Report of the Alliance of Small Island States' Meeting of Experts on Waste Management for Small Island Developing States: Enhancing cooperation among SIDS for their sustainable development

Held at Hotel Nacional, Havana (Cuba), 27 October to 1 November 2003

ADDRESSING THE CHALLENGES OF WASTE MANAGEMENT IN SIDS

1. INTRODUCTION

The Meeting of Experts on Waste Management for Small Island Developing States (SIDS) was held at Hotel Nacional, Havana (Cuba). It brought together experts from all SIDS regions and from a variety of backgrounds, such as government trade officials and representatives from educational institutions, waste management, private business and non-governmental organizations (NGOs). A large contingent of local participants also attended the sessions. The United Nations Development Programme (UNDP) provided substantial financial and technical support.

The opening ceremony was chaired by Joaquín Gutiérrez, Ministry of Science, Technology and Environment (CITMA) and chairman of the Organizing Committee. He welcomed Dr. Thomas Goreau who made a special presentation on waste management and the impacts on the coral reef.

Professor Albert Binger, Director, Centre for Environment and Development, University of the West Indies, delivered the keynote address. He noted that the purpose of the meeting was to bring current information on waste in all its permutations, and that this was an important aspect in helping SIDS understand their overall vulnerability.

The meeting then heard an address by Bruno Moro, Resident Representative of UNDP, who welcomed the participants to Cuba and officially opened the meeting.

At the closing ceremony, Jorge Mario García Fernández, Director of CITMA, thanked the participants for their efforts, noting that all SIDS, from the smallest to the largest, have a right and a duty to contribute to discussions on sustainable development. He commended the report of the meeting and presented each participant with a personal diploma.

The meeting requested the Government of Cuba, through the Ministry of Science, Technology and Environment, to submit the report to the United Nations Secretary-General for circulation as a UN document under the item relating to the International Meeting to review implementation of the SIDS/Barbados Programme of Action.

2. PROCEEDINGS

Presentations were made by Nicole Baker, Julia Brown, Liuba Chabalina, Jesús Delgado, Denise Forrest, Edison Garraway, Thomas Goreau, Velva Lawrence, Jorge Alfonso Ordás, Rolph Payet, Hugh Sealy, Vincent Sweeney, Randolph Thaman, Teresa Manarangi-Trott and Allen Zack. Their presentations and their case studies will be available from SIDSNet (www.sidsnet.org). Discussions were held on the presentations, and special attention was also given to the situation of waste management in Cuba. The discussions were far ranging, and the sections below attempt to synthesize the main points and major conclusions.

3. BACKGROUND

Preparations for the 10-year review of the SIDS/Barbados Programme of Action (BPoA) in Mauritius in 2004 are well under way. It was recalled that at the Global Conference on the Sustainable Development of Small Island Developing States (SIDS) in Barbados in 1994, the international commitment to sustainable development that had been articulated two years earlier in the Rio Declaration on the Environment and Development was further concretized into the Programme of Action for the Small Island Developing States.

A principal focus of the BPoA was the deepening of the understanding of vulnerabilities of SIDS with a view to managing these vulnerabilities in ways that are consistent with their sustainable development. Today, the discussion within the Alliance of Small Island States (AOSIS) is focusing on the building of resilience, both as a practical step towards sustainable development, while at the same time seeking to manage vulnerability and exposure.

The International Meeting that is being organized in Mauritius in 2004 to review progress in implementing the BPoA represents another major opportunity for SIDS to reiterate to the international community the challenges they encounter in their efforts to attain sustainable development. The requests for international cooperation in the building of resilience in SIDS are expected to come against the background of assessments of the achievements in implementing the BPoA in the past 10 years as well as in recognition of the new challenges SIDS face in engaging successfully with the rapidly changing global economy and the changes in the global climate.

Lessons of past preparatory processes – the United Nations General Assembly Special Session on HIV/AID (UNGASS) on SIDS, the ninth session of the Committee on Development (CSD9) and the World Summit on Sustainable Development (WSSD) – have been drawn on to make the current process as efficient as possible and allow for maximum participation of stakeholders or their representatives. One such lesson is that information on the implementation of the BPoA must be researched and packaged to inform broad stakeholder participation in national and regional discussions. Clearly, we as SIDS must be better prepared and focused if the International Meeting is to be a success. The level of preparedness and the availability of key information to the negotiators will be crucial.

Although waste management was one of the priority areas of the BPoA, no elaborated strategy was developed to help guide SIDS in the implementation of sustainable waste management systems. Consequently, waste management is now emerging as a major concern for SIDS as the consequences become manifest. It is therefore an urgent necessity for SIDS' waste management experience to be studied, in order to identify approaches that are more socially equitable, less costly to operate, more environmentally friendly and less demanding on the limited land resources.

This expert meeting was therefore organized with support from UNDP Capacity 2015 to bring together a cross-section of representatives across SIDS to assess the experience with waste management, to make an assessment of the current situation and to identify actions and associated strategies that are needed to address this growing area of vulnerability for SIDS.

4. THE CURRENT WASTE MANAGEMENT SITUATION IN SIDS

Wastes are inevitable by-products of biological life, which requires material and energy flows through living organisms. Accordingly, the biosphere has many integrated biodiversity-rich ecosystems in which one creature's waste often becomes the food for another, facilitating the dispersal and disposal of naturally occurring wastes. Consequently, when ecosystems are in balance, they have a robust capacity to handle the environmental impacts of naturally occurring wastes.

As humans formed communities, enlarged waste streams became an inevitable by-product of human culture, so much so that archaeology has sometimes been described as the intelligent picking through of ancient rubbish heaps. However, until the industrial revolution, the scope and magnitude of the resulting wastes has as a rule not been sufficient to do significantly more than local or regional ecosystem damage.

But now, due to the industrial revolution over the past few centuries, the impact of the wastes produced by our cities, activities, institutions, industries and enterprises has often put undue stress on the biophysical environment, leading to significant sustainability challenges. Perhaps the most notable case is that of carbon-rich emissions associated with the production and use of energy, and the resulting potential for long-term impacts on the world's climate patterns.

SIDS populations have traditionally depended on environmental and natural resources to make a living, especially through commodities such as sugar and bananas, other agro-based industries, fisheries, minerals and tourism (which now accounts for one in every four or five jobs in the Caribbean region, for example). This has led to a complex pattern of interaction of people, communities, institutions and industries with the environment, as energy and resources flow from the environment into patterns of human use, and as resulting waste materials flow back into the environment.

In turn, the rates and routes of these flows have been largely determined by the economic systems. The resulting interplay between economic and environmental systems has

therefore been highly dynamic, with interacting chains of causes and effects that span different nations and often cross generational boundaries.

Additionally, the economies of SIDS are also dynamic: they develop, expand, transform (and in some cases threaten to collapse) as new technologies are developed and old ones relocate to other parts of the world, so that patterns of resource demand and pollution output change accordingly. The SIDS economies are also changing as a result of economic globalization as World Trade Organization (WTO) agreements come into to force and SIDS continue losing access to traditional markets. These evolving economic systems are, in turn, influenced by cultural values and underpinned by social and psychological models that influence the ways in which the peoples of SIDS understand their options and make their choices. Thus, the sustainability of economic development will be materially affected by a nexus of interacting biophysical, political, economic, scientific, technological, social and cultural factors on local, regional and global levels. These factors affect – and are also affected by – how communities, enterprises and institutions in SIDS manage their wastes.

The information and experiences exchanged at the meeting defined the existing situation with regard to waste management in SIDS as follows:

- Limited financial resources available from the public sector are resulting in an unfortunate lack of waste management services. For example, only a few SIDS are able to afford the investment in sanitary landfill or adequate sanitation and sewage treatment facilities, which are the generally accepted methods of proper waste management.

- As government revenues become more limited, new approaches such as privatization of waste management services are now being instituted. One consequence is that poor communities continue to have less than effective systems of waste management, and often their only options are either to dispose of waste by burning or to dump it in drainage systems.

- There is a lack of information that further compounds the waste management challenge and also a lack of sharing of information on best practices. And there is a lack of data in qualitative and quantitative terms, further hindering the decision-making process. Where such information exists there is often limited sharing and dissemination. There is an absence of monitoring and effective use of measurable indicators.

- There is no coordinated approach among SIDS to facilitate the exchange of experiences and the development of new approaches. Donor agencies, both bi-lateral and others, continue to provide support usually in the form of loans to develop conventional waste systems. This results in the conversion of valuable land resources into waste disposal sites, annual recurrent operational costs, and no

chance of any degree of cost recovery despite the economic value inherent in the waste.

- Inadequate handling of waste problems in SIDS translates into concern of impacts on freshwater resources and in the coastal zone. Freshwater resources and coastal zone areas are vital to the welfare of SIDS. SIDS in general have limited availability of freshwater resources; the importance of the coastal area stems from its being the major location of economic activity (industry and tourism in particular), and also home to the vast majority of the population. Improper waste management represents a growing public health threat. In addition these coastal areas are rich in biodiversity and are highly productive ecosystems critical to the food security of SIDS.

- There is a lack of appropriate legal instruments in some cases; in others there is inadequate enactment and a lack of enforcement, or both. In addition to this, there is a lack of enforcement capacity as well as judicial awareness in most SIDS.

- Governments, the private sector, NGOs and local communities do not collaborate adequately on waste management decisions.

- Many SIDS are parties to international conventions and protocols that mandate the acceptance of imported waste. In some SIDS, ship- and airplane-generated waste (both solid and liquid) constitutes a significant proportion of the total waste stream requiring management. However, air and sea waste management facilities in most SIDS are inadequate and constitute potential threats to the environment and risks to public health. In addition there is a lack of harmonization of regulations and procedures across regions. It is also clear that SIDS lack effective capacity and mechanisms for the safe management of hazardous waste (agro-chemical, nuclear, persistent organic pollutants or POPs, heavy metals, etc.).

- There is increasing evidence of public health and ecosystem impacts of inappropriate waste management. Destruction of natural resources from current waste management practices is a result of poor waste management practices leading to pollution of groundwater resources and coastal waters, with associated degradation of critical ecosystems, such as coral reefs, sea grass beds, mangroves and coastal zones, and negative impacts on human health.

Dr. Thomas J. Goreau has made the following references in his work (please see Annex 1):

"Excessive nutrients released to the coastal zone from poor human waste management is the major factor causing coral reefs to be killed by algae. Coral reefs are the most nutrient-sensitive of all ecosystems. They are overgrown by algae at such low levels of nutrients that no other ecosystem would be affected. Water quality standards based on human health permit nutrient levels hundreds of times too high for corals. Much stricter, environmentally sound, nutrient standards are needed to protect coral reefs because

natural sources of nutrients are close to the limits that corals can tolerate in most reefs. A strict policy of zero waste nutrient discharge to the coastal zone is needed. When nutrient inputs are reduced, the algae quickly die off. Waste nutrients in the coastal zone not only destroy the ecological and economic value of coral reefs for fisheries, tourism, shore protection, and biodiversity, they represent a wasteful loss of fertilizers that are badly needed on land.

"Most plant growth, especially on islands, is well below potential due to lack of nutrients, An integrated nutrient management approach for whole islands and coastal zones is essential to minimize waste and maximize useful production on land and in the sea. Recycling nutrients on land is readily done using many approaches, whose effectiveness and cost depend on population density and land availability. Effective nutrient recycling would allow much greater production of food and energy on land while preventing destruction of reefs and fisheries. At present no coastal zone management unit knows how much nutrients are entering the coastal zone, where they are coming from, and the effects of natural variations or management of them.

"No SIDS are using currently available state of the art technology, which would allow continuous real-time measurements of nutrients to locate and every source and their magnitude and changes. Developments of these tools are essential to placing coastal zone management on a scientific basis and optimizing useful production in our lands and waters, the very point of sustainable development. They need to be applied not just to the coastal zone but to the whole adjacent land watersheds. Integrated management and recycling of all waste nutrients on land would result in true sustainable development of natural resources in both land and sea. Failure to manage nutrients properly will result in crippling losses as global warming, sea level rise, storm intensity, and pollution rise out of control."

- The planning, development and implementation of public awareness, education and information programmes tend to be ad hoc and insufficient. The impact of such interventions is not assessed for their effectiveness.

- In addition to the lack of public awareness, there is inadequacy in the education system combined with emigration of skilled labour. The complexity and fragility of SIDS ecosystems and the need for improved knowledge of the impact of wastes on ecosystem processes and biodiversity calls for greater public awareness and education.

- Environmental education in the formal education system is weak, and environmental issues are not adequately integrated into the curricula of primary and secondary schools.

- In all SIDS there is a high degree of capacity limitation at the systemic, institutional and individual levels. Particularly noteworthy at the systemic level is the inadequacy of the policy, legislative, regulatory and enforcement framework. In addition, the sources of financing available for waste management are limited,

and few external resources exist. Limited capacity and the onerous requirements of funding agencies also negatively affect the ability of SIDS to access international funding and to formulate appropriate plans and projects. This further increases dependence on external, often non-SIDS, entities for project development and implementation. Those that are available may lack experience and understanding of the needs of SIDS communities and may have different vested interests. At the institutional level, there is a lack of negotiating skills and technical expertise to backstop project development and management. At the individual level, there are few people with the requisite management and technical skills.

- The human resource capacity of the agencies involved in waste management is limited by the inadequacies of the formal education system, and also by the emigration of many skilled workers to the developed economies.

- Careers in waste management may not be perceived as attractive.

- There are few examples of good partnerships between governments and the private sector in effective waste management in SIDS; in all cases, poor communities are underserved and thereby more susceptible to disease.

- There is no practising of integrated waste management in any SIDS. In some SIDS, however, appropriate systems for effective waste management have been developed and demonstrated. A range of technologies is available, but not implemented, such as co-composting, anaerobic waste treatment systems and composting toilets.

5. ANALYSIS OF THE PRESENT SITUATION

Consistent with Agenda 21, SIDS, in common with countries around the world, are attempting to integrate environmental policy and economic development in a climate of increasing global competitiveness. The economic recession of the 1980s spurred a rethinking of approaches to dealing with waste. This has resulted in the view that waste is a sign of inefficiency, something to reduce and avoid rather than conceal. And in the opening session of the meeting the view was expressed that barriers to waste reduction in particular were more "attitudinal" than technical. As population and economic growth result in the generation of greater volumes of waste, continuation of the present trend will mean increasing public health risks, and degradation of critical ecosystems and with them the key services and goods they provide for the survival of SIDS.

SIDS share a number of characteristics that affect their ability to institute policies for economic development including: limited internal markets; lack of economies of scale; very high transportation costs resulting from the relatively small quantities involved; grave vulnerability to natural disasters; significant difficulties in attracting foreign direct investment; limited availability of human and institutional capacity; and the high cost of domestic capital. For SIDS to remain competitive they will need to do a better job than

other countries of integrating environment protection and economic development policies and strategies. This means that the existing attitudes in SIDS, which rate waste as a nuisance to be disposed of and not as a resource, need to be radically altered. One of the challenges is thus the restructuring of mindsets that prevent SIDS from seeing waste as a resource, as a subject for management and for integration with other sectors of the economy. The limited availability of land is a critical constraint for some technical options for waste management in SIDS, and is thus a driving force for the adoption of the integrated waste management (IWM) paradigm.

Increased private sector participation has been widely accepted as a way to improve service delivery. However, limited contract management skills and private sector capacity result increasingly in privatization approaches that are inappropriate, and can compromise the access of poor, rural and isolated communities to IWM. In addition, restricted financial resources and the lack of capacity in SIDS for effective privatization have led to outcomes that have failed to meet expectations. Paramount among these unmet expectations is equity of access for the poorer segments of the populations. Future public-private partnerships to support waste management should ensure that there is equitable participation of the local private sector and civil society. And that poor communities are not discriminated against.

SIDS remain vulnerable to solicited or unsolicited proposals from promoters of untested and inappropriate technologies. However, in many cases SIDS lack the technical capacity to evaluate these proposals. There is seldom recognition of the economies of scale in such applications as incineration and recycling making them economically viable. This can result in waste of limited resources, and possibly lead to the application driving unsustainable practices, further undermining the adaptation of potentially beneficial innovations in SIDS.

The close linkage between increasing urbanization, changing patterns of consumption and decreasing self-sufficiency, and increasing dependency on, and import of, polluting and waste-laden imports, requires different approaches by the public sector. Growing population densities are overloading waste management systems. Increased access to water-based sanitary systems and a concomitant increase in domestic waste-water generation has strained freshwater resources both in terms of quality and quantity. Additionally, the absence of proper sewage treatment systems has significantly increased the quantities of water-borne and sediment-rich nutrient loads in the near-shore and aquatic environment, threatening critical ecosystems. The pollution of groundwater and surface water resources in SIDS and in coastal areas by physical processes, chemical and biological waste, and saltwater contamination and intrusion constitutes a critical health and environmental issue, particularly in smaller islands and coral atolls.

Tourism is an important economic factor, but places additional stress on waste management. Ultimately it could help destroy the very ecosystems on which it depends.
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SIDS are vulnerable to transboundary wastes including land-based and ship-borne sources from outside their EEZ, international trafficking in toxic and radioactive wastes,

and airborne acid rain and greenhouse gas pollution from fossil fuels causing global sea-level rise. Low-lying Island States are literally drowning in wastes that are not of their making. At the global level, transboundary threats of improper waste management constitute a serious challenge for SIDS, which is further exacerbated by the failure of SIDS to ratify international instruments that could provide resources. In some cases SIDS have either not ratified, or are unable to honour their obligations under relevant international treaties related to the environment and waste management. But it should also be recognized that many of these instruments were negotiated in a context that did not include SIDS, and that there may be serious loopholes detrimental to them.

There is a need to develop and implement public awareness and education programmes that are appropriate to the specific needs of SIDS and focused on specific behavioural changes in target communities. Such information programmes have not been sufficiently emphasized in the education of the public hitherto.

Current waste management practices seldom reflect distinct social and cultural attitudes in SIDS towards innovations in waste management, such as waste-water reuse, eco-sanitation and biogas. Cultural values and attitudes constitute both a constraint and an opportunity for IWM implementation.

Lessons learned

In the course of the meeting and as a result of discussions on developments since the adoption of the BPoA, the following lessons learned were identified:

- There exists a range of proven appropriate IWM systems and approaches in SIDS, capable of replicability.

- Implementation of IWM systems brings about significant improvements in service provision and in public health and environmental quality.

- A team approach is needed to effectively negotiate agreements for waste management contracts. A range of skills is required, and therefore a single individual cannot adequately fulfil this function, nor should systems be built around individuals. The lack of a team approach was cited as a major weakness in the contracting of private entities for waste management tasks.

- The public sector has a critical role in creating an enabling environment for effective private sector participation, and in the regulation of agreements with the private sector.

- There is a need to facilitate contributory NGO and community participation, and to engage and empower local communities to deal effectively with waste management.

- There are several examples of waste management choices, such as incineration, that have resulted in the preclusion of more integrated and sustainable approaches.

Technological choices that do not allow for any synergistic links to other aspects of the economy or environment or livelihood systems should be considered as the last option.

As SIDS decision makers consider the development of more effective approaches to achieve sustainable waste management it is necessary to bear in mind:

- the different stages of economic development in SIDS
- the wide ranges in technical and institutional capacities
- the cultural differences
  the differences in governance systems, land tenure.

This means that a single solution will be unlikely to be effective for all SIDS – a clear message that international institutions should take fully into account.

The need for a new approach

All SIDS have a waste management challenge that has differing impacts depending on the geographical and economic situation of the island. There are common aspects to these impacts that would allow for synergies and cooperation, recognizing that SIDS have different levels of development and capacity, both in general and in specific waste management capacity.

The most common aspect of waste management in SIDS is the need for a new approach; this was the unanimous opinion of the meeting. Such an approach must be synergistic with livelihood, environmental sustainability and economic development. The meeting felt that the only option for SIDS in waste management was to pursue an integrated waste management (IWM) paradigm.

This need stems from the necessity to avoid duplication of effort and to make efficient use of SIDS' limited financial and institutional resources. And for this to happen, there must be coordination across sectors to attain a holistic IWM approach. This would include management of waste water, solid waste and air pollution. It was recognized that all SIDS are characterized by large coastal zones and are constrained by land availability. The critical issue of the fragility of sensitive ecosystems, such as coral reefs and coastal zones, and the need to protect them from biological, physical and chemical pollution can only be achieved through an IWM paradigm. This means that waste can no longer be viewed as a nuisance but as a resource from which social, economic and environmental benefits are to be derived (please see Annex 2). The presentations from the SIDS experts helped illustrate the growing vulnerability of SIDS, which was well demonstrated by recent negative developments in many SIDS that relied on inappropriate waste management technologies. The presentations further identified the urgent need for SIDS to take comprehensive action to institute IWM in order to reduce future vulnerabilities.

The process of economic and environmental globalization is putting in place standards to discourage economic activities that have significant negative impact on the natural environment. Manufacturers are being asked to meet new standards of waste disposal in

order to access export markets in the countries of the Organisation for Economic Co-operation and Development. Hence it is extremely important for SIDS to become fully aware of the implications of initiatives such as ISO 14000. On the surface, adherence to the initiative of the International Organization for Standardization is voluntary; however, such measures may become de facto requirements for access to wider export markets and helpful in dealing with investment banks, insurers and governments.

Outside of the manufacturing and industrial sectors where vested interest represents the driving force for improved waste management, there is no real coordinated effort by SIDS to explore different approaches to waste management beyond those prescribed for larger countries. Growing experience across SIDS reveals that waste management systems based on the technology and systems used in the developed countries have a number of limitations and not well suited to the needs of SIDS. The dominant approach to waste management in the developed countries is to treat waste as a nuisance – and the appropriate response is disposal.

Implementation of this approach is only possible with significant transportation assets as well as physical space for the development of landfills and waste-water treatment facilities. The vast majority of SIDS do not have the resources to invest in the requisite transportation, nor the physical space to develop the facilities. Furthermore, the nature of the waste and the geographical and social conditions that are typical of SIDS allow for consideration of technologies that are not regarded as mainstream in the developed countries. These include fermentation technologies ranging from anaerobic and aerobic fermentation to thermal conversion processes such as thermal gasification and low-temperature pyrolysis, and water purification processes such as reverse osmosis and light sterilization. All show the potential for SIDS to develop a different approach to disposal as the means of waste management.

The systematic integration of these technologies into IWM would, based on the available information and discussions at the meeting, be significantly more beneficial to SIDS, by allowing the greater percentage of waste to be used as raw material for the production of fertilizers, energy and irrigation water, for example, at costs below those associated with the usual disposal of waste (sanitary landfilling, dumping and conventional sewage treatment systems). Adaptation of new approaches also have the potential to make improved waste management available to the entire population, thereby further contributing to the reduction of the public health risks, damage to sensitive ecosystems and pollution of groundwater resources that are occurring in most SIDS.

6. RECOMMENDATIONS

In assessing the present situation and the lessons learned, the meeting recommended that national government:

I. ***As a priority adopts the integrated waste management paradigm in order to***:

1) reverse or halt degradation of key natural resources upon which livelihoods and survival depend

2) address the growing threat to public health from waste
3) address limited financial support and limited human capacity.

Transition to IWM requires SIDS to address the following key challenges:

1) encourage SIDS governments to recognize the importance of the waste management problem and to commit to IWM, in the form of increased budgetary allocations and mobilization of international and domestic resources
2) initiate behavioural change at the community and individual levels and public awareness and education on the waste management problem, through involvement and empowerment of local communities and capitalize on local endogenous strategies for waste management
3) protect and encourage practices in sustainable resource use that minimize the wasteful use and pollution of terrestrial, freshwater and marine resources and recognize that waste is a resource
4) move away from fragmented sectoral waste management and commit to IWM, thus avoiding ad hoc approaches to privatization, and ensuring the involvement of all stakeholders
5) improve the capacity for project formulation, implementation and evaluation
6) develop capacity across all sectors, through appropriate programmes of formal and informal training, education and public awareness
7) overcome reluctance to share and publicize information and create a culture of collaboration and information-sharing between agencies, departments, institutions and SIDS regions
8) enact and enforce local legislation and become party to and implement international conventions that support IWM principles and practices
9) promote good governance and enhance political will in relation to IWM, this to include increased transparency, accountability, communication and awareness of the issues, and enactment and enforcement of the necessary supporting legislation
10) mobilize external and domestic resources more effectively, particularly those available through multilateral environmental agreements (MEAs) and identification of appropriate economic instruments to support IWM.

II. ***Formulate national strategies that guide the transition to IWM systems, supported by and in cooperation with their regions and other SIDS, as well as other interested partners***.

The meeting identified the following key elements relating to national-level strategies.

1) policy formulation:
    - adoption, as appropriate, of "polluter pays" principle and precautionary principle, including rigorous use of the Environmental Investigation Agency
    - policies that make waste management a critical national priority in national sustainable development planning
    - policies for monitoring groundwater and surface water quality
    - policies for monitoring impacts on the environment (terrestrial, coastal and marine)

- policies to address hazardous waste (toxic, POPs, medical, etc.) and special waste (batteries, reconstituted cars, etc.)
- ratification of MEAs (Stockholm Convention on Persistent Organic Pollutants, Rotterdam Convention on Prior Informed Consent, etc.) and enactment of appropriate enabling legislation to meet their obligations, particularly in key areas such as port facilities for waste reception
- policies to sensitize and increase public awareness and develop public education programmes
- policies that take account of gender- and age-differential impacts
- policies to foster appropriate research and development (R&D)
- separation of regulatory and operational responsibilities to avoid conflict of interest
- strengthening the capacity of the judiciary for more effective enforcement of waste management legislation
- the necessity when developing policy to make appropriate linkages to existing legislation and to include scheduled revisions and updating of such legislation
- development of appropriate fiscal policies and incentives to support IWM, identification of appropriate tariff regimes and use of economic instruments to create sustainable revenue streams
- facilitating of partnerships between governments, NGOs, local communities and the private sector
- support of R&D into waste as a resource, as well as development of new markets for potential products
- increasing the availability of information on best practices as well as on negative consequences of improper waste management
- facilitating of the identification, adaptation and application of appropriate IWM technologies, in particular those that have been proven for other SIDS, as well as focusing on indigenous designs
- establishment of environmental trust funds dedicated to waste management specifically for the maintenance and use of IWM
- engages all key stakeholders.

III. ***Establish Type II partnerships with donor and SIDS-SIDS collaboration to develop capacity at individual, institutional and systemic levels in order to***:

- develop project conceptualization skills
- enhance project management skills
- increase technical cooperation among developing countries (TCDC), including internships, exchange of professionals, cooperation programmes
- train personnel in SIDS in relevant waste management techniques, including monitoring, evaluation and surveillance, and in hazardous waste
- improve information management and communications skills
- identify qualitative and quantitative characterization of the waste stream
- integrate IWM into formal education systems and the development of curriculum materials, programmes and retraining of teachers, and in-country scientific analytical skills

- institute leadership programmes for middle and senior-level managers, including conflict resolution and interpersonal skills
- develop negotiating skills (contracts)
- develop capacity for enforcement and awareness within the judiciary
- develop advocacy skills within NGOs
- develop appropriate legislation
- develop financial management skills
- set up on-the-job training and certification for plant operators and professionals.

IV. ***Implement governance structures to facilitate***:

- development and enactment of new or updated legal instruments, with particular reference to the management of hazardous waste
- establishment or strengthening of institutional frameworks (legal, operational) to allow for public sector, NGOs, local communities and private sector partnerships, also including intergovernmental organizations (IGOs) and research institutions
- development of mechanisms to facilitate stakeholder participation in all aspects of IWM
- establishment or strengthening of independent regulatory and enforcement agencies
- development of guidelines for accountability, transparency, performance targets and indicators, that also delineate clearly defined roles and responsibilities for all actors
- structures to ensure continuity of political commitment to IWM.

7. SUGGESTED STRATEGIES FOR IMPLEMENTING RECOMMENDATIONS

In order to proceed with the implementation of the recommendations the meeting identified the following strategies:

- undertake surveys of existing regulation and policies, to identify gaps and to ensure the harmonization across sectors and regions of IWM policies
- undertake reviews of existing standards
- undertake surveys of institutional and systemic capacity, human resource requirements and gaps
- characterize the waste stream – sources and types of waste, spatial and temporal
- undertake surveys of best practices and appropriate technologies
- develop cooperative approaches to strategic planning in regions and across SIDS
- integrate contingency plans for dealing with extreme pollution events due to human or natural disasters.

Critical inputs that are required were identified as:

- standards and targets, including the adoption of environmentally sound marine water-quality standards, that should be used for private and public IWM and that could be used as guidelines for regulators
- development of IWM guidelines appropriate to SIDS
- development of public education and outreach to include some best practices and the links to issues such as public health
- identification of financial resources: domestic and external
- a critical review of gaps in international instruments
- scientific and policy documents that are more easily understood and more accessible to the general public
- scientific documentation on the environmental, health and economic impacts of waste
- information on the impacts of imported waste
- information on military waste, in particular nuclear, biological and chemical waste and munitions.

Priorities and responsible entities identified are:

- national political commitment
- special authorities to be established or strengthened under national coordinating mechanisms, to deal with areas such as port waste facilities, water quality and waste-water management, etc.
- identify appropriate private sector partnerships
- regional and interregional cooperation
- mechanisms to provide for independent oversight of private/public partnerships and alternative delivery systems, or both, which should involve NGOs and local communities
- delineate clear distinctions between regulators and implementers
- greater collaboration between SIDS and R&D institutions, in particular for the purpose of capacity-building, training, R&D and monitoring IWM within SIDS
- integration of waste management strategies into other relevant sectors: water, agriculture, tourism, industry, fisheries and trade.

Implementation of the new IWM paradigm for SIDS should begin with:

- a unified statement by AOSIS leaders on IWM at Mauritius
- the establishment of national IWM coordinating committees or mechanisms
- the involvement of and development of meaningful partnerships with tourism, agriculture, shipping, military, commerce and industry
- maximizing the use of information and communications technology
- the development of data access protocols that will facilitate the effective sharing of information and expertise among SIDS
- the use of competitions as a means of engaging and empowering local communities and enhancing IWM awareness, and the promotion of environmental clubs

- mechanisms for sharing information on best practices and on negative consequences on the environment and public health of improper waste management, financial mechanisms, policies, appropriate technologies, curricula and education programmes, private sector contracting, including through the sharing of web-based curricula and training programmes and distance-learning modes
- greater collaboration and cooperation among SIDS research institutions
- the development of a policy toolkit for SIDS, coordinated by SIDSNet
- ensuring that SIDS international negotiators are informed of the critical threats posed by waste and of the potential negative impacts to critical ecosytems
- ensuring that the impact of imported waste is considered in international negotiations
- the establishment of a transboundary network to provide an early warning system on tracking hazardous waste and ensuring preparedness
- a detailed analysis of cost-recovery measures and the introduction of such measures
- the use of regional integration processes as catalysts for deepening collaboration and cooperation on waste management issues (such as CSME, PICTA/PACER, etc.)
- the development of programmes for the conversion of biodegradable waste to useful products and services through processes such as composting, co-composting, anaerobic fermentation systems, etc.
- action to put in place mechanisms to access existing international funding
- the establishment of mechanisms for evaluating technologies
- collaborative development of the capacity for the use of forensic waste analysis to identify and track sources of pollution and the responsible entities
- the development of communication and education strategies in order to effect changes in personal behaviour
- the necessity of considering waste management in relation to other sectors and carrying out waste audits based on the waste stream and characterization
- the necessity for scientific documentation of the impacts of waste on ecosystems and human health
- the strengthening of policy for watershed management, soil conservation, inland and forest protection and replanting, coral reef and marine area management and restoration of degraded ecosystems in SIDS as a means of reducing the waste of scarce water and soil resources, decreasing the need for fertilizers and addressing the serious problems related to the sedimentation and pollution of freshwater and near-shore marine ecosystems.