enable the countries of the Small Islands sub-system to evaluate, on a continuous and scientific basis, the breakdown of costs, benefits and environmental impacts of proposed development works.

This policy will open dialogue between authorities and communities through a stakeholder participatory process, which will involve communities in monitoring and management of natural resources. Stakeholders will be actively encouraged to participate through links to national institutions that will bring them into the decision-making process.

#### *Result if positive conditions*

The results are: (i) plan for institutional, human, and legal strengthening; (ii) national planning in coastal and marine zone; (iii) regional planning in coastal and marine zones; (iv) greater participation of stakeholders including the economic sectors and civil society in decision-making, through more efficient communication mechanisms; (v) monitoring and control networks; (vi) versatile information systems, in agreement with society demands; (vii) improved population awareness of the need to conserve natural resources; (viii) harmonisation of legal instruments at national level; (ix) harmonisation of legislation at regional level; (x) establishment of protected areas enforced by legislation; and (xi) strategies for human resource training.

#### *Success probability*

The governments have shown a commitment to sustainable development, and have now began to realise the necessity of preserving their environment especially for the success of tourism which has become increasingly important in the region. It is therefore anticipated that there will be greater willingness to incorporate environmental policies in national agendas and implement the principles outlined in the policy option. However, there are many difficulties and it is unknown whether governments will forfeit short-term economic gains for sustainable development. Periods of economic instability may jeopardise public and political commitment to such a policy option, as poverty and unemployment forces the population to exploit resources at an unsustainable rate for their short-term survival. There will be a need to work within existing regional mechanisms to ensure long-term capacity to harmonise national policies at the regional level. The success probability is moderate, due to obstacles, risks and difficulties.

#### *Obstacles and risks*

The principal risks and obstacles to fulfilling the aims of this option are: (i) difficulty in harmonising inter-institutional environmental and economic policies; (ii) coordination of diverse institutional functions; (iii) lack of political will to harmonise plans and projects; (iv) information availability; (v) deficient communication channels at local, national and regional levels; (vi) difficulties in making national legislative and regulatory changes in order to harmonise at the national and regional level; (vii) financial feasibility; and (viii) willingness of all stakeholders to participate.

### Efficiency

#### *Benefits*

The benefits of the policy option will be: (i) improvement of environmental goods and services management and control, as

consequence of strong institutions; (ii) development of participative democracy in the decision-making process; (iii) efficient and efficacious harmonisation of national and inter-sectoral public policies; (iv) population more environmentally aware; and (v) greater capacity in institutions for improved decision making at all levels.

#### *Costs*

Financial costs will be incurred from the: (i) professional improvement programmes; (ii) harmonisation of national legal instruments; (iii) design and development of environmental monitoring and control networks; (iv) design and development of information systems, data bases and GIS; (v) construction of national and regional coastal zone management plans; (vi) development of environmental education programmes and use of the media; and (vii) analyse institutional functions and capacity.

#### *Benefits and costs quantitative estimations*

There are some references about that on other studies funded by UNEP, Inter-American Development Bank (BID), World Bank and GEF.

### **Equity**

#### *Net winners and losers*

Winners are the Caribbean, the region's states and inhabitants of the region as a result of an enhanced quality of life and the long-term security of environmental goods and services. Losers are sectors that unsustainably exploit resources and degrade the environment for their short-term benefit, for example, some agro-business and tourist enterprises.

#### *Funding*

The national governments at all levels, the sectors involved on environmental resources management and international organisations interested in environment preservation.

#### *Justification of selected options*

The option's benefits have high possibilities of being higher than the losses since one of the principal root causes of environmental damage in the Small Islands sub-system is weak governance, related to weak institutional capacity for an adequate organisation of sustainable development environmental and economical policies. It is predicted that the benefits provided following the successful implementation of the policy option would justify the economic costs. Strengthening the capacity of institutions is a prerequisite for implementation of further initiatives, will enable effective management of natural resources and will move the region towards more sustainable development. There should be a high return on

capital invested in the medium to long-term, as economic activities will be stimulated, particularly tourism, as a result of a healthier ecosystems.

#### *Compensation instruments*

Compensation instruments must be applied in the case that environmental restrictions severely affect employment or inhabitant's income in the area (as in the case of agriculture and tourism industries). In that case, the possibility to establish professional and technological cooperation programmes should be studied.

### **Political viability**

#### *Net allies and opponents*

Groups that are likely to support the policy instruments include: base communities, non-governmental organisations, international organisations, state entities (Martinique, Water Society of Martinique; Monserrat, Monserrat Water Authority and the Land Development Authority; Netherlands Antilles, Ministry of Development and Cooperation; Saint Kitts and Nevis, Ministry of Communications Works and Public Utilities; St Lucia Ministry of Tourism, Mobilization and Public Services; Water and Sewerage Authority; Ministry of Planning, Personnel, Establishment and Training; St Vincent and Grenadines, Ministry of Health and the Environment, Ministry of Agriculture, Industry and Labour, Central Water and Sewerage Authority, the Physical Planning and Development Board; Trinidad and Tobago, Ministry of Planning and Development, Ministry of Food Production and Marine Exploitation, Water Sewerage Authority; Antigua & Barbuda, Ministry of Tourism and Environment, Development Control Authority; Aruba, Aruba Water Agency; Barbados, Barbados Water Authority; Turks & Caicos, Departments of Water Supply and Environmental Health)

Opponents are: economic sectors, farmers, fisheries, and tourism enterprises. They come from powerful economic sectors, especially farmers, that have not taken into account exploitation costs in the productive processes; their fear is probably related to the increase of their final product price when they assume the exploitation costs, situation that could decrease their competitive capacity in markets where consumers do not care about environmental degradation, and some enterprises of tourism and mining.

It is possible that some actions to obstruct the development of these initiatives may be taken through political influence, since the options implementation needs investment, political will and awareness, as well as public administration changes.

#### *Possibility to implement the instrument*

There are presently institutional arrangements for the land-use management at the national level, which the policy option could be implemented through. However environmental management is fragmented between many institutions within each country, without a single institution to act as a focal point. Institutional reform may be necessary, which may not be politically feasible.

#### *Conflict resolution*

It is necessary to guarantee the participation of all stakeholders involved in coastal activities and to design conflict resolution mechanisms. Through a consultative process with relevant stakeholders a regional coastal management plan can be formulated.

#### **Management capacity**

##### *Capacity and resources to develop the recommendation*

The Caribbean Community and Common Market (CARICOM) is the principal regional programme to facilitate this policy option. In addition, some countries have programmes based on sustainable development principles, for example, in Barbados, mining activities are being regulated and renewable energy technologies developed. These programmes can be used to promote the compatibility of economic growth and environmental protection to other countries in the region.

##### *Capacity building requirement*

The islands need: (i) better understanding and application of sustainable development by state personnel and local communities; (ii) more inter-institutional coordination is needed at national and regional level to determine control and management measures; (iii) enhanced mechanisms for civil society participation in decisions-making; (iv) personnel training in monitoring and data management; and (v) improvements in dissemination and availability of scientific research.

##### *Political commitment*

Governments must remain committed to achieving sustainable development by withstanding pressures from industrial sectors lobbying for fewer environmental regulations and not being deterred by the capital investment required.

## **Policy option 2: Strategic regional plan for integrated coastal and marine management**

This policy option aims to formulate and implement a Strategic Regional Plan of Integrated Coastal and Marine Management, to allow and support the combination and execution of different planning forms that include physical, environmental, socio-economic, administrative and land use planning, ensuring the environmental stability.

#### **Justification**

There are close inter-linkages between marine ecosystem management and overall land and water use planning and development for small islands. Coastal and marine management therefore needs to integrate land and water use policies and management including land tenure and rights of access, appropriate zoning based on land capability, implementation of coastal zone management plans and policies, carrying capacity assessments, determination of limits of acceptable change for critical marine ecosystems, legal demarcation of marine reserves and protected areas, and restoration and/or enhancement of critical terrestrial and coastal habitats.

The planning and implementation of a Strategic Regional Plan for Integrated Coastal and Marine Management, will require institutional capacity building, training and improved information technology/ data collection and analysis for natural resources management, greater stakeholder participation from planning to implementation, and greater consideration of the real value (economic valuation) of coastal and marine resources to social and economic development. It is therefore recommended that Policy option 1: Strengthening of resource management institutions be implemented before a Strategic Plan is created.

In this policy option a more integrated approach to national development planning will be required; involving all relevant sectors and stakeholders as the primary tool to achieve sustainable development for the Caribbean Small Islands. It is recommended that mechanisms be put in place to rationalise and harmonise the existing institutional, policy and legislative instruments relevant to the management of marine ecosystems within and across sectors. This will require a more integrated approach to national development planning involving all relevant sectors and stakeholders as the primary tool to achieving sustainable development for Caribbean Small Islands.

## Actions at local level

- Consult all stakeholders: public sector, private sector, NGOs and civil society to formulate national long-term vision, objectives and goals for sustainable development.
- Identify most appropriate mechanism(s) for integration and coordination of sector policies, programmes and plans.
- Design and implement a comprehensive land and water resource management policy.
- Promote the registration of land ownership, tenure and rights of access especially on the use of coastal lands and on the conservation of protected areas on private lands.
- Develop appropriate incentives and coordinating mechanisms to facilitate co-management of resources especially those requiring protection that are located on private lands.
- Develop methodology for prioritisation of policies, projects and plans – need for training in policy analysis.
- Encourage legal demarcation of marine reserves and protected areas.
- Create further public awareness and education programmes at all levels.
- Ensure a high level of political endorsement and ministerial commitment.
- Establish permanent national coordinating committees and appropriate technical sub-committees e.g. National Sustainable Development Councils. This committee should have a specific legal mandate to coordinate the Integrated Development Planning (IDP) process.
- Conduct/update policy and legislative evaluations of sector policies and strategies to identify gaps, overlaps and conflicts as well as laws and regulations to update and harmonise as appropriate.
- Identify, as appropriate, at the national level, alternative economic livelihoods, technologies, methods and practices to those that presently impact negatively on the coastal and marine environment.
- Formulate National Sustainable Development Strategies (NSDS) to guide future sector policy development and ensure integration of sector activities based on vision, long-term objectives and immediate priorities.
- Develop and apply vulnerability indices for Caribbean Small Island states.
- Support ratification and effective implementation of the Land-Based Sources of Marine Pollution protocol of the Cartagena Conventions by all countries of the Wider Caribbean Region (specific barriers to implementation such as policy, institutional, technical, legal, and capacity building requirements would have to be addressed at the national and/or regional levels).

- Meet obligations of other relevant regional and international environmental agreements including MARPOL 73/78 Convention, BASEL Convention on Hazardous wastes, London Dumping Convention, Cartagena Convention and the Specially Protected Areas and Wildlife (SPA) and Oil Spills Protocols, and the IMO Civil Liabilities and Fund Convention. (Specific barriers to implementation are: Policy, Institutional, Technical, Legal; and capacity building requirements would have to be addressed at the national and/or regional levels).
- Establish linkages and be complementary to existing projects such as the GEF Caribbean International Waters project on Integrating Management of Watersheds and Coastal Areas in Small Island Developing States in the Caribbean and the proposed GEF/OECS Biodiversity project on Sustainable Livelihoods.

## Actions at regional level

- Identify appropriate regional economic, environmental and social indicators of sustainable development.
- Produce a register of institutions and human resources concerned with environmental and coastal management.
- Strengthen spatial decision making systems i.e. the use of GIS, satellite imagery etc. in assessing land capability, land zoning, and pollution impacts including changes in the coast line and identifying limits of acceptable change for selected coastal and marine resources.
- Identify and map areas of high risk for development because of the potential impact on coastal and marine habitats and ecosystems.
- Conduct a comprehensive inventory of, the type, location, extent and status of marine resources and analyse the impacts of coastal activities. These parameters should be incorporated into a GIS to be utilised in the decision-making process.
- Develop and/or strengthen sub-regional and regional monitoring and enforcement mechanisms to detect incidences of pollution and/or habitat modification e.g. Caribbean Port State Control.
- Develop and/or strengthen sub-regional and regional mechanisms for data gathering, compilation, analysis and sharing of information on pollution incidents, maritime traffic and damage to coastal and marine ecosystems between countries of the region.
- Support ongoing efforts to conduct regional/sub-regional assessments and inventories of the type, location, extent, status and potential threats to existing coastal and marine biodiversity and ecosystems. This should include development of environmental sensitivity mapping of these areas and an assessment of the economic value of these resources to the region.
- Conduct public awareness and education programmes at all levels.

- Assure effective implementation of the obligations of relevant conventions and protocols such as the Land-Based Sources of Marine Pollution Protocol (LBSMP) of the Cartagena Convention and improved compliance, will be an effective mechanism for controlling transboundary impacts including the discharge of untreated sewage and other non-point sources of pollution from continental land masses.
- Strengthen Agenda 21 commitments, Chapter 36 related to public participation.
- Promote and facilitate at the national level and regional level the ratification/accession to the Cartagena Convention, the Oil Spills Protocol, the Specially Protected Areas and Wildlife Protocol and the Protocol on Land-Based Sources.
- Implement with special interest the World Summit on Sustainable Development (WSSD 2002) recommendations, paragraphs 73 and 74. Paragraph 73 recognises the importance of regional actions towards sustainable development and takes into account the region's singularities, shared visions and cultural diversity. It is targeted towards the adoption of concrete actions in different areas of sustainable development, such as biodiversity, water resources, vulnerabilities and sustainable cities, social aspects, including health and poverty, economic aspects, including energy, and institutional arrangements, including capacity-building, indicators and participation of civil society, taking into account ethics for sustainable development. Paragraph 74 envisages the development of actions among countries in the region that may foster south-south cooperation and may count with the support of groups of countries, as well as multilateral and regional organisations, including financial institutions.

### **Actions at global level**

- Support implementation of sub-regional and regional sustainable development policies such as Organization of Eastern Caribbean States (OECS) St. George's Declaration of Principles of Environmental Sustainability and Barbados SIDS Program of Action. This Declaration constitutes the basis of the relations of peace, friendship and cooperation between Dominica, Grenada and Saint Lucia, regarding different subjects related to the Caribbean region. Appropriate regional agencies and mechanisms should be created and/or strengthened to facilitate this.
- Support the proposal by Caribbean countries to the United Nations to declare the Caribbean Sea as a Special Area in the context of sustainable development.

## **Performance of the policy option**

### **Effectiveness**

#### *Option impact*

This policy option could have a high impact since it is related to one of the principal needs of the small islands: to make a general management plan that allows to organise economical activities and define environmental protection areas on the basis of a legal framework. Additionally, the establishment of such a plan will clearly define the responsibilities of the relevant authorities and the principal mechanisms to coordinate the formulation and implementation of policies. Finally, this option will embrace public participation and consultation in decisions-making.

#### *Result levels on positive, normal and negative conditions*

The results are: (i) regional strategic plan for marine and coastal resources management; (ii) efficient land and water resource management policies; (iii) efficient co-management of resources; (iv) legal demarcation of marine reserves and protected areas; (v) increased stakeholder participation; (vi) development of clean technologies; (vii) system for data collection; and (viii) control and monitoring networks.

#### *Success probability*

The success probability is moderated, due to the obstacles, risks and difficulties noted below. For the policy option to be successful many of these difficulties will have to be addressed, and trade-offs made, through a consultative process.

#### *Obstacles and risks*

The obstacles and risks are: (i) difficulties in integrating the political interests and diverse socio-economic and environment characteristics of each country in the region; (ii) potential conflicts among national stakeholders involved in natural resources management, as well as among the environmental authorities of the region; (iii) limited economic resources; (iv) complex design of inter-sectorial efficient coordination mechanisms at local and regional levels; (v) fragmented and limited legislation; (vi) lack of information regarding natural resources and the status of ecosystems; and (vii) limited technological capacity for environmental resources monitoring and management.

### **Efficiency**

#### *Benefits:*

The benefits are: (i) a decrease in further habitat modification; (ii) greater sustainable use of resources; (iii) sustained economic development; (iv) development of participative democracy; (v) efficient and efficacious harmonisation of national and inter-sectorial public policies; (vi) improvement of the sub-regional integration and resources

optimisation; and (vii) legal harmonisation of instruments and definition of institutional competences and responsibilities among political institutions involved in natural resources management and control.

#### *Costs*

The costs are: (i) design and implementation of Strategic Regional Plan for integrated coastal and marine zones management; (ii) design and development of educative campaign for public awareness; (iii) design and development of information systems, and data bases; and (iv) use of GIS, satellite imagery, etc.

#### *Quantitative estimations of benefits and costs*

There are some references about projects funded by the Biocommerce Initiative of UNCTAD (Los Andes Promotion Corporation), the Andes Promotion Corporation, among others. The Biotrade initiative was launched by UNCTAD during the third Conference of the Parties (COP III) of the Convention Biological Diversity in Buenos Aires on 1996. Its objective is to stimulate trade and investment on biological resources driving sustainable development. With this aim, Biotrade is looking for to ameliorate underdeveloped countries' capacity on biodiversity sustainable use, trading new goods and services, with more aggregated value for national and international markets (IAVH 2000).

#### **Equity**

##### *Winners and losers*

Winners are the involved states and the communities that participate in the projects. Losers are sectors not making investments in green products since they will have less income if green products become more desirable, sectors that exploit the resources unreasonably, traditional producers, agricultural products producers, tourism and mining enterprises.

##### *Funding*

The national governments at all levels, communities, private sectors involved in the sub-system's environmental resources, and international organisations interested on environment preservation and promotion of green markets.

#### **Justification of the selected option**

The principal advantage of adopting this policy option is that it gives more possibilities of environmental resources conservation, since it integrates marine and coastal resources management in one plan, which is the principal tool to clearly establish governmental stakeholders competences involved in natural resources management and control. In the same way, through a regional plan there is optimisation of resources, especially monitoring technologies and human resources. In this kind

of plan there is active civil society stakeholders participation, then, this option supports democratic participation processes strengthening.

#### *Compensation instruments*

Considering that it is possible to have a socio-economical impact, the policy can study the possibility to train the communities on use and research of cleaner technologies, in order to find more competitiveness in green markets. The compensation instruments facing a possible socio-economical impact of using and trading green products, could include stakeholders training to be more competitive in the new market of green products; there could be also training on use and research on cleaner technologies to complement the offer of green products; governmental funding for green products and green markets is another possibility.

#### **Political viability**

##### *Net allies and opponents:*

Groups that are likely to support the policy instruments include: base communities, non-governmental organisations, international organisations, State entities (Martinique, Water Society of Martinique; Monserrat, Monserrat Water Authority and the Land Development Authority; Netherlands Antilles, Ministry of Development and Cooperation; Saint Kitts and Nevis, Ministry of Communications Works and Public Utilities; St Lucia Ministry of Tourism, Mobilization and Public Services; Water and Sewerage Authority; Ministry of Planning, Personnel, Establishment and Training; St Vincent and Grenadines, Ministry of Health and the Environment, Ministry of Agriculture, Industry and Labour, Central Water and Sewage Authority, the Physical Planning and Development Board; Trinidad and Tobago, Ministry of Planning and Development, Ministry of Food Production and Marine Exploitation, Water Sewage Authority; Antigua & Barbuda, Ministry of Tourism and Environment, Development Control Authority; Aruba, Aruba Water Agency; Barbados, Barbados Water Authority; Turks & Caicos, Departments of Water Supply and Environmental Health)

Opponents are: economic sectors, farmers, fisheries, enterprises of tourism. Affected are economical sectors, such as agriculture, mining, fisheries, and enterprises of tourism.

It is possible that some actions to obstruct the development of this initiative may be taken, through political and economical influence.

##### *Possibility to implement the instrument*

Studies in the region have reported the need to establish a hydrological and land regional management plan (CATHALAC 1999). Furthermore, the experts of the small islands have observed that Integrated

Management of Coastal and Marine Zones could be a good strategy for ameliorating resources administration and conservation.

#### *Conflict resolution*

To avoid disputes and resolve conflict: (i) awareness campaign to increase involvement of stakeholders in the design of the strategic plan; and (ii) a consultative process where stakeholders can voice concerns.

#### *Result if positive conditions*

At the political level it is expected that the plan will integrate the islands' coastal and marine management policies. At the sub-regional level, better coordination for efficient implementation of regional marine and coastal environmental policies. At the environmental level reduction in environmental degradation is expected, through change of agricultural, mining and tourism sectors that offer sustainable environmental goods and services. At the socio-economic level better income and better socio-economic development.

#### *Management capacity*

Capacity and resources required to develop the recommendation: (i) establish a data base to identify human and institutional personnel that is in charge in each island of marine and coastal resource regulation; (ii) ameliorate the quality of the information systems related to resources control and monitoring; (iii) further sustainable production initiatives to reduce poverty levels; and (iv) design inter-institutional and inter-governmental coordination mechanisms.

#### *Required institutional reforms*

(i) Develop appropriate incentives and coordinating mechanisms to facilitate co-management of resources; (ii) more inter-institutional coordination is needed at national and regional level to determine control and management measures; (iii) enhanced mechanisms for civil society participation in decisions-making; (iv) human resource training for improved monitoring, data management and implementation of plan; and (v) greater dissemination and accessibility to scientific research.

#### *Political commitment*

Lack of political interest on the need to preserve natural resources and to take necessary action to make it; little financial resources to cover the costs of the policy; different systems of government and public administration that could affect the efficiency of intergovernmental coordination mechanisms.

The policy option will require significant political commitment from all of the region's countries. This may prove problematic as there the policy

requires considerable investment, and the countries of the region have various political and legislative frameworks regarding the environment which may prove difficult to integrate.

## Conclusions

Although this section made only a preliminary analysis of conceptual ideas and actions, it is considered that both policy options are promising. It is evident that the countries of the region are finding it difficult to harmonise the need for economic growth with the protection and conservation of their limited resources. The implementation of Policy option 1 will build capacity in relevant institutions, in order to better implement environmental policies and establish legal instruments for mitigating and reversing degradation trends in the Small Islands sub-system. This will promote sectoral harmonisation in the management of natural resources.

Policy option 2 aims to create a Strategic Regional Plan for Integrated Coastal and Marine Management. Integration of environmental management at the regional level would mutually benefit all of the countries in the sub-system, due to the transboundary nature of many environmental problems. The plan will organise economic activities and define environmental protection areas on the basis of a legal framework. The responsibilities of the relevant authorities and the principal mechanisms to coordinate the formulation and implementation of policies will be defined in the Strategic Plan. The use of environmental management resources will be optimised, through the sharing of information, human resources and monitoring techniques.

It is recommended that more detailed analysis be undertaken in order to develop the policy options further. It is anticipated that by addressing the root causes identified in the Causal chain analysis through the implementation of these policy options, the management of the region's aquatic resources will be significantly enhanced.