

A vertical photograph on the left side of the cover shows a tropical beach with palm trees and a clear blue sky at the top. Below the beach, the water transitions into a vibrant coral reef. A sea turtle is swimming in the water above the coral. In the foreground, there are various types of coral, including a large white one and a red one.

SECOND NATIONAL ENVIRONMENT ACTION PLAN

NEAP II

Ministry of Home Affairs, Housing and Environment
Republic of Maldives,



Second National Environment Action Plan

Ministry of Home Affairs, Housing & Environment
1999

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His Excellency Mr. Maumoon Abdul Gayoom
President of the Republic of Maldives

Almost on the threshold of the new millennium, we are adopting our second National Environment Action Plan to address the environmental challenges that we are faced with. This Action Plan has been prepared through wide consultations and provides a framework to guide our efforts in ensuring that the Maldives continues to develop in a sustainable manner which preserves and enhances the quality of our environment.

As a small low lying developing Island nation, the Maldives has to contend with a number of major constraints in meeting the challenges of sustainable development. For centuries we have existed in harmony with our natural environment, adopting lifestyles that have allowed us to live well within our limited resources. In recent years, however, the situation has rapidly changed. Our population has increased significantly, expanding with it the demand for goods, services, and social programmes. Fisheries and tourism have grown substantially. All these factors have increased pressures on our resources and, unless development is carefully planned, our fragile environment will be threatened.

Nine years after the adoption of our First National Environment Action Plan, we can be moderately pleased with our achievements. Many steps in the right direction have been taken. We have developed the legal framework for environ-

mental protection through the enactment of the Environment Protection and Preservation Act. We have strengthened and streamlined the institutional machinery to monitor and enhance the quality of the environment. In many areas of environmental policy, we have made significant progress and have begun to mainstream environmental concerns into other policies. To enhance the scientific basis for our decision-making, we have initiated research on environment. At the international level, we have ratified the United Nations Framework Convention on Climate Change, the Kyoto Protocol, the Convention on Biological Diversity, and the Convention on Transboundary Movement of Hazardous Wastes and their Disposal. The Maldives is also a party to the Vienna Convention for the Protection of the Ozone Layer and the Montreal Protocol on Substances that Deplete the Ozone Layer.

However, we cannot afford to be complacent. We still have a long road ahead of us. Many of the environmental issues that were only becoming apparent when we developed the First National Environment Action Plan in 1990 have now become very real. But we have come far enough to be able to see our goals more clearly and be able to chart a more confident path than nine years ago. Even so, many of the challenges that we confront today, such as climate change and sea level rise, are of such a great magnitude that we cannot on our own address these issues in a meaningful way. We deeply appreciate the assistance that we have received in the past from friendly countries and individuals, and look forward to their continued co-operation as we step into the new century and millennium.



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P R E F A C E

During the late 1980s a number of activities were initiated by various sectoral agencies of the Government of the Maldives in order to minimise the adverse effects of environmental degradation. It was recognised however that action taken on a sector by sector basis while commendable was not enough. In addition there was a recognition that a more comprehensive and integrated approach was required in order to allow for more coordination and cooperation amongst the sectors concerned and as a way to deal with environmental management actions that might not be addressed through individual approaches.

In 1988 with the assistance of the United Nations Environment Programme (UNEP) and the United Nations Development Programme (UNDP) a study was commissioned for the purpose of identifying components of the environment and its resources most vulnerable to natural and anthropogenic changes. The findings and recommendations of this study were deliberated at a workshop held in October 1989. The Workshop drew up the first National Environment Action Plan, which would provide the policy framework for carrying out environmental management and planning for the Maldives. The plan was subsequently reviewed and approved by the National Commission for Protection of the Environment and has served as a guide for the ensuing seven years.

Since the formulation and adoption of the first National Environment Action Plan the context for economic development and management of the environment has changed a great deal. Tourism, fisheries and other sectors have evolved and expanded, and there has been an increase in the population and other demographic changes, which have increased the real and potential threats to the environment of the country. As a result, it was felt timely to review the status of the implementation of the first National Environment Action Plan and formulate the second National Environment Action Plan based on the results achieved and within the current context of the state of economic and social development of the country. The second National Environment Action Plan also has been drawn up while giving due attention to the country's obligations under the new international and regional environmental conventions and agreements.

A review analysis of the first National Environmental Action Plan was undertaken during April to November 1997. Seven working groups made up of individuals from Government, NGOs and the private sector contributed to the review process. The working groups were concerned with: water, waste and sanitation; integrated coastal zone management; planning, urban development and environmental impact assessment; conservation of biological diversity; institutional arrangements; capacity building; and finance and resource mobilisation.

This analysis was undertaken with the assistance of the United Nations Development Programme. During the period, studies of environmental administration and environmental impact assessment processes and procedures in the country were also carried out with the assistance of the UNDP. In addition, the Ministry of Health and the Environment Ministry conducted inter-sectoral consultations on health and environment. The results of these studies and consultations have been taken into account in preparing the second National Environment Action Plan.

The preparation of the second National Environment Action Plan has also benefited from the fact that the 5th National Development Plan has been prepared during the same period. This has made it possible to ensure that the second National Environment Action Plan and the National Development Plan are compatible and complementary.

On the basis of the results of the above cited consultations, a draft for the second National Environmental Action Plan was prepared and deliberated at meetings of the working groups and also at a meeting of representatives of all the working groups held during November 1997. On the basis of these deliberations the second National Environment Action Plan was revised and presented to the National Commission for the Protection of Environment (NCPE) which approved the proposed activities to be undertaken through the second National Environment Action Plan.

THE SETTING



The Republic of Maldives consists of a chain of coral atolls, 80-120 km wide and 860 km long, which lie on the Laccadive - Chagos submarine ridge, in the Indian Ocean. The islands of the atoll system stretch from 7 degrees north to almost 1 degree south of the equator. There are altogether 26 natural atolls and the total area of the Exclusive Economic Zone is approximately 859,000 km².

The population of the Maldives, according to the 1995 census is 244,814 and currently inhabits 198 of the 1190 islands scattered through the atoll system. At present, 25.5% (62,519) of the population live in Malé, the capital of the Maldives. Of the other inhabited islands, 75 have fewer than 500 people, 75 have between 500 and 1,000 inhabitants, 47 have between 1,000 and 5,000 inhabitants, and only 4 have more than 5,000 inhabitants. Over 80% of the land area of these islands is less than 1 meter above mean sea level.



The mainstay of the Maldives economy is presently derived from tourism and fisheries and their associated industries. While the traditional lifestyle of the Maldivians had very little adverse impact on the environment, population growth, the expansion of the fisheries and tourism sectors, and the concomitant development of the other sectors of the economy and society have posed threats to the quality of the environment and the natural resource stock of the country. This situation has presented serious challenges to the Government in ensuring minimal damage to the very environment on which the sustainable development of the Maldives depends.

Achievements of the First NEAP

The first National Environment Action Plan (NEAP) formulated in 1990 to address the environmental planning and management needs of the country was followed as the overall environmental management strategy of the Government. It represented a combined approach to managing and solving environmental problems and establishing the mechanisms for future sound management of the environment. The principal aim of the NEAP was to help the Government of Maldives to maintain and improve the environment of the country, including the marine and ocean area contained within the Exclusive Economic Zone, and to manage the resources contained therein for the collective benefit and enjoyment of present and future generations.



Two Million Trees Programme

Since the first National Environment Action Plan, the Maldives has achieved considerable progress in environmental protection and management. The Government and the public have made great efforts and these efforts have brought many of the objectives in the first National Environment Action Plan within reach.

The greatest progress has been made in establishing the regulatory and institutional framework for environmental protection. The Environmental Protection and Preservation Act of the Maldives was enacted in April 1993. The Act contains provisions on conservation of biological diversity, protected areas management, environmental impact assessment, waste management, and transboundary movement of hazardous substances. Under a programme for the strengthening of national environmental legislation, a task force was established in 1996, to review existing national legislation dealing with environmental management and to examine the adequacy of the legislative and institutional framework.

Environmental impact assessment (EIA) has been made mandatory for all new projects in the Maldives by Section 5 of the Environmental Protection and Preservation Act of the Maldives (Law No: 4/93). According to the Act, an impact assessment study shall be submitted to the Ministry of Home Affairs, Housing and Environment before implementing any activity that may have an impact on the environment. To streamline and facilitate the EIA process in the country, the Cabinet approved a set of guidelines outlining the procedures for EIA in December 1994.

The National Commission for the Protection of the Environment (NCPE), appointed by the President in 1989, was restructured in 1993, broadening the consultative process on environmental protection. The mandate of the NCPE is to advise the Government on environmental assessment, planning and management, and in ensuring that environmental protection is a vital component of all development projects. The NCPE is composed of senior officials

representing relevant Government departments and two members of parliament.

An Environment Research Unit was established in 1990 to strengthen the scientific base for environmental decision-making and to assemble the necessary environmental information for planning and management.

The Government, recognising the importance of conserving biological diversity in the Maldives, was among the first to ratify the Convention on Biological Diversity. The Maldives signed the Convention on Biological Diversity on 12 June 1992 and ratified the Convention on 28 October 1992. With assistance from the Global Environment Facility, the Maldives started formulating its National Biological Diversity Conservation Strategy in 1998.

To date, 15 sites have been designated by the Government as protected areas. Two islands, Hithaadhoo (North Huvadu Atoll) and Hurasdhoo (South Ari Atoll), have been declared as protected islands because of their unique avian population and geological formation, respectively. A number of species including turtles, whales and whale sharks, black coral, dolphins, pearl oysters, stony corals, eels, parrot fish, bait fish, skates and rays, trochus shells, triton shells, and puffer fish have been declared as protected species in the Maldives. *Gygis alba monte*, a rare bird in the Maldives, but commonly found in Addu Atoll only, also has been declared as a protected species. A project to enhance the national capacity to identify and manage protected areas is underway.

In addition, the Ministry of Fisheries, Agriculture and Marine Resources has formulated an integrated reef resources management programme to assist in the sustainable exploitation of reef resources. The agenda for sustainable reef resource development was drawn up in March 1996 in consultation with various resource users, community groups, and Government departments.

A three-year nation-wide programme to plant two million trees began in January 1996. Under this programme, special emphasis is given to restoration of threatened habitats and re-introduction of certain locally threatened species.

A campaign to promote sustainable consumption patterns in the Maldives and to address the escalating problems of waste generation and disposal was launched under the slogan "Independent Maldives - Clean Maldives" on 26 July 1996. Under this campaign, the necessary policy framework, management systems and action programmes to promote sustainable lifestyles will be developed.



Independent Maldives: Clean Maldives Campaign

A number of the assessment activities and awareness building activities identified in the first National Environment Action Plan have been completed. The Maldives has started field-testing the set of sustainable development indicators developed by the Department of Policy Co-ordination and Sustainable Development of the United Nations. The selected indicators will be used in the future as a yardstick in measuring progress towards sustainable development. Human resource development and environmental education were given high priority in the plan period and significant progress has been achieved in these areas as well.

Current Environment Policy

Apart from the policies and measures outlined in the first National Environment Action Plan, the importance of sound practices for environmental and natural resources management is stressed in various parts of the fifth National Development Plan. In the fifth National Development Plan, the stated objectives are to ensure:

- that future planning is for sustainable development and that sound environmental assessment is an integral part of national, regional, and sectoral master plan formulation exercises;
- that all existing and future development activities are subject to sound environmental management regimes and practices;
- that all new major projects, including major public infrastructure and private development projects, are subject to effective environmental impact assessment procedures prior to approval;
- that there are institutional arrangements to ensure that sustainable development can be achieved;
- that all existing and future development activities are designed and managed to minimise the negative impact of environment on human health.

Specific objectives related to the provision of infrastructure to manage the impacts of human settlements on the reef and lagoon environments and groundwater resources are also stated in the fifth National Development Plan along with policies concerning the sustainable management of fisheries and tourism.

In addition to the objectives outlined, the fifth National Development Plan foresees a number of elements that will be incorporated into the National Vision 2020 statement. With respect to environment the elements in this vision are:

- extensive infrastructure to manage the impact of human activity on the marine and terrestrial environments;
- a comprehensive strategy for environmental management including effective environmental impact assessment procedures;
- urban development which proceeds in a manner that takes into account natural hazard risks, and will minimise risk to life and property from natural disasters;
- sustainable tourism development;
- public awareness raising and education.

With respect to social, human and infrastructure development, the elements are, *inter alia*:

- universal access to safe water;
- appropriate sanitation and effluent disposal systems;
- elimination of vector borne diseases;
- reduction of negative impact of air and noise pollution and that of urbanisation on human health; and
- protection of human health from occupation related disease conditions.

International Context

In addition to its local environmental concerns, the Government has to work in the wider international context because of the potential threats posed by externally generated problems and the collective responsibility for sustainable development at the global level. Perhaps, the major environmental issue for the Maldives is that of climate change and associated sea level rise. The Maldives is a small, low lying island nation and will be seriously affected by the possible impacts of global warming, climate change and sea level rise. As a result, the Maldives plays a prominent role in international fora calling to attention the fragile nature and special vulnerability of small island developing states.

To discuss the issues of sea level rise among the small states of the world which are the most vulnerable to climate change, the Small States Conference on Sea Level Rise was held in Malé, in November 1989. The outcome of the conference was the Malé Declaration on Global Warming and Sea Level Rise. The Malé Declaration paved the way for the establishment of the Small Island Action Group, that eventually became the Alliance of Small Island States (AOSIS) at the Second World Climate Conference in Geneva, in 1990.



Small States Conference On Sea Level Rise - Malé - 1989



President Gayoom signing the Climate Convention - Rio de Janeiro - 1992

The Maldives is a party to the United Nations Framework Convention on Climate Change, adopted at the Earth Summit in 1992. The Maldives also played an active part in the international negotiations to obtain commitments beyond the year 2000 for effective reductions of greenhouse gas emissions that led to the Kyoto Protocol, and was the first country to sign the Protocol.

Since the adoption of the first National Environmental Action Plan, the international context of environmental management has changed considerably. A number of international conferences have been held and a number of international conventions and agreements have been negotiated and enforced. The Agenda 21 and the Rio Declaration on Environment and Development have

become the new symbols of common responsibility shared by all States, to protect the one world we all inhabit.

The Global Conference on the Sustainable Development of Small Island Developing States (SIDS Conference) held in Barbados in 1994, translated Agenda 21 into specific policies, actions and measures to be taken at the national, regional and international levels to enable small island developing states to achieve sustainable development. The Maldives played a very active part in the formulation of the Barbados Action Programme and is committed to implementing this programme.

The Convention on Biological Diversity; the United Nations Convention on the Law of the Sea; and the Washington Declaration on Protection of the Marine Environment from Land-Based Activities are other important international environmental agreements that urge for common action to protect the environment and the natural resources contained therein.



13th Session of the Intergovernmental Panel on Climate Change - Male' - 1997

At the regional level, the South Asian Association for Regional Cooperation (SAARC) and the South Asia Co-operative Environment Programme (SACEP) have formulated important plans and programmes on environment. The SAARC Environment Action Plan adopted in 1997 in Male' provides the blueprint for regional action to protect the environment in the SAARC region, and at the regional level thus primary focus will be on the effective and early implementation of the SAARC Environment Action Plan. The Maldives is also committed to the early implementation of the recommendations of the SAARC Regional Study on the Greenhouse Effect and its Impact on the Region and the SAARC Regional Study on the Causes and Consequences of Natural Disasters and the Protection and Preservation of the Environment. The Government of Maldives will also participate in the work of SACEP and give special emphasis to implementing the South Asian Seas Programme developed by the United Nations Environment Programme.

Second National Environment Action Plan

It is therefore against this general setting that the second National Environment Action Plan is drawn up. The results of the first National Environment Action Plan have elucidated the main ingredients for successful implementation of environmental policy and programmes at the national level. Thus the second National Environment Action Plan is based on the need to take an integrated approach to the management of the environment and to work towards the goal of sustainable development. The approach taken in the formulation of the second National Environment Action Plan results in drawing out a number of key issues which need to be addressed and then identifying appropriate responses to them.

FRAMEWORK FOR ACTION

Aim and Strategies

The aim of the second National Environment Action Plan is to:

protect and preserve the environment of the Maldives, and to sustainably manage its resources for the collective benefit and enjoyment of present and future generations.

The main strategies forming the framework of the second National Environment Action Plan are:

- continuous assessment of the state of the environment in the Maldives, including the impacts of human activities on land, atmosphere, freshwater, lagoons, reefs and the ocean; and the effects of these activities on human well being;
- development and implementation of management methods suited to the natural and social environment of the Maldives, and maintain or enhance environmental quality and protect human health, while at the same time utilising resources on a sustainable basis;
- consultation and working with all relevant sectors of society to ensure stakeholder participation in decision making;
- preparation and implementation of comprehensive national environmental legislation in order to provide for responsible and effective management of the environment;
- adhering to international and regional environmental conventions and agreements and implementation of commitments embodied in such conventions;
- strengthening of national capabilities, including institutional arrangements and human resource development for effective public participation, management and administration;
- financial support, co-operation and commitment to enable the action plan to be implemented in an efficient and cost effective manner.

Key Issues

To achieve environmental protection and sustainable development a number of issues have to be addressed. The following are the principal and immediate issues identified as present priority issues in the consultations for the second National Environment Action Plan.

Climate change and sea level rise
Coastal zone management
Biological diversity conservation
Integrated reef resources management
Integrated water resources management
Management of solid wastes and sewage
Pollution control and managing hazardous wastes
Sustainable tourism development
Land resources management and sustainable agriculture
Human settlements and urbanisation

The specific actions that are necessary to address the special environmental challenges faced by the Maldives at present are identified in the next section. In order to ensure the effective implementation of the second National Environment Action Plan, it is essential to have the necessary legal, institutional and administrative arrangements. Hence, strengthening of the following means of implementation will be given high priority.

- Environmental law
- Environmental administration
- Public awareness and education
- Science and research
- Human resource development

All components of this plan are interdependent and provide a framework for comprehensive action that should contribute to the protection of the environment and sustainable development of the country. No component should be seen as an end, in and of itself.

Building Partnerships

The aim of the second National Environment Action Plan can only be achieved by working within the Government's overall environmental policies and agreed action plans, and through collaboration, thus building partnerships with all those who share common objectives. We will maintain existing partnerships and develop new ones with key stakeholders.

The Health and Environment Action Plan (to be developed in collaboration with the Ministry of Health) and the Agenda for Integrated Reef Resource Use (developed by the Ministry of Fisheries, Agriculture and Marine Resources) complement the second National Environment Action Plan and the provisions contained therein are in agreement with the aims and objectives of the second National Environment Action Plan.

Programme Cycle

The second National Environment Action Plan identifies the environmental priorities and policy directions for the next 6 years. In order to achieve the aim of the Action Plan and in accordance with the themes, a specific work programme will be developed for each biennium. The programme will describe the project activities to be undertaken during each biennium and would also facilitate timely review and, based on experience during implementation, will allow for periodic changes in the foreseen actions.

ADDRESSING KEY ISSUES

Climate Change and Sea Level Rise

Issue:

Climate change is an alarm signal for the whole of humanity. According to the Intergovernmental Panel on Climate Change, the average global temperatures will rise by between 1 to 3.5°C by the year 2100 and, on the same time scale, the sea level will rise by between 15 and 95 cm. The Maldives is particularly vulnerable to the predicted sea level rise. In a worst case scenario, the very existence of the Maldives is threatened, as over 80% of the land area of our islands is less than 1 metre above mean sea level. The Government is committed to finding solutions to the problems of climate change and sea level rise. The Maldives is a party to the United Nations Framework Convention on Climate Change, and is the first country to sign the Kyoto Protocol.



Incidence of high waves - Male' - 1987

Actions, policies and measures:

Continue to play a key role in highlighting the special vulnerability of small low-lying island developing states and in getting due attention to this issue in international forums.

Continue to play an active role in the work of the United Nations Framework Convention on Climate Change, the Kyoto Protocol and any other instruments to the Convention.

Prepare a national inventory of greenhouse gases, their sources and sinks in accordance with the Intergovernmental Panel on Climate Change (IPCC)/Organisation for Economic Co-operation and Development (OECD) Greenhouse Gas Inventory Guidelines, and assess energy consumption patterns and evaluate non-conventional energy sources and their potential for utilisation.



Sea defences in Male' built with Japanese aid

Formulate national options for limitation of greenhouse gas emissions.

Assess the vulnerability of the Maldives to climate change and sea level rise in the context of integrated coastal area management; and, on the basis of the assessment, establish a network of sites where sea level rise and coastal erosion can be monitored over time.

Map areas vulnerable to sea level rise and develop computer based information systems covering the results of surveys, assessments and observations as part of the development of adequate response strategies, adaptation policies and measures to minimise the impact of climate change, climate variability and sea level rise.

Formulate a set of alternative options for adapting to climate and sea level changes that are evaluated and ranked in the context of integrated coastal area management.

Prepare a nationally endorsed implementation plan on climate change.

Formulate and submit the first national communication of the Maldives to the Conference of the Parties to the United Nations Framework Convention on Climate Change.

Increase the participation in the global research, assessment, monitoring and mapping of climate impacts, including the adoption of measures and policies, and the development of response strategies.

Promote more efficient use of energy, and encourage introduction of environment friendly energy sources.

Implement the Ozone Country Programme of the Maldives and fulfil the commitments of the Maldives under the Montreal Protocol on Substances that Deplete the Ozone Layer, and the relevant amendments to the Protocol.

Coastal Zone Management

Issue:

As the islands of the Maldives are small and low-lying, the entire nation can be considered as a coastal entity. Moreover, the population and all economic development activities are concentrated entirely in the coastal zone. Beach erosion is at present one of the most pressing environmental issues in the Maldives. This problem mainly results from human intervention in the coastal environment and a continuing effort is needed to ensure that integrated approaches to managing coastal areas are taken.



Actions, Policies and Measures:

Initiate a program of systematic surveys, monitoring, data analyses and documentation of beach erosion.

Continue accumulation of data and prepare an atlas including information on wind, ocean currents, wave and climate.

Continue the program of controlled vertical aerial photography to cover all the islands of Maldives.

Establish and enhance the capability for undertaking bathymetric and beach surveys.

Establish a Technical Committee on Coastal Zone Management under the aegis of the National Commission for the Protection of the Environment to provide knowledge and expertise on coastal zone issues, and to ensure that cross-sectoral integrated approaches are used in addressing coastal problems.

Establish a Coastal Engineering Support Unit for the purpose of providing guidelines, coordination, research and development, and as point of contact for inputs to coastal planning. This Unit should prepare and encourage the adoption of guidelines for integrated coastal area management and should work closely with the Technical Committee on Coastal Zone Management.

Develop and implement integrated coastal zone management plans, integrate them within national development plans and encourage atoll coastal area management through community participation.

Formulate criteria and adopt guidelines and codes of practice for the construction and location of coastal structures such as seawalls, groynes, harbours, jetties, piers, and causeways.

Strengthening and enforcing measures that will encourage the use of imported construction materials thereby helping to minimise the use of locally mined coral and sand.

Develop and implement a programme to monitor the amount of coral and sand mined.

Adhere strictly to environmental impact assessment procedures in the planning of development projects and in giving operating licenses to industrial activities.

Establish a program for training staff in coastal engineering and integrated coastal area management.



Conservation of Biological Diversity

Issue:

The coral reefs of the Maldives are renowned for their aesthetic beauty and species diversity and the reefs support stocks of endangered species. The physical formation of the small islands of the Maldives itself is very unique and the terrestrial ecosystems are biologically rich and diverse. However, due to the small size, isolation and fragility of island ecosystems, the biological diversity of the Maldives is threatened. Coral reef deterioration and habitat degradation remain the main causes of the loss of biological diversity in the Maldives. Recognising the importance of conserving biological diversity, the Maldives has signed and ratified the Convention on Biological Diversity.



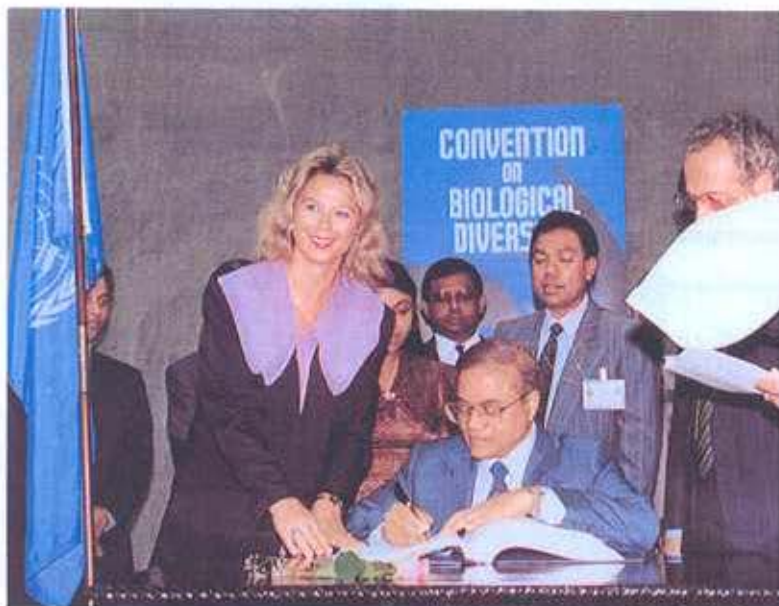
Actions, Policies and Measures:

Undertake a detailed assessment of biological diversity including detailed inventories of existing flora, fauna and ecosystems, in order to provide the basic data needed for the conservation of biological diversity.

Identify and analyse options to meet the objectives of the Convention on Biological Diversity, including strategies for conservation, sustainable use and benefit sharing.

Prepare and implement a National Biological Diversity Strategy and Action Plan.

Prepare the first national report to the Conference of the Parties of the Convention on Biological Diversity.



President Gayoom signing the Convention on Biological Diversity - Rio de Janeiro - 1992

Identify sites of high biological significance for the conservation of biological diversity, tourism, and other sustainable development opportunities and designate them as protected areas.

Accede to and implement the Convention on International Trade in Endangered Species of Wild Fauna and Flora and other relevant international and regional conventions.

Protect and regenerate endangered species, sustain bird populations and conserve the habitat of threatened species.

Integrated Reef Resources Management

Issue:

Recently, the use of reef resources has increased dramatically with the growth of the tourism industry and the opening of new export markets for reef fishery products. Over-fishing of some reef resources, increased reef degradation, and an increase in conflicts among reef resource users are concerns that need to be addressed urgently. Recognising that sustainable development of tourism and fisheries in the Maldives depends largely on reef resources, the Government is actively promoting a policy of integrated reef resources management. The National Workshop on Integrated Reef Resources Management (Male', 1996) prepared a comprehensive set of recommendations on integrated utilization of reef resources. The Collaborative Plan for Integrated Reef Resources Management forms an integral part of the present Action Plan.



Actions, Policies and Measures:

Assess the health of the Maldivian coral reefs including coral and coral reef growth, sand production by natural systems, and assessment of impacts of coral bleaching; coral mining and sand extraction; reclamation and dredging; crown of thorns predation; tourism; and reef fisheries.

Initiate a collaborative, participatory reef resources monitoring and management programme involving people directly engaged in reef resource utilisation (e.g. fisherfolk, the tourism industry, coral miners), as well as Government agencies, relevant NGOs and other stakeholders.

Introduce pilot scale Integrated Reef Resources Management programmes on an atoll by atoll basis, working through existing Atoll Development Committees and Island Development Committees.

Increase awareness of the fishing community, in particular, and the public, in general, on issues relating to reef resources management, such as the dangers of over-fishing, advantages of sustainable resource use, impacts of coral mining and the benefits of using alternatives to coral rock for construction.

Develop and implement a plan for phasing out coral mining and provide incentives and market mechanisms to make alternatives to coral rock acceptable, and encourage the use of alternative material in maritime structures.

Establish a network of marine protected areas, covering approximately 20% of the total atoll area and including representative samples of all major habitats, designed to act as harvest refugia and to protect breeding stocks and biological diversity.

Identify potential fishery targets, assess fishery yields, carry out market research on them, and disseminate the resulting information to the public.



Enforce existing laws and regulations concerning reef fisheries and exploitation of other reef resources and strengthen the national institutional capacity to manage reef resources.

Assess and evaluate the reef fishery stocks and regulate exploitation to ensure sustainability.

Monitoring of coral reefs for coral diseases, growth of blue green algae and cyanobacterial mats.



Sustainable Fisheries Management

Issue:

The Maldivian government has always accorded high priority to sustainably manage the tuna fishery of the country. The present fishing methods environmentally sound and maximize the economic and social benefit derived from the tuna fishery. In order to maximize the economic and social benefit derived from the tuna fishery, it is important to explore means of rational utilization of these tuna resources in the Exclusive Economic Zone of the Maldives, which at the moment is under-exploited. The Maldives actively promotes sustainable fisheries management at the international level as well. The Maldives ratified the United Nations Agreement relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks in December 1998. Recent years have witnessed a dramatic expansion of the tuna fishery in the Indian Ocean and since this might have a negative effect on the local tuna fishery, it is important to monitor the fishery and promote sustainable management, at the regional and international level.



Actions, Policies and Measures:

Formulate and implement a ten-year fisheries development master plan.

Review the present Fisheries Law of the Maldives (Law no: 5/87) in order to improve the legal and institutional framework required for sustainable fisheries management.

Strengthen the institutional capacity for the monitoring and enforcement of regulations relating to sustainable fisheries management.

Strengthen the national capacity to monitor and assess the state of the country's pelagic fish stocks, including development of research capacity necessary to assess the effect of climate or environmental change on pelagic fish stocks.

Improve the knowledge regarding the structure of the marine species subjected to exploitation by conducting long-term scientific research.

Increase public awareness on issues relating to rational utilization of pelagic resources.

Develop and implement a plan to increase the rational exploitation of pelagic resources in the Exclusive Economic Zone of the Maldives.

Participate actively in the work of sub-regional, regional and international fisheries management organizations, to ensure effective conservation and sustainable management of pelagic resources, for the benefit of small island states.

Develop and implement Hazard Analysis and Critical Control Points (HACCP) to enhance the quality standards of the Maldivian fishery products.



Integrated Water Resources Management

Issue:

The hydrology of the Maldives is typical of coral islands, where the water table is shallow and confined to a lens of thin freshwater floating on the denser salt water. This lens of water has been maintained in good balance between use and recharge by rainfall and the small population in islands. However, the growth in population coupled with the changing culture of water usage has led to severe constraints in terms of both the quantity and quality of freshwater in many inhabited islands. Groundwater contamination due to sewage disposal in the constraints of the island environment is also a serious issue in a number of islands. Thus, provision of clean freshwater to the population is one of the most serious environmental challenges facing the country.



Actions, Policies and Measures:



high quality potable freshwater.

Assess the quality and quantity of groundwater in selected islands, with priority given to identified growth centres, major agricultural islands, and islands experiencing salt water intrusion resulting from extraction of ground water.

Develop an integrated national water resources management master plan.

Optimise rainwater collection and storage, and acquire appropriate technology and training for cost-effective desalination, in order to provide sufficiently

Develop and strengthen monitoring and assessment capabilities, maintain water resource databases, and utilise relevant decision-making tools for water management, planning and utilisation.

Enhance public awareness on water conservation, introduce water saving devices, and use appropriate incentives and regulatory measures to control indiscriminate pumping of groundwater.

Protect freshwater resources including ground water aquifers and inland lagoons.

Management of Solid Wastes and Sewage

Issue:

The small size of the islands, the rapid growth in population, changing consumption patterns, increase in imports of chemicals and hazardous substances and lack of resources for safe disposal now make management of wastes and pollution prevention a critical issue for Maldives. The disposal of solid wastes presents a serious constraint to sustainable development and in densely populated islands has become a critical problem. Limited land area makes the option of landfill disposal unsustainable in the long term. Dumping in the sea is not acceptable for aesthetic reasons, and as it would affect tourism and fisheries, the two mainstays of the economy. Incineration, while reducing the volume of wastes, is prohibitive in terms of costs and requires disposal of ash. Disposal of liquid wastes is also a growing problem in the islands and the ground water in most of the islands is contaminated due to improper disposal of sewage.

Actions, Policies and Measures:

Assess the solid waste disposal problems in inhabited islands, tourist resorts and industrial islands.

Develop and implement appropriate policy and regulatory measures for the reduction of waste, the safe and efficient management of solid wastes, and for the proper management of disposal sites.

Develop fiscal and policy incentives and other measures to encourage the import of environment friendly products with minimal waste or with degradable waste content.

Formulate and implement public awareness and education campaigns designed to gain local recognition of the value of waste reduction, re-use, recycling, appropriate packaging and of the possibilities for converting wastes to resources.

Introduce clean technologies in the industrial sector and appropriate technology for solid waste treatment and disposal.

Provide integrated water supply, sewage and wastewater treatment systems for the identified growth centres.

Develop and enforce standards for the discharge of municipal and industrial wastewater, including laying of sewer systems, and construction of septic tanks.

Strengthen the institutional capacity for enforcement of regulations and monitoring, including the training and licensing of plumbers to ensure better quality of work.



Pollution Control and Managing Hazardous Wastes

Issue:

Though the marine environment of Maldives is still in a sufficiently pristine state it is very susceptible to stress from pollution. Thus precautionary measures are necessary to prevent degradation of the marine environment so as to maintain and improve its life support and productive capacities. The use of chemicals is on the increase and measures to reduce their health and environmental impacts are necessary as well. Special programmes are also needed to identify toxic and hazardous wastes generated in the Maldives and to dispose them safely.

Actions, Policies and Measures:

Assess the present use of pesticides, evaluate agricultural practices in the context of integrated pest control, and prepare guidelines and recommendations for control of pesticide and herbicide use.

Assess current practices for the disposal of clinical and toxic wastes and establish procedures for disposal of such wastes.

Establish a national chemicals database and develop manuals and guidelines on the safe use and disposal of commonly used chemicals.

Review and revise the existing marine pollution contingency plan with particular focus on oil pollution prevention and preparedness.

Formulate and implement strict regulations to reduce the risks of accidents and pollution from all vessels and cargo ships.

Establish facilities to collect waste oil, chemical wastes and garbage at ports, fishing harbours and marinas.

Establish and enforce appropriate codes of practice for the handling, transportation and storage of petroleum products.

Develop a national strategy for the effective implementation of the Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal.

Ratify and implement relevant conventions, including the Prior Informed Consent Convention on chemicals, the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter and the Washington Programme of Action on Prevention of Pollution from Land Based Activities.

Sustainable Tourism Development

Issue:

Tourism in the Maldives primarily depends on the natural environment: the physical and geographic features of coral islands, the beauty of underwater world, clean water in the lagoons, white and pristine sandy beaches, rich island vegetation and the ideal tropical climate. The natural resources of the Maldives are in a sufficiently pristine state, of very high aesthetic quality and there are relatively few serious environmental concerns in the tourism sector at present. However, it is also believed that with increasing environmental pressures resulting from expansion of tourism development and

rising environmental sensitivity, adverse effects may be felt sooner than later unless appropriate planning and management measures are undertaken. The objectives and targets related to environmental protection and preservation outlined in the second Tourism Master Plan form an integral part of this Action Plan.

Actions, Policies and Measures:

Continue the implementation of integrated planning and policies to ensure sustainable tourism development; including use of environmental impact assessments in tourism planning and all tourism projects, and monitoring tourism impacts on environment, culture and heritage.

Ensure effective enforcement of guidelines and standards on tourist resort design and construction, energy generation and conservation, water production and conservation, generation and disposal of waste, sewage and wastewater disposal, conservation of flora and fauna, landscaping and carrying capacity standards.

Foster awareness of environmental ethics among tourists, resort management, local island communities and tour operators in order to ensure conservation and sustainable use of resources; public guardianship of the natural environment; and reduce consumption and waste.

Safeguard natural, social and cultural integrity.

Provide support for local economies through local community involvement.

Strengthen the consultative process with stakeholders and the public.

Promote human resource development.

Promote responsible tourism marketing, and develop facilities to meet specific niche markets, particularly in eco-tourism, nature and cultural tourism.

Assess the environmental impacts of tourism and sustainability issues continually.



Land Resources Management and Sustainable Agriculture

Issue:

The small size of the islands, coupled with land tenure systems, increasing population, commercial activities, and the need to provide services infrastructure create competition for land and lead to land use management issues in the Maldives. Thus, most aspects of environmental management are influenced by the planning and utilisation of land resources and are intimately linked to coastal zone management, as the islands in the Maldives are in themselves entirely coastal entities. Land should be used in ways that provide the greatest sustainable benefits and special emphasis needs to be given to promote sustainable agriculture in the Maldives. People need guidance and training in the use of technologies and farming systems to ensure the proper management of agricultural resources in the country.



Actions, Policies and Measures:

Undertake comprehensive surveying and mapping to cover selected islands with priority given to the identified growth centres.



Enhance the national physical planning capability, focussing on development of policy guidelines as well as integration of physical planning with environmental impact assessment.

Prepare comprehensive land use plans for all inhabited islands to protect land resources, ensure sustainable and productive land use and guard against exceeding growth limitations, land degradation, and pollution.

Develop and improve national land use databases, including estimates of the carrying capacity, economic and environmental value of land resources, and enhance the use of Geographic Information Systems.

Encourage appropriate forms of land tenure, and improve legal and administrative capacity for land use management in order to facilitate sustainable land use.

Encourage environmentally sound farming practices and promote use of appropriate technologies.

Conserve the plant genetic resource base of the country.

Encourage use of composting to replenish and maintain soil fertility and use integrated pest management to control pests and diseases on islands.

Manage forestry and firewood by adhering to planned schedules for re-planting, logging and firewood collection from designated sites.

Continue extensive tree planting programmes and conserve trees of special significance.

Human Settlements & Urbanisation

Issue:

Presently, the capital city of Male' is considered the only urban centre although some other islands are rapidly becoming urban centres. The fast pace of urban development in Male' has led to a number of problems. These include land shortage, over-crowding, deteriorating housing conditions, high economic cost of urban infrastructure, and declining freshwater quantity and quality. Air pollution due to dust, smoke and fumes from motor vehicles is also reaching levels of concern in Male'. Special measures are needed to ensure that urban life is sustainable and avoid the mistakes of the past when new settlements are developed.



Actions, Policies and Measures:

Improve the availability, affordability and environmental quality of shelter, in accordance with Chapter 7 of Agenda 21.

Develop a national strategy for housing and urban development in the Maldives.

Develop and disseminate manuals and guidelines on environment friendly housing.

Undertake strategic environmental assessments to ensure that new settlements are built on islands that are environmentally suitable and reduce the risk of damage from natural phenomena.

Establish a programme to monitor the environmental impacts of Hulhumale' development.

Plan urban areas and growth centres to reduce the environmental impact of transport.

Assess the environmental and health impacts of road transportation in Male' and enforce measures to ensure that pollution from exhaust gases and cement dust do not reach risk levels.

Develop and implement strategies to reduce the need for motor vehicles in the new growth centres by favouring public transport and providing for safe and appealing bicycle paths and foot-paths.



Establish appropriate land use zoning in Male' and identified growth centres in order to minimise noise pollution and other nuisances in residential area.

Encourage the development of parks, gardens and recreational areas in inhabited islands in order to enhance the quality of the living environment.

STRENGTHENING IMPLEMENTATION

In order to ensure the effective implementation of the second National Environment Action Plan, it is essential to have the necessary legal, institutional and administrative arrangements. The successful implementation of the Action Plan would also be dependent on the financial and human resources available. A number of supporting measures such

as research, information exchange, awareness and environmental education would also be initiated and continued for the purpose of assisting all stakeholders involved in the implementation of the Action Plan.

Environmental Law

The Environmental Protection and Preservation Act of the Maldives (act 4/93) was enacted by the People's Majlis in April 1993. This act established a framework upon which regulations and policies can be developed to protect and preserve the natural environment and resources for the benefit of present and future generations. Act 4/93 consists of:

- *clause 2:* concerned government authorities shall provide necessary guidelines and advice;
- *clause 3:* Environment Ministry responsible for formulating policies as well as rules and regulations;
- *clause 4:* Environment Ministry shall identify and designate protected areas and nature reserves;
- *clause 5:* Environmental Impact Assessment mandatory for any new projects;
- *clause 6:* power to terminate developments causing significantly detrimental environmental impacts;
- *clause 7:* disposal of waste, oil and poisonous substances shall be regulated;
- *clause 8:* disposal and transboundary movement of hazardous wastes banned;
- *clause 9:* fines for damage to the environment;
- *clause 10:* compensation for environmental damage that may take place.

A programme for strengthening of national environmental legislation began in 1996. Under this programme, a national task force has been established to review and take the necessary action to update the national legislation needed to ensure that environmental management in the Maldives has a sound legal basis. The task force will continue its work on the detailed review of the existing national and institutional regime throughout the plan period focussing on identifying policies, guidelines, model laws and regulations required for protection of the environment. Under this programme, a review will also be undertaken of the existing arrangements for ensuring compliance to existing and proposed legislation. On the basis of this review, appropriate legislation, designation of authority and responsibility or other arrangements will be recommended.

The Maldives is party to a number of international conventions and agreements related to the environment. Due attention would be given to meeting the commitments under these conventions and agreements.

Vienna Convention for the Protection of the Ozone Layer (1985);

Montreal Protocol on Substances that Deplete the Ozone Layer (1987);

Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1989);

Agenda 21 and the Rio Declaration of United Nations Conference on Environment and Development (1992);

United Nations Framework Convention on Climate Change (1992);

Convention on Biological Diversity (1992);

South Asian Regional Seas Action Plan and Resolutions concerning its implementation (1994);

Washington Declaration on Protection of the Marine Environment from Land-Based Activities (1995); and

Kyoto Protocol to the United Nations Framework Convention on Climate Change (1997);

In addition, the Government will consider the participation in other relevant international conventions, including:

Convention on International Trade in Endangered Species of Wild Life and Flora;

Prior Informed Consent Convention.

Environmental Administration

As environmental assessment and management activities increase, there will be a continuing need to keep arrangements for environmental administration under review. In order to ensure the timely implementation of environmental legislation, environmental impact assessment procedures, and codes of practice/guidelines, a strong and well co-ordinated institutional set-up would be necessary.

National Commission for the Protection of the Environment (NCPE) will continue its advisory role in national environmental policy formulation and co-ordination of environmental management activities. The NCPE will be further strengthened and restructured.

It is foreseen that the NCPE will establish technical committees that would provide it technical advice. The responsibilities of such committees would include development of environmental codes of practice for tourism, solid waste management, coastal structures, sand and coral mining, fisheries and other areas as well as overseeing their implementation.

The Ministry of Home Affairs, Housing and Environment will be responsible for developing all aspects of environmental policy and enforcement of the Environmental Protection and Preservation Act, 1993. The Ministry will also provide secretariat services for the National Commission for the Protection of the Environment and co-ordinate all national environmental assessment and management activities.

All Ministries and Departments having a role in environmental protection would designate environment contact/focal points for the purposes of liaison and co-ordination. These focal points will also be responsible for overseeing compliance with environmental codes of practice/guidelines within their organisations.

The institutional arrangements for the implementation of the second National Environmental Action Plan would be as follows:

(i) The Action Plan can only be implemented through collaboration and co-operation of all having a role in environmental protection. The Ministry of Home Affairs, Housing and Environment will take the lead in implementing the Action Plan and will work jointly with other Ministries and regulating agencies of the Government and NGOs to meet the objectives of the Action Plan. The Ministry of Home Affairs, Housing and Environment will also be responsible for the development of the biennial work programmes and co-ordinating the implementation of the work programmes.

(ii) The NCPE will be responsible for giving advice on the implementation of the Action Plan and periodic review.

(iii) It is expected that concerned Ministries and Departments will designate focal points for purposes of liaison and communications, as well as to ensure that the activities of the Action Plan are followed within their organisations.

Environmental Awareness and Education

Each individual bears responsibility for environmental protection and this can only be achieved through effective environmental awareness. Translation of awareness into appropriate behaviour is also essential. To raise environmental awareness and foster environmentally sound behaviour, the President's Environmental Award Scheme will be continued over the years as well as nation-wide campaigns similar to the "Two Million Trees Campaign" and the "Independent Maldives - Clean Maldives Campaign" will be conducted. Campaigns to foster environmentally sound behaviour amongst the public with regard to waste minimisation, shopping habits, responsible use of non-renewable resources and transport related aspects will be conducted.

Environmental education as an aspect of general and vocational education is designed to empower individuals to treat nature and the environment in a well-informed and responsible manner. The expansion of secondary school curricula to include more studies on the specific environmental issues



President's Environmental Award Scheme

of the Maldives will be undertaken as well as research to establish sound foundations for environmental education will be fostered. Special efforts will also be undertaken to enhance environmental education in the training of teachers.

Environmental education as an aspect of general and vocational education is designed to

empower individuals to treat nature and the environment in a well-informed and responsible manner. The expansion of secondary school curricula to include more studies on the specific environmental issues of the Maldives will be undertaken as well as research to establish sound foundations for environmental education will be fostered. Special efforts will also be undertaken to enhance environmental education in the training of teachers.

Science and Research

Policies for environmental protection and sustainable development require a good scientific basis. Science has the task of providing knowledge about the state of the environment and its sensitivity to the burdens placed upon it and identifying the potential courses of action for policy-makers. Thus, to implement the second National Environment Action Plan, it is necessary to establish and run an environmental research programme based on an assessment of the needs of the various activities to be implemented under the Action Plan. Government or other bodies and individuals as appropriate will take up the research activities identified.

To facilitate the science and research programme, it will be necessary to:

Develop a national data bank and depository of environmental information and reports, and establish suitable management procedures to ensure the accessibility of data and other information by all Departments of the Government who are concerned with the application of such information.

Interface the environmental research programme with those of other Government Departments in order to maximise the value obtained and avoid duplication.

Merge the relevant environment research units and agencies to develop a national centre of excellence capable of providing scientific and technical expertise, support and advice to Government Departments and others, including provision of tools and methodologies, and guidance on environmental monitoring and assessment techniques.

Provide an efficient national environmental information service including regular publication of state of the environment reports.

Develop a funding mechanism to encourage and foster environmental research.

Human Resource Development

The lack of adequate manpower and resource personnel is a major constraint confronting the Maldives as a whole. This is particularly true in most of the environment related technical and professional areas. A longer-term programme of human resource development, which goes beyond short-term training alone, would be developed within a broader capacity building framework.

In human resource development, priority will be given to establishing and enhancing local expertise in environmental protection and management through tertiary level training, specialised short term training including continued professional development. Trained personnel will be given the opportunity to contribute to their respective professional and technical fields thereby yielding optimal benefits. This will also help ensure the retention of trained personnel.

In addition, priority will be given to providing basic training in environmental assessment and monitoring, such as beach monitoring, to the various field officers in the islands. In an effort to overcome the shortage in trained personnel special consideration will be given to pooling the existing technical expertise available within the country.

A special human resource development programme will be formulated and implemented to achieve the above. It is also envisaged that a project similar to the Capacity Enhancement Project implemented in the first National Environment Action Plan period will be continued and for it funding will be sought.

Financing NEAP2

Financial support for the National Environmental Action Plan will be derived from a number of sources including the national budget, particularly in accordance with provisions of the 5th National Development Plan, from bilateral and multilateral sources and from the private sector.

THE WAY FORWARD



The second National Environment Action Plan is the comprehensive framework that will be used for the next 6 years to ensure environmental protection and sustainable development in the Maldives. To this end, a series of biennial programmes will be formulated and implemented through various Government institutions, private and NGO sectors.

Environmental issues strategies will be developed for tackling specific issues identified in this second National Environment Action Plan. Such strategies or action plans will be developed for

- biological diversity;
- climate change;
- integrated reef resources management including fisheries;
- tourism;
- environmental health;
- coastal zone management.

The key concerns identified in this Action Plan will have to be approached at the level of islands and atolls. It is planned to formulate Atoll Environment Plans, following the objectives and framework set in this second National Environment Action Plan. The Atoll Environment Plans will provide a framework to enable setting of targets at the atoll level, for translation of national policies and priorities into local actions.

As implementation of the Action Plan proceeds these approaches will be used in a concerted way so that responsibility for various activities at different levels of society and Government will be clear thereby ensuring that priority issues are addressed, as, and where appropriate.

A set of indicators will be used to monitor the success in the implementation of this Action Plan and progress reviews will be undertaken every two years.



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