MINISTRY OF ENVIRONMENT, AGRICULTURE AND FISHERIES
STUDY AND PLANNING UNIT

Second National Environmental Action Plan

ABRIDGED VERSION

Praia, March 2004

1. INTRODUCTION

The Main Options of the current Strategic Agenda (Grandes Opções do Plano, 2001-2005), define Cape Verde's future as being "A country open to the world, with a strong and dynamic production system based on valorising its human capital, technological capacities and culture. A society characterised by solidarity, peace, social justice, democracy, openness and tolerance. **A country endowed with a regionally, environmentally and aesthetically balanced sustainable human development, based on a profound ecological awareness.**

The Government's medium term policies are oriented towards an economic environment that encourages growth, reduces poverty and respects the environment and gender equity.

In this context, the Government elaborated the Second National Environmental Action Plan (PANA II), which has a 10-year horizon (2004-2014). The Plan's general objective is to provide the country with a strategy that promotes a rational use of natural resources and a sustainable management of economic activities. PANA II intends to respond to Cape-Verde's topographic and agro-ecological diversity, which is reflected in the different environmental concerns and opportunities in each municipality.

The document identifies as priority environmental problems:
i) the limited availability of water suitable for home consumption and economic development activities;
ii) the loss of marine and terrestrial biodiversity;
iii) the poorly developed basic sanitation infrastructure that considerably affects public health and tourist development.

PANA II incorporates the development orientations adopted at International Meeting on Sustainable Development held in Johannesburg in 2002.

By means of a transversal, participatory and decentralised process, involving public and private sectors, municipalities, Non-Governmental Organisations and other civil society groups, four priority interventions were identified:
i) Sustainable management of water resources:
ii) Basic sanitation,
iii) Biodiversity and
iv) Spatial planning.

In addition, several implementation instruments were outlined of which environmental education, institutional development (including an environmental information system) and environmental legislation, regulation and law enforcement were highlighted.

The adaptation of the institutional and legal framework is the main priority for next few years as these two aspects are essential to respond to environmental problems and, above all, stimulate and guarantee the intersectoral and transversal approach to programme and project implementation

In the Thematic international Stakeholder Meeting of April 2004, the Government intends to continue the dialogue with its partners on the implementation of the second National Environmental Action Plan, the adoption of a new financing mechanism and the administration and implementation modalities of the priority programmes.

1.1 Environmental policy development

Since independence, successive Cape-verdean governments have shown their concern for the protection of its ecosystems and the creation of institutions engaged in environmental management. These concerns may be demonstrated by the Republic' s Constitution which indicates the rights of every citizen to a healthy, ecologically balanced, living environment) and by the Main Options of the current Strategic Agenda (Grandes Opções do Plano, 2001-2005). In addition, the Government of Cape Verde has ratified various international conventions and published a series of environmental laws.

As a follow up to the Environmental Base Law (Law nº 86/IV/93), in 1994 the First National Environmental Action Plan (PANA I) was elaborated, with a ten-year horizon (1994-2004). Subsequently, in 1995, the Executive Secretariat for the Environment (SEPA) was created as the agency responsible for environmental policy development.

Although PANA I was never formally approved or disseminated it triggered some awareness and concerns leading to various national plans featuring environmental concerns. In 2002, SEPA was closed down and in its place the General Directorate for the Environment, was created as one of the three directorates within the, now, Ministry of Environment, Agriculture and Fisheries.

Late 2001, a start was made with the elaboration of the second National Environmental Action Plan (PANA II), to provide the Cape-verdean government as well as its international partners with a coherent framework for environmental interventions for the next 10 years. Moreover, PANA II as a whole would have to be prepared in such a way that the end result would not only be known and supported by the public services, but also recognised and shared by the entire Cape-verdean population, including the private sector.

PANA II incorporates the development orientations adopted at International Meeting on Sustainable Development held in Johannesburg in 2002.

1.2 Significance and justification

The island state of Cape Verde is ecologically fragile. The production capacity of its subsistence agriculture is insufficient to meet the populations food needs. Due to its scarcity in natural resources, the country needs to adopt a policy of sustainable resource management.

The environment in which human beings live, and on which they depend for their economic activities, is a complex interaction of physical, ecological, economic, social political and institutional dimensions. PANA II takes into consideration this multi-dimensional perspective. In addition, it responds to Cape Verde's large topographic and agro-ecological diversity that causes each municipality to have its own priority environmental concerns and opportunities.

The multidimensional perspective has been taken as a point of departure for the elaboration of PANA II, taking into consideration the implications of development interventions on the environment as well as on society. Consequently, PANA II was developed decentrally, with the participation of all municipal actors integrating their visions and expectations.

PANA II deals with environmental policies and strategies transversally, not in isolation, and involves those who use the environment: the public service, the private sector and the civil society as a whole.

1.3 Objectives

The general objective of PANA II is providing for a strategic orientation to guide the rational use of natural resources and sustainable management of economic activities. More specifically PANA II aims to:

- Define the main political orientations for environmental and natural resources management;
- Identify environmental opportunities and development priorities;
- Identify interventions that facilitate an effective and efficient natural resources use;
- Define the institutional setting and the necessary intersectoral co-ordination mechanisms;
- Promote the integration of the environmental concerns in socio-economic development planning;
- Promote the improvement of the population's living and livelihood conditions.

1.4 Elaboration process

The PANA II elaboration process consisted of two phases.

The first one (in early 2002) aimed at facilitating the integration of priority environmental concerns into the National Development Plan that was being elaborated at that time. It consisted of a document study and some discussions at national level, and resulted in a strategic plan (PANA Estratégico, April 2002). PANA Estratégico identified four priority areas (water resources management, sanitation, biodiversity and spatial planning) and outlined various implementation instruments of which education, information, and environmental legislation, regulation and law enforcement were highlighted. In addition, it put forward some suggestions for the second phase.

This second phase (October 2002- March 2004) emphasised a participatory and decentralised elaboration process to ensure the involvement of those that will be responsible for the implementation of Cape-verdean environmental policies: the public and private sectors as well as the civil society.

O MAAP decided to approach the elaboration of PANA II along four lines but with frequent interactions between these sub-processes:

- The preparation of six environmental plans by a representative group of six municipalities by intersectoral municipal working groups using an intensive participatory diagnostic, analytical and planning process based on the Strategic Environmental Analysis (SEAn) approach[1]
- The elaboration of nine intersectoral plans by nine national-level intersectoral working groups, using some elements of the SEAn approach.
- The implementation of seven-base studies by national and international consultants, compiling and analysing information on priority environmental themes and preparing management plans and verification guides.

[1] as developed by AideEnvironment and SNV, The Netherlands, 2002

- An environmental sector analysis to determine appropriate institutional structures at national and local levels, to co-ordinate and monitor the implementation of environmental policies and, if necessary, adapt them.

PANA Estratégico was used as a reference guide to start up and guide the process. In addition, the various working groups identified ongoing and planned environmental interventions and programmes, be it those with guaranteed funding or those in the pipeline. These programmes were assessed against the background of the overall environmental problem analysis to verify to which extent they contribute to the solution of priority problems.

This process facilitated an in-depth analysis of the interrelationship between problems and of sectors responsible for the root causes of these problems, thus identifying those responsible for its solution.

The thematic base studies supported the environmental and socio-economic diagnoses and analyses and resulted in several additional programmes.

Subsequently, a coherent set of programmes was identified, including those ongoing and previously planned, and a (provisional) standard environmental impact monitoring system set up.

1.5 Document Structure

The PANA II document consists of 6 volumes, including numerous subdocuments

Volume I	Main text and annexes
Volume II	Report of the Institutional Sector Analyses
Volume III	Intersectoral Environmental Plans (PAIS) - Volume III-1 to III-9
Volume IV	Municipal Environmental Plans (PAM) - Volume IV-1 to IV-17
Volume V	Thematic base studies - Volume V-1 to V-7
Volume VI	Methodological note.

Volume I, the main text, synthesises the subdocuments and provides the total overview of environmental problems and opportunities; it describes the institutional and legislative context and implementation constraints. The next four volumes include all subdocuments referred to in the main text (institutional analysis, municipal environmental plans, intersectoral plans and thematic baseline studies). Volume VI is a methodological note, explaining the elaboration process and as such providing the basis for future revisions of PANA II.

2 THE CAPE VERDEAN ENVIRONMENT

2.1 General information

Cape Verde is an island state of ten islands and thirteen islets, located at some 450 km from the coastline of Senegal. It has a land area of 4033 km^2 and an exclusive economic zone (ZEE) of about 700.000 km^2. Of its population of about 450.000 (giving a population density of 108 inhabitants per km$^{2)}$ some 54% lives in urban areas. The population is very young (42% is below the age of 14) and has a growth rate of 2.4%.

The country has an arid subtropical climate reaching relative humidity levels of less than 10 %. The very short rainy season lasts from July to October, is characterised by, often torrential, rains that are poorly distributed in space and time and result in an annual average of about 225 mm. Since the 1960s rainfall has decreased, negatively influencing agriculture production and water availability. About 20% of rainwater is lost through soil erosion, some 67% through evaporation and the remaining 13% is available for ground water recharges. (General outline of water resources, 1992, as quoted in the intersectoral plan Environment and Sustainable Water Resources Management).

The majority of soils are low in organic matter and only about 10% of the Cape-verdean land area is arable, with 95% thereof being used for rainfed agriculture and the remaining 5% for irrigated crops (Intersectoral Plan: Environment and Agriculture, Forestry and Livestock production).

2.2 Current environmental values

An overall environmental concern is the decrease in natural resources (water, biodiversity, soils and marine resources, Appendix 1). These resources are assessed in relation to specific environmental functions, defined as the goods, services and other specific spatial uses that the environment has to offer to mankind and classified in as productive, carrier, regulatory/protective and information or cultural functions.

Water

- *Potable water* availability is declining in seven of the seventeen municipalities. In the ten other, however, availability is rising partly due to the sinking of new boreholes and water harvesting and partly due to the installation or increased capacity of water desalination plants.
- In terms of *water quality*, S. Vicente, Sal and Praia (which provide for about 50% of domestic water needs) have the least problems because of a good water quality control system. In the other municipalities of Santiago Island, and on the San Antão, S. Nicolau and Maio Islands, water quality is decreasing, mainly in the coastal zones, due do to the infiltration of seawater.
- Overall, *groundwater and surface water levels* are decreasing, leading to a considerable negative impact on agricultural, livestock and industry development.

Biodiversity

- On all islands, except for Fogo due to its Natural Park, the area under vegetation as well as the diversity of vegetative population is decreasing. In addition, the number of endangered and already extinct species is increasing rapidly.
- On the other hand, the area under forest is gradually decreasing except on the island of Sal, where no changes occur.

Soils

- To measure soil quality and land availability, the areas under three land use types are used as indirect indicators: 1) forest-livestock systems, 2) rainfed agriculture and 3) irrigated agriculture. Table 2.1 summarises this information for all 17 municipalities

Table 2.1 Changes in land use for Cape Verde, per island

Land use type	Increase in area	Decrease in area	No changes
Forestry-livestock	S. Antão, S. Nicolau, Maio, Brava.	All others	Santiago e Sal
Rainfed agriculture	S. Nicolau, Maio	All others	None
Irrigated agriculture	S. Vicente, Fogo, Santiago	All others	None

Sources: PAM Ribeira Grande (2003); PAM S. Vicente (2003); PAM S. Filipe (2003); DGASP (Reports of the Directorate of Forestry Services and the Directorate of Silviculture Services, 1998 – cited by Marta and Varela (1998)).

Marine resources

To measure the current marine resources situation, four indirect indicators are used. Their values are presented in Table 2.2.

Table 2.2 Indirect indicators for marine resources quality and their current values in Cape Verde

Indicator	Current values
Fishery production - industrial sector	Stable at 939 kg/per day at sea over the period 2000-2001
Fishery production - small scale sector	5.649 ton in 2001, indicating a decrease of 19% over the period 2000-2001
Small scale fishing trips	Increase from 140.000 to 150.000 fishing trips per year over the period 2000-2001
Fish consumption levels	increase of 60% over the period 1990 - 2000
Coastal zone pollution rate	Increasing in all municipalities

Source: PAIS Environment and Fisheries (2003), PAIS Environment and Sustainable Biodiversity Management (2003).

General environmental qualities

- Environmental pollution is a major national concern. It does not only negatively affect health, it also decrease the esthetical values of the environment and consequently influences tourism development.
- Main indicators for environmental pollution are the presence of used oil in the soil, the dispersion and accumulation of non-degradable solid waste in waste dumps, the accumulation of vehicle exhaust gasses (mainly in urban centres) and of aerosols (dust and sand) in the air.
- Unfortunately all these aspects of environmental pollution are on the increase in all municipalities. The only exception is S. Vicente, partially due to the involvement of Garça Vermelha, a NGO that collects and stores used oil.

2.3 Environmental problems, their causes and effects

Although overall climatic changes also play a role, Cape Verde's main environmental problems, that practically all islands have in common, result primarily from an inadequate management of natural resources in rural as well as in urban and peri-urban areas. Inadequate natural resources management in its turn is caused by the change from a planned to a liberalised consumption economy in which socio-economic changes are not yet adequately implemented.

Soil degradation in rural areas

- The degradation of soil quality is inherent to Cape Verde's geographic position and enhanced by high rainfall intensity and poor rainfall distribution.
- The lack of adequate spatial planning and land use has lead to a haphazard urban development and a high demand for agricultural lands. Ever increasing soil losses due to wind and water erosion add to the land pressure.
- A complex mix of causes (such as overstocking, uncontrolled extraction of inert materials, high density of wells, production of annual crops on steep slopes, uncontrolled construction, a proliferation of informal-illegal waste dumping sites and indiscriminate pest and fertiliser use) exacerbates soil degradation. In addition to having a direct negative impact on soil properties, these activities reduce the effectiveness of soil and water conservation measures.

Urban soil pollution

- The lack of infrastructure for basic environmental sanitation, a population with insufficient environmental education and a lack of well-defined environmental norms that regulate commercial and industrial activities contribute to waste accumulation, resulting in soil pollution.

Coastal zone pollution

- Although coastal zone pollution is not yet a priority problem, there is an increased pollution risk due Cape Verde's geographic and strategically interesting position that provokes intensive national and international traffic in its territorial waters and, consequently, results in marine and coastal zone pollution.
- Solid waste, effluents and used oils regularly are dumped in national waters near coastal areas and in bays. The low capacity of commercial and national fishing vessels, the limited action radius and, in national ports, the total lack of appropriate installations for the collection of waste are the main causes of this dumping. The fact that commercial vessels and fishing boats are not required to be equipped with on-board installations to separate used oil from other effluents increases the problem.
- None of Cape Verde's ports has a contingency plan to deal with problem situations and oils spills such as the October 2003 oil spill in Baía de Galé, S. Vicente Island.
- The direct discharge of urban wastewater in the sea increasingly contributes to coastal zone pollution.

Water pollution

- The reduction of water quality for all types of uses is linked to salinisation of groundwater in the coastal zones, as the direct result of overexploitation of groundwater (linked to high density of wells) and of sand extraction in coastal areas destroying the natural barriers against salt-water intrusion.
- The lack of knowledge among consumers about the need of sustainable water use and their own responsibility in this matter once again can be ascribed to deficiencies in environmental education.

Air pollution

- In Cape Verde, air pollution is limited. However, due attention has to be given to the exponential increase in vehicle numbers that in the last couple of years has contributed to a diminished air quality mainly in urban centres.
- In addition, air pollution through Sahara desert dust ("dry mist") has increased over the last decade in terms of intensity and duration, with subsequent negative impact on public health and air traffic.

Landscape degradation

- Landscape degradation reduces the environment's esthetical and cultural values that are important for tourist development as well as for the well being of Cape Verde's own population (for instance the destruction and even total collapse of beaches, due to the extraction of sands for civil construction).
- Among the various causes of landscape destruction, the extraction of inert materials, poor agricultural and forestry practices, uncontrolled urbanisation and infrastructure development in less suitable areas, feature prominently.

Biodiversity decline

- The main causes that underlie the decline in Cape Verde's biodiversity are:
  - agricultural production in areas unsuitable for agricultural purposes;
  - inadequate practices for irrigated agriculture;
  - overstocking and related vegetation cover losses;
  - inappropriate use of pesticides and fertilisers;
  - the introduction of exotic species;
  - soil and water pollution;
  - the uncontrolled extraction of sand;
  - habitat destruction;
  - overexploitation of (endemic and introduced) species for communal grazing, fodder and firewood collection;
  - use of toxic materials in ship maintenance;
  - use of explosives and draglines in fishing activities;
  - the overexploitation of marine resources;
  - an uncontrolled capture of turtles, lobsters and birds.

Waste accumulation and dispersal

- Although municipalities have made major efforts to improve waste collection, its further treatment still leaves a lot to be desired, as well-designed treatment systems are lacking. The dispersal of solid waste in public areas and its accumulation in unofficial dumping sites continues.
- This environmental pollution constitutes a serious risk to public health, in particular in urban centres.

2.4 Interrelationship between environmental and socio-economic problems

There is no doubt that the lack of national and municipal land use plans is the root cause of Cape Verde's main environmental problems.

Linked to this, in rural areas, two others causes off environmental degradation are identified: inadequate agricultural practices and overstocking in the different agro-ecological zones. A direct effect are the soil's reduced water infiltration and retention capacities, leading to lower ground water tables. A second, indirect, effect

are the reduced agricultural and livestock production capacities. This in its turn stimulates further overexploitation of natural resources and extraction of inert materials of which communities become dependent for their income generation. As outlined in the previous sections, overexploitation leads to loss of biodiversity, reduced water quality for all uses, decreased tourist interest and, consequently, to a reduction of sources of rural income, mainly in the coastal areas. Urban migration of citizens in search of income is the logical consequence.

Due to the lack of urban development plans, migrant settlement in peri-urban areas is not controlled, provoking clandestine construction of infrastructure and a lack of waste management and basic sanitation, resulting in a negative impact on public health. Further analysis shows that the accumulation of waste in rural and urban areas negatively affects tourist development and thus reduces income-generating opportunities.

The rural exodus and inter-island migration provokes increase civil construction, increases the need for construction materials which in its turn once again increases pressure on natural resources.

The analysis above demonstrate the socio-economic dimensions of environmental management and protection and hence of sustainable development. Institutional measures are necessary to create alternative opportunities for income generation and improve practices for agricultural, livestock and forestry production. These improved practices should not merely aim at improving yields but also at maintaining current yield levels, while minimising environmental degradation and stimulating a sustainable use of natural resources.

2.5 Priority problems

In terms of technical content, priority problems are:
- The limited water availability, suitable for home consumption, tourist industry, irrigated agriculture and industrial purposes;
- The loss of marine and terrestrial biodiversity;
- The poorly developed basic sanitation infrastructure that considerably affects public health and tourist development.

The root causes of most of these problems are:
- Inadequate spatial rural and urban planning and the lack of adequate, smaller-scale, maps;
- The absence of environmental indicators, norms, optimal values and thresholds and the lack of basic data on current values, constraining the monitoring of environmental quality changes and the enforcement of environmental laws;
- Inadequate environmental education, training, information and awareness raising;
- Inadequate legislation, regulation, environmental fiscal control and the dissemination of national environmental laws;
- A weak technical and administrative capacity among national and municipal public services concerning environmental issues.

2.6 Environmental potential

In spite of all its environmental problems, Cape Verde also has various environmental opportunities that could and should be explored in a sustainable manner:

- 181 million cubic meters of annual rainfall that currently is lost through surface erosion but could be captured or stored by means of adequate measures;
- Marine resources and a coastal zone that have production potential in terms of food, salt, energy and a potential for aquaculture and tourist development;
- Cape Verde's biodiversity that presents great opportunities in terms of varietal richness and which, through the protected areas, offers scientific and tourist values;
- Its varied landscape that offers great potential for ecotourism as well as for beach holidays;
- Sun, sea and wind as sources of renewal and clean energy;
- Forest resources that play a role in the combating desertification, increases the soil's capacity for water infiltration and retention, improves the landscape and may provide, through appropriate interventions, secondary materials and income sources for the rural population.

2.7 Institutional aspects

The institutional integration (mainstreaming) of environmental issues is relatively new. This translates in the need for specific measures aiming at strengthening and consolidating the institutional framework and for the development of management tools and instruments to monitor the implementation of environmental policies.

The institutional dimension of the sector may benefit from the following strengths:
- An increasing environmental awareness among politicians;
- A significant development of associations and NGOs;
- An increasing interest in environmental development on the international agenda and in bilateral and multilateral co-operation,
- National research institutes that have an adequate level of human and technical capacity to accumulate and transfer knowledge.

The adaptation of the current institutional structure to one that is equipped to provide answers to environmental problems, motivate those active in the sector and, above all, assure the effectiveness of national environmental politics and action plans is a top priority for the coming years.

2.8 Legislation

Cape Verde has a normative legal framework that is all encompassing and includes various laws and references to environmental aspects. It demonstrates that the legislative powers are greatly concerned with protecting the environment and maintaining the ecological balance. However,
- The laws that have been passed over the last two decades are barely disseminated, and therefore little known, neither by the general public nor by civil servants;
- Most citizens are not really interested or used to find out more about environmental laws.

Recommended priority measures are:
- The elaboration of an Environmental Code or, at least, of a comprehensive overview of environmental legislation, including comments and explanations to be used as a dissemination tool for Cape-verdean environmental laws;
- The implementation of environmental law extension campaigns;
- The development of a legal statute that regulates the framework in which associations and NGOs may operate to facilitate their involvement in the dissemination and enforcement of relevant laws.

- The preparation of detailed regulation for the various laws, in particular for those for which norms already exists but cannot be implemented due to the lack of such regulations.

3 VISIONS AND STRATEGIES

3.1 Visions

To ensure continuity in national environmental policiess, PANA II has adopted as its overall environmental vision the one formulated by SEPA, in 1999, and which contributes to the national development vision, integrated in the Main Options of the current Strategic Agenda (Grandes Opções do Plano, 2001-2005)

Development vision

- A country open to the world, with a strong and dynamic production system based on valorizing its human capital, technological capacities and culture.
- A society characterized by solidarity, peace, social justice, democracy, openness and tolerance, with a regionally, environmentally and esthetically balanced development, based on a profound ecologic awareness**.**

Environmental vision

- A society aware of the role of the environment in sustainable economic and social responsibilities towards future generations, determined to use the country's natural resources in a sustainable manner

Guided by the overall environmental vision, each municipality based its strategic and operational plan on a municipal development and environmental vision with a ten-year horizon (Appendix 2). Likewise, the nine intersectoral plans have developed their individual thematic visions, contributing to the overall national environmental and sustainable development visions (Appendix 3).

As emphasised in PANA Estratégico (DGA, April 2003), the operationalisation of this ten-year vision requires an integrated approach that:

- Emphasises those interventions that: 1) facilitate natural resource, biodiversity and coastal zone conservation and protection, 2) mitigate the results of climatic vulnerability and 3) increase and protect forested areas; and, 4) improve all aspects of the urban environment;
- Supports spatial and temporal planning and promotes the systematisation and dissemination of information and as such provides a progressive knowledge base needed valorise as well as protect environment;
- Guarantees a synergy with poverty eradication and promotes equity;
- Organises and reinforces the intervention capacity of national and local level authorities, civil society and the commercial sector, in a united and complementary effort;
- Clarifies the respective responsibilities and roles of all actors involved in sustainable development;
- Reinforces partnerships with the private (commercial) sector and clarifies its role;
- Attunes various interests and reinforces civil society's awareness, hence participation, through environmental education, training, provision of information and awareness raising;
- Assures a harmonisation of the social and economic sectors' environmental policies;
- Encourages scientific research and technology development;

- Generates and makes available adequate financial and technical means.

The elaboration of the nine Intersectoral and six Municipal Environmental Plans initiated this integrated approach, which will be enhanced through the further development of intersectoral and central-local implementation arrangements and collaboration protocols (foreseen for the first year of PANA II implementation).

The subsequent integration of environmental strategies in national, regional and municipal development plans will ensure a sustainable economic and human development in all its dimensions.

4 INTERSECTORIAL ENVIRONMENTAL PLANS

The environmental sector is multidimensional and transversal. To ensure a harmonisation between sectoral plans, avoid duplications and the risk of omitting essential strategic options, nine Intersectoral Environmental Plans (PAIS) were prepared. The plans deal with the following environmental themes:

- Environment and sustainable management of water resources;
- Environment and public health;
- Environment and biodiversity;
- Environment and land use planning, land use, ports and infrastructure;
- Environment and education, training, information and awareness raising;
- Environment and Tourism Development;
- Environment and Agriculture, Forestry and Livestock keeping;
- Environment and Fisheries;
- Environment and Industry, Energy and Trade.

Intersectoral working groups (one for each theme) were set up to prepare these plans in close collaboration with the PANA II Co-ordinating Team. Due to this approach, the Intersectoral Environmental Plans are recognised and shared by those actively and indirectly involved in preparing them and, consequently, by those who constitute the main implementation force.

The elaboration process included a problem and opportunity analysis followed by an assessment of current and planned programmes, with or without guaranteed funding, to determine their capacity of addressing identified problems and opportunities. For each intersectoral plan a thematic environmental vision was formulated. The plans provide strategic orientations that, in addition to presenting concrete programmes and interventions, provide the basis for the development of sectoral programmes and work plans that duly integrate environmental concerns.

In addition to these PAIS, seven thematic base studies were carried out:

- Impact of the extraction of inert materials in Cape Verde;
- Alternative construction methods to reduce the of sand in civil construction and public works;
- Fishery resources management plan;
- Solid waste management plan;
- Environmental Quality Monitoring System;
- Impact of PANA II on gender and poverty;
- Legislation, regulation and law enforcement tools for the environmental sector.

The results of these studies contributed to the intersectoral and municipal environmental plans and their conclusions and recommendations are integrated in the PANA II main text (Volume I). Furthermore, the thematic base studies resulted in proposals for three additional studies: *Viability study on the import of sand from*

the African Continent, Preparation of a management plan for waste water, Study into the current stock levels of aquatic species.

The intersectoral environmental plans, PAIS, include the following priority orientations:

Sustainable water resource management

- The highest priority is given to the mobilisation of water resources, the construction of infrastructures that facilitate the population's access to clean and good quality drinking water and the reduction of water losses in agriculture. The protection of water resources against pollution also constitutes a priority.

Public health

- Prioritised are preventive measures to control infectious and parasitic diseases, (diarrhoeas, malaria, tuberculosis among others) and hospital waste management.
- In the same context, a thematic base study further deepened the diagnosis of the waste management problem. The sequence of concrete interventions in waste management emphasises: waste reduction, legislation, identification and proper management of waste dumps, as well as the implementation of viability studies for the reuse and recycling of waste.

Biodiversity

- The sector's priority is improving the knowledge base about all aspects of marine and terrestrial biodiversity, aiming at valorising and in-situ preservation of Cape Verde's biodiversity.
- Terrestrial biodiversity management is closely related to water resources management, the modernisation of agriculture, forestry and livestock production and the promotion of income generating activities and, consequently, with the reduction of poor agricultural practices, uncontrolled exploration of natural resources and extraction inert materials.
- As far as marine biodiversity is concerned, priorities focus on improving the knowledge base about marine species, emphasising endangered and endemic species, and on a rational management of the coastal zone and marine protected areas.

Spatial planning

- Priority programmes are the elaboration of land-use and urban development plans, the set up of a National Cadastre, the creation of a Land Use Information System, the production of digital maps, the rehabilitation and modernisation of the National Geodesic Network and technical capacity building.
- As a result of the thematic study *Alternative construction methods to reduce the use of the sand*, two follow-up studies are deemed essential: a viability study about the implications of the importation of sand from the African Continent and a study to determine the impact of sand extraction form the sea bed.

Education, training, information and sensitisation

- The sector has prepared a vast environmental education programme not only for all formal teaching levels but also for the general public. The main objective of this programme is instilling in all social groups a sense of environmental responsibility. The programme also expects to support the identification of more appropriate measures to solve or prevent environmental problems. In addition to this intersectoral plan, all PAM and the remaining eight PAIS include specific references to thematic programmes for education, training and environmental communication. NGOs in particular will play an essential in awareness raising campaigns.

Tourism

- The sector intends to develop, for the entire country, a sustainable tourism industry that takes into consideration the specific potentialities of each region and ensures a positive impact on overall sustainable socio-economic development.
- Emphasised are programmes that facilitate:
  - The diversification of national tourist products and increased efforts to promote ecotourism as well as sun-and-beach and mountain holidays;
  - The development of a better system of environmental control in tourist areas, to guarantee tourists' safety and, in particular, the preservation of indigenous biodiverstiy and other environmental values;
  - The integration of environmental concerns in professional training programmes, not only for tourist guides but also of all other staff and managers in the sector;
  - The reduction of the negative impact of tourist activities: waste production and management, treatment of residual water and the location and construction of hotel, restaurant and other tourist facilities.

Agriculture, Forestation and Livestock

- In agriculture, in particular in the rural zones, short, medium and long term integrated interventions are prioritised that focus on the investigation and introduction of more profitable and sustainable agricultural practices and technologies to solve the multiple problems that directly and indirectly affect the rural population.
- In addition, the search for alternatives for firewood and other biomass products receives priority.

Fisheries

- In fisheries, the main priorities are a rational management of fishery resources and the promotion of product quality.
- Training of fishermen and others involved in the fishing industry, at all levels, is another priority. The training will focus on increasing the trainees' knowledge of natural processes and human development that may be developed through an adequate coastal zone planning and allow a maximal but sustainable utilisation of fishery potential.
- The Fishery Management Plan, elaborated as part of a thematic base study, introduces a series of concrete measures and identifies essential baseline data needed to enhance the plan and to monitor the impact of the improved fishery management.

Industry, Energy and Trade

- The energy sector focuses its efforts on rural energy supply through the use of renewable resources (wind and solar energy) and on promoting domestic energy programmes to reduce firewood consumption.
- The industry sector emphasises the need of implementing environmental impact studies of (already established) national industries to identify and catalogue the current situation.
- The trade sector prioritises the problem of high levels of solid waste production, due to the unlimited import of non-degradable and non-returnable packing materials. The revision of legislation and strengthening of environmental law enforcement, the integration of Cape Verde into the World Trade Organisation (WTO), stimulating commercial co-operation in reducing environmental problems and participation in CEDEAO activities are the sector's priority orientations.

5 MUNCIPAL ENVIRONMENTAL PLANS

The Constitution of the Republic of Cape Verde stresses the rights of its citizens to a healthy ecologically balanced living environment atmosphere and at the same time their obligation to protect and to conserve it.

Environmental protection is each and everyone's responsibility, applying the principle «*A Better Environment Starts With Me*». Solving environmental problems and exploring, in a sustainable manner, the country's environmental potential is therefore best achieved by means of a decentralised and participatory process, in which the population is truly made responsible. This principle constitutes the basis for the decentralised elaboration and implementation of Municipal Environmental Plans.

Cape Verde has seventeen municipalities. In a first phase, six municipalities were selected to prepare their environmental plans (Table 5.1). This selection was based on predefined criteria such as overall representation of the country's environmental situation and available technical capacity at municipal level.

Table 5.1 The three phases of elaborating Municipal Environmental Plan

Phase 1	Boavista, Praia, Ribeira Grande, Santa Cruz, S. Filipe e S. Vicente
Phase 2	Maio, Paul, Porto Novo, Sal e S .Nicolau
Phase 3	Brava, Mosteiros, S. Domingos, S. Miguel, Santa Catarina e Tarrafal

Municipal environmental teams were created to co-ordinate the elaboration the environmental plans. The National Association of Cape-verdean Municipalities (ANMCV), through its Environmental Team, specifically created for this purpose, and the PANA II Co-ordinating Team provided the municipal teams with the necessary analytical and technical assistance.

The planning process, consisted of the following main steps:
- Participatory diagnostics of local environmental problems and potentialities;
- Problem and opportunity prioritisation and analysis;
- Identification of strategic orientations and priority programmes;
- Plan restitution and validation at municipal level.

Towards the end of the planning process, a national two-day meeting was held to determine whether problems identified and plans elaborated by the six municipalities could be extrapolated to national level and in this way facilitate a justified estimation of necessary funding for all seventeen municipalities.

In the six municipal plans already elaborated, sustainable natural resource management (water, soils, biodiversity) and waste management are given top priority. Spatial planning, institutional and technical capacity building and educational programmes (formal education, professional training, information and awareness training) are an essential basis to the implementation of technical programmes.

The same issues are priorities in all municipalities, albeit with a different relative importance (Appendix 4). PANA II Volume I presents these priority problems and related interventions in detail.

6 IMPLEMENTATION CONDITIONS

To consolidate the implementation of environmental policies, it is deemed necessary to organise the institutional aspects of the environmental sector on the basis of the following principles:

- The 'socialisation' of environmental issues;
- The participation and integration of all actors in the implementation process and a well co-ordinated environmental management;
- Well established relationships between environmental management and spatial planning;
- Decentralisation as an essential requirement for the development of environmental policies;
- The creation of a stable and sustainable environmental capacity at various levels;
- The gradual and realistic transformation of existing administration structures into competent co-ordinating teams;
- Learning and transfer of knowledge, through *learning by doing*, as a main priority.

It is emphasised that the Environmental Policy Base Law, explicitly links the environment to spatial and economic planning.

At national level, the following entities are proposed.

- A National Council integrating the Ministers responsible for the departments represented in the Steering Committee and contributing to policy formulation and implementation;
- A Central Co-ordinating Entity being the Directorate General for the Environment
- A Steering Committee bringing together representatives of relevant General Directorates and Research Institutes, the Local Authority's Central Co-ordinating Structure and the National Association of Cape-verdean Municipalities (ANMCV);
- Focal Points for the Environment in all government departments and institutes with adequate competencies and knowledge to represent and monitor sectoral environmental issues;
- A Consultative Council consisting of representatives of the private sector, civil society, other public organisations and international stakeholders.

The Central Entity - the Directorate General for the Environment- is primarily responsible for drafting policies and programme and for motivating, co-ordinating and supervising their implementation (Figure 6.1).

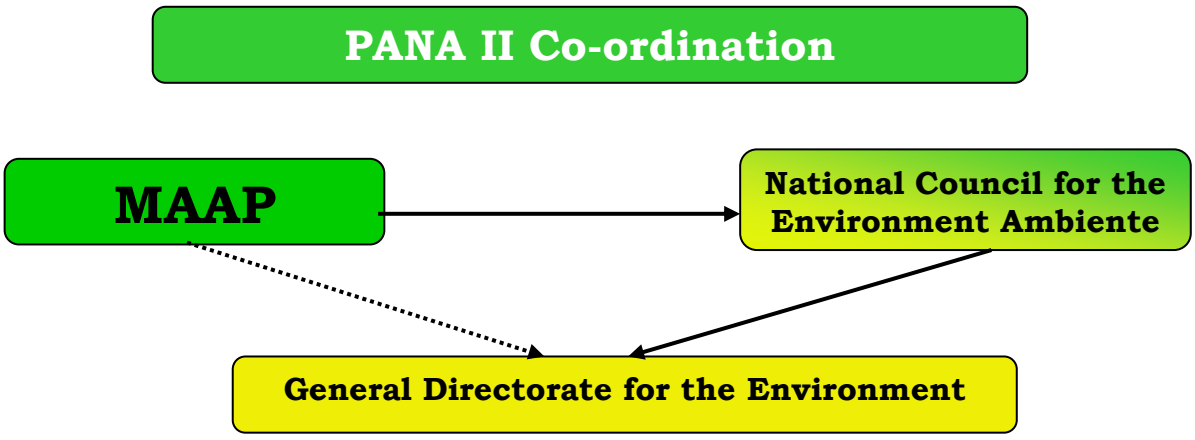

Fig 6.1 Organogramme of PANA II Co-ordination

The establishment and operation of the National Council for the Environment with an additional integration of the private sector and the civil society, will ensure an continued involvement of all sectors with direct or indirect environmental responsibilities, be it political or technical, at municipal, national and international levels.

The linkages between the various sectors will be guaranteed by means of a network of focal points with the responsibilities of:
- Co-ordinating sectoral participation in the implementation of intersectoral plans;
- Creating environmental awareness among sectoral staff
- Representing the sector in environmental meetings and conferences
- Communicating information about and results of sectoral environmental activities, internally as well as externally:

7 IMPLEMENTATION AND MONITORINS

7.1 Overall Logical Framework

The overall Logical Framework (Table 7.1) is a combination of visions, strategic orientations and objectives identified as part of the intersectoral and municipal environmental plans. It uses as overall development goal, Cape Verde's sustainable development vision and as specific objective the environmental vision formulated in the context of PANA I. The visions of each environmental theme were summarised and subsequently formulated as expected results.

7.2 Implementation

The year 2004 marks the beginning of PANA II implementation. To facilitate this, the following is necessary:
- Institutional development activities, in particular:
  - The operationalisation of the Central Entity;
  - The establishment of an Environmental Quality Monitoring System (SSQA) and the revitalisation of the existing Environmental Information System (SIA);
  - The elaboration, jointly with the Ministry of Planning and Finance and international partners, of a harmonised, transparent and concise system of financial and administrative management;
  - The establishment of a National Library on the Environment;
  - The elaboration of Logical Frameworks and related annual and pluri-annual work plans;
  - The detailed elaboration of project sheets, including the specification of relevant various implementation and environmental indicators;
  - Negotiations between actors involved in intersectoral activities and the subsequent preparation and signing of collaboration protocols;
- The implementation of recommendations put forward in thematic base studies and elaborated management plans.
- The elaboration of implementation and monitoring manuals and of guidelines for strategic sectoral planning to ensure the mainstreaming of environmental issues in future plans.
- The elaboration of Municipal Environmental Plans for the remaining eleven municipalities.
- The revision and improvement of Intersectoral Environmental Plans.
- The dissemination of PANA II and its subsidiary plans.

Table 7.2 presents a tentative implementation calendar.

Table 7.1 PANA II Logical framework

Overall objective	**Indicators**	**Sources of verification**	**Assumptions**
A sustainable economic and social development	In 2013, improved socio-economic indicators	▪ World Bank's Annual Development Reports	▪ No changes in national and international environmental policies
Specific objectives	**Indicators**	**Sources of verification**	**Assumptions**
A society aware of the role of the environment in sustainable economic and social responsibilities towards future generations, determined to use the country's natural resources in a sustainable manner	▪ In 2013, values of main indicators improved with at least 15 % ▪ In 2013, the environmental knowledge level of all social classes and age groups improved with at least 50%	▪ Results of bi-annual national environmental surveys ▪ Annual reports on changes in environmental quality	▪ A sensitised Government ▪ Dynamism and strong, intersectoral, collaboration between Public Services ▪ Agreement between donor agencies and the Government about funding modalities ▪ Open and clear communication between all involved

Results	**Main indicators**	**Sources of verification**	**Assumptions**
1. An efficient and effective water resources management	▪ In 2010, at least 30% of urban wastewater reused ▪ In 2010, at least 30% of surface water reused	▪ Semi-annual national and municipal reports ▪ Environmental Information System	▪ Collaboration between municipalities, INGRH and municipal/regional MAAP delegations ▪ Availability of funds ▪ Public Services sensitised about rational water use
2. Hygienic conditions for a healthy environment (see also results 8, 9, e 10)	▪ In 2013, 100% of non biodegradable wastes treated ▪ In 2013, 100% of wastewater reused ▪ In 2013, 100% of used oils in main urban centres collected and stored and least 50% treated	▪ Semi-annual monthly reports by the national and municipal basic sanitation departments ▪ Environmental Information System	▪ Public Services sensitised about rational water use ▪ Availability of funds ▪ Public Services sensitised about rational use of resources (stationery, fuel etc.)
3. Marked reduction of infectious and parasitic diseases	▪ Until 2008, a 15% reduction of infectious and parasitic diseases ▪ Until 2008, a 25% reduction of the relative importance of these diseases in mortality figures	▪ Semi-annual progress reports ▪ Health statistics	▪ Public Services sensitised about rational water use ▪ Availability of funds

Results	Main indicators	Sources of verification	Assumptions
4. A biodiversity viable to satisfy a sustainable economic and social development for current and future generations (see also results 5 e 9)	▪ In 2005, regulation prepared for all existing protected areas ▪ From 2004 onwards, fiscal inspection of all import and export of land and marine species ▪ Until 2005, all protected areas (marine and terrestrial) delimited and demarcated ▪ Until 2006, the principal ecosystems catalogues and characterised ▪ Until 2008, management plans for all protected areas prepared and implemented ▪ In 2013, at least 80% of ecosystems with a high biodiversity level recuperated and protected. ▪ In 2013, 100% of the endangered species protected	▪ Semi-annual progress reports by do INIDA, INDP, DGA, DGASP, DGP, Municipalities, NGOs ▪ Ecosystem management plans ▪ Semi-annual implementation reports on ecosystem management ▪ Environmental Information System ▪ Annual reports on changes in environmental qualities ▪ White book on Cape Verde's biodiversity status ▪ Updates of Cape Verde's Red List	▪ Minimal impact of global climatic changes on Cape Verde's climate ▪ No natural disasters ▪ International expertise available
5. A sustainable tourism in conformity with the actual potential of each island	▪ Until 2006, at least 80% of tourist and travel agencies have signed and adhere to the Sustainable Tourism Code of Conduct ▪ From 2006 onwards, construction licences for the tourist industry only emitted or renewed when respective companies have signed the Code of Conduct and present concrete plans for the management and treatment of solid waste and wastewater. ▪ From 2007 onwards , at least 50% of average annual tourism increases through eco-tourism	▪ Licences ▪ Tourism investment plans ▪ Construction plans for tourist development ▪ Urban Development Plans ▪ Municipal annual reports ▪ Sustainable Tourism Code of Conduct with a list of signatories	▪ A continued international development of eco-tourism and responsible tourism ▪ Tourists sensitised about the environmental impact of their actions ▪ Strict law application by local and national authorities
6. A sustainable valorisations of the productive capacity of natural resources	▪ In 2013, and area of 2500 ha, effectively irrigated ▪ In 2013, the area with drip irrigation doubled ▪ In 2013, 20% of the land used for rain-fed agriculture in (sub)humid high altitude zones) converted to more sustainable production system ▪ In 2013, 10% of the land used for rain-fed agriculture in semi-arid zones converted to forestry-grazing systems	▪ Agricultural statistics ▪ Agricultural Census 2004 ▪ Municipal annual reports s ▪ Annual reports of INIDA, DGASP	▪ International and national development of markets for environment-friendly products ▪ International trade barriers (import taxes) removed

Results	Main indicators	Sources of verification	Assumptions
7. A sustainable management and protections of marine resources (sea also results 4 e 13)	▪ Until 2004, the protective period for lobster, sea turtles e molluscs brought up to date and defined ▪ From 2004 onwards, at least 250 fishermen and fish sellers annually trained in methods of fishing grounds protection ▪ Until 2004, fishery legislation, sport fishing regulation. and a national fiscal control plan elaborated ▪ From 2006 onwards a Marine Protect Area management plan elaborated and the fishery resources management plan implemented	▪ Marine resources statistics ▪ Technical reports ▪ Semi-annual reports on the implementation of the National Fisheries Management Plan ▪ Environmental Information System ▪ Cape Verde's State Bulletin	▪ An adequate functioning of international conventions ▪ Foreign vessels adhere to national laws
8. A productive industry with a minimum of environmental pollution	▪ In 2004, indicators for industrial pollution defined and disseminated ▪ In 2004, concrete information on the re-use of industrial wastes disseminated ▪ From 2005 onwards, all industries classified according to environmental impact level ▪ In 2005, legislation on extractive industries and industrial centres defined and elaborated ▪ From 2006 onwards, legislation regulated and fiscal control implemented. ▪ In 2006 policies on production qualities (including environmental indicators for certification)) elaborated and implemented	▪ Technical reports ▪ Technical leaflets ▪ Classification list ▪ Cape Verde's State Bulletin ▪ Environmental Certificates - diploma's ▪ Sectoral information bulletins	▪ Innovative and clean technologies available on the international market which are adaptable to national conditions ▪ Industrial and civil construction companies motivated to invest in clean technologies
9. An efficient and sustainable energy production and utilisation.	▪ From 2005 onwards, an annual increase of at least, 2% of the proportion of renewable energy in the national energy balance ▪ From 2004 onwards, consumers sensitised about the rational use of energy ▪ In 2005, in, at least, 25% (and in 2013 in 100%) of industrial companies and public services, plans for the rational use of energy introduced ▪ Until 2007, the use of firewood and other biomass reduced with 50%	▪ Sectoral plans ▪ Financial reports of the industrial sector ▪ Statistics of bottled gas sales ▪ DGASP Statistics ▪ Municipal reports on uncontrolled tree logging	▪ Public Services sensitised about the rational use of energy ▪ Innovative and clean technologies available on the international market which are adaptable to national conditions ▪ Clean and economically viable technologies available

Results	Main indicators	Sources of verification	Assumptions
10. A dynamic and modern commercial trade, that respects and protects the environment.	▪ Until 2008, controlled import of 90% of packing materials ▪ Until 2005, the ecological tax redefined and adapted ▪ From de 2004 onwards, a strict fiscal control on the use of packing materials, and on the treatment and recycling of solid wastes. ▪ From 2004 onwards, environmental friendly actions promoted and adequate incentives provided ▪ From 2004 onwards environmental labelling and certification promoted (Eco-labels, ISOs)	▪ Reports by the Customs Services ▪ Cape Verde's State Bulletin ▪ Technical reports ▪ Reports by the Chambers of Commerce ▪ Reports by the producer and trade associations ▪ Reports by the consumer associations ▪ Reports by the General Inspection Services of economic activities	▪ Innovative and clean technologies available on the international market which are adaptable to national conditions ▪ Clean and economically viable technologies available
11. Municipalities with a sustainable development and a population actively involved in the responsible exploration and protection of the environment	▪ All indicators mentioned for the other results but desegregated per municipality	▪ Training reports, lists of trainees ▪ Plans and projects prepared by the trainees ▪ Municipal Logical frameworks and work plans ▪ Municipal semi-annual progress reports ▪ Financial reports ▪ Annual reports on changes in environmental qualities	▪ Decentralisation ▪ Adequate collaboration between municipal administration and deconcentrated Public services
12. An educated and informed population actively involved in sustainable development	▪ From 2005 onwards, a 15% annual increase in the population's environmental knowledge level ▪ Until 2006, harmonised environmental education programmes including practical activities, integrated in the curricula of primary, secondary, higher and adult education as well as in adult education ▪ From 2006 onwards, environmental education integrated in the curricula of professional / vocational training institutes ▪ From 2006 onwards, environmental education integrated in community development training programmes	▪ Curricula of primary, secondary, medium and higher education superior ▪ Professional training curricula ▪ Test and examination results ▪ Adult education and training programmes ▪ Newspaper, Radio e Television and other similar media archives ▪ Semi-annual and annual reports by NGOs ▪ Bi-annual National Environmental on changes in environmental qualities	▪ Adoption and formalisation of environmental programmes

Results	Main indicators	Sources of verification	Assumptions
13. An efficient exploration of natural resources (see also results 4, 8, 9, 10)	▪ Until 2007, cadastral information available for the Central Administration and all municipalities ▪ Until 2008, urban management plans available in at least, 50% of the municipalities ▪ From 2007 onwards area/lot allocation for all economic activities defined	▪ National e municipal cadastres ▪ Municipal urban development plans ▪ Municipal development plans ▪ National geodesic network	
14. A modern and adequate legislative package	▪ In 2004, at least, 1 training course for environmental fiscal inspection realised ▪ In 2004, information leaflets for at least 5 environmental laws prepared and distributed ▪ In 2005, all laws revised and harmonised ▪ In 2006, at least, 50% of environmental laws regulated	▪ State Bulletin ▪ Brochures	
		Pre-conditions	
		Until the end of September 2004 ▪ An operational Central Entity ▪ Municipal Technical Teams established and operational ▪ Staff of Municipal Technical Teams and Central Entity trained	

Table 7.2 Tentative PANA II implementation calendar for the period 2004 to 2006

Activity	Responsible	2004				2005				2006			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Operationalisation Central Entity	MAAP - EC, MIT?	X	X										
Ensuring involvement international partners	MAAP- DGCI	X	x	x	x	x	x	x	x	x	x	x	x
Creation of financial management and administration system	MAAP-EC		X	X									
Implementation of environmental monitoring and information system	DGA, INIDA, INGRH etc.		X	X									
Elaboration of planning and implementation manuals	EC/NA	X	X										
Set-up of National Environmental Library	EC - DGA		X										
Establishment of National Council	MAAP- EC		X	X									
Creation of Municipal Technical Teams, Phase 1	Municipalities NA-ANMVC	X	X										
Creation of Municipal Technical Teams Phases 2,3	Municipalities NA-ANMVC			X	X								
Enhanced planning of interventions	Sectors/EC Municipalities/ NA	X			X				X				
Negotiations, collaboration protocols	Sectors/EC Municipalities/ NA	X	X		X	X			X	X			
Implementation	Sectors, Municipalities		X	X	X	X	X	X	X	X	X	X	X
Implementation monitoring		X	X	X	X	X	X	X	X	X	X	X	X
Impact monitoring			X		X		X		X		X		X
1st general revision	EC, Sectors, Municipalities											X	X

Q = Quarter

Obviously, the implementation of PANA II is based on the implementation calendars of the municipal and intersectoral plans and strongly depends on the operationalisation of the Central Entity. Therefore, detailed work plans for the following years can only be elaborated in the second or quarter of 2004.

Taking into consideration that PANA II is a guiding document and is dynamic in nature, periodic revisions of PANA II are foreseen. Future environmental programmes will have to be elaborated in the framework of the analysis presented in PANA II and in close collaboration with those responsible for their implementation (municipalities and civil society).

7.3 Monitoring

Monitoring is an essential element of the implementation and revision PANA II and its subsidiary plans. The system will have 3 elements as shown in Figure 7.1.

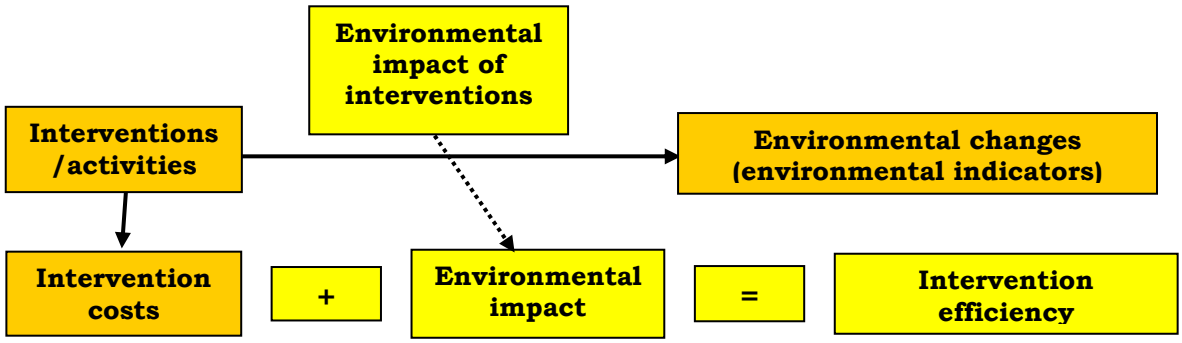

Figure 7.1 Monitoring the implementation of PANA II

1. Progress monitoring of activities, programmes, specific projects, human resources development, stakeholders' involvement, social communication)
   - based on work plans and chronogrammes in PAM and PAIS;
   - with a monthly frequency.

2. Financial Monitoring of expenses per program, and activity
   - based in PAM and PAIS budgets;
   - with a monthly frequency.

3. Environmental Quality Monitoring
   - Based on current environmental values, norms and established thresholds indicated as in PAM and PAIS (Table 7.3);
   - with various frequencies still to be determined.

Table 7.3 Main environmental quality indicators

degree of solid waste pollution	marine and terrestrial biodiversity
water quantities	degree of vegetation cover
water quality/degree of pollution	area of arable lands, cultivated area
degree of soil erosion	forested area
degree of soil fertility	degree of air pollution
degree of soil pollution	degree of environmental qualities for tourist development

In quarterly and semi-annual reports, the three elements of the monitoring system will be linked to identify the effectiveness and the environmental impact of interventions. Partners and beneficiaries will contribute to environmental impact monitoring through a participatory process, including community surveys and the realisation of semi-annual stakeholder meetings.

Co-ordinators of current and planned programmes integrated in the PANA II document, should liase with those responsible at the Directorate General for the Environment to facilitate the monitoring and evaluation of all environmental interventions. Recording sheets that will facilitate the collection of the necessary information will be developed based on the projects sheets mentioned earlier.

7.4 Financing arrangements

PANA II implementation costs estimates are based on the budgets of programmes, sub-programmes and projects indicated in PAM and PAIS and on the recommendations formulated in the thematic base studies (Table 7.4).

Table 7.4 Pluri-annual public investment programme 2004-2014

SUB-PROGRAMMES/PROJECTS	FUNDS REQUIRED (in millions)					
	Total		Guaranteed funding		Solicited funding	
	ECV	USD	ECV	USD	ECV	USD
Sustainable biodiversity management	**48.794,617**	**533,916**	**3.386,858**	**37,059**	**45.407,759**	**496,857**
▪ Development of agro-forestry livestock systems, transformation of agricultural systems	42.748,047	467,754	2.484,551	27,186	40.263,497	440,568
▪ Nature and biodiversity conservation	5.217,636	57,092	698,726	7,646	4.518,910	49,446
▪ Management of environmental vulnerability	828,933	9,070	203,581	2,228	625,352	6,843
Spatial planning	**9.147,503**	**100,093**	**2.202,722**	**24,102**	**6.944,390**	**75,986**
Increase of water availability	**7.598,597**	**83,145**	**1.210,996**	**13,251**	**6.387,601**	**69,894**
Basic sanitation and health	**50.422,480**	**551,729**	**1.584,332**	**17,336**	**48.838,148**	**534,393**
Institutional Development	**8.037,301**	**87,945**	**151,172**	**1,654**	**7.886,098**	**86,291**
▪ Institutional strengthening, cpacity building and legislation	4.810,752	52,640	99,432	1,088	4.711,319	51,552
▪ Environmental education, training and sensitisation	2.671,132	29,228	34,777	0,381	2.636,354	28,847
▪ Monitoring	555,418	6,077	16,962	0,186	538,424	5,891
TOTAL	**124.000,498**	**1.356,828**	**8.536,080**	**93,403**	**115.464,418**	**1.263,425**

From August 2004 onwards, the PANA II budget, in principle, will become an integral part of the General State Budget.

The relative proportions to be made available to the Central Entity, to the sectors at national level and to the municipalities will be defined in the first quarter of 2004. Table 7.5 shows a temporary breakdown, based on the estimated costs for the period 2004-2014.

Table 7.5 Tentative distribution of PANA II funds, based on cost estimates for the period 2004 - 2014

Program		**Percentage**
1	Municipal Environmental Plans	60 %
2	Intersectoral Plans, except the Education Plan	34 %
	Education, training, environmental sensitisation	1 %
3	Institutional development	1 %
	Legislation, environmental inspection	½ %
	Implementation Environmental Quality Monitoring System	½ %
	Implementation of Waste Management Plan	2 %
	Thematic base studies	1 %
Total		100 %

Programmes identified at municipal level will, in principle, be financed through the municipal budgets, also when having a considerable component of national level technical support.

Negotiations between sectors and subsequent collaboration protocols should indicate project co-ordinators as well as those responsible for financial management.

PANA II will be financed through a combination of different financial sources: the General State Budget of financial contributions by various international partners.

To facilitate adequate monitoring and justification of funds received and used, a transparent and concise financial management and administration system is needed. This system should satisfy the demands of the international partners involved and harmonised with the government system.

APPENDIX 1 TRENDS IN ENVIRONMENTAL FUNCTIONS, PER MUNICIPALITY

Environ. resources	Indicators	S. Antão			S. Vin	S. Nic	Sal	BV	Maio	Santiago						Fogo		Brava
		RG	Pa	PN						Pr	SD	SCr	SCa	S M	Ta	Mos	S. F	
Water	Quantity	↓	↓	↓	↓	↓	↑	↑	↓	↑	↓	↑	↑	↑	↑	↑	↑	↑
	Quality	↓	↓	↓	→	↓	→	→	↓	↑	↓	↓	↓	↓	↓	→	→	→
	Avail. for agriculture	↓	↓	↓	↑	↓	↑	↓	↓	↓	↓	↓	↓	↓	↓	↑	↑	↑
	Avail. for livestock	↓	↓	↓	↓	↓	↑	↓	↓	↑	↓	↓	↓	↓	↓	↑	↑	↑
	Avail. for it industry	↓	↓	↓	↓	↓	↑	↓	↓	↑	↓	↓	↓	↓	↓	↑	↑	↑
	Avail. for tourism	↑	↑	↓	↑	↑	↑	↑	↑	↑	↓	↓	↓	↓	↓	↑	↑	↑
	Avail. for domestic use	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
	Ground water levels	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	Surface water levels	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
Bio-diversity	Plant population sizes /densities	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↑	↓
	Area of the vegetation cover	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↑	↓
	Nº of endangered species and species already extinct	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↓	↑
	Forest perimeters	↑	↑	↑	↑	↑	→	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Soil	Area for forestry-pastoral uses	↑	↑	↑	↓	↑	→	↓	↑	→	↑	↓	↑	↑	↑	↓	↓	↑
	Area for dry land agricultural	↓	↓	↓	↓	↑	→	↓	↑	→	↓	↓	↓	↓	↓	↓	↓	↓
	Area for irrigated agricultural	↓	↓	↓	↑	↓	↓	↓	↓	↑	↓	↓	↓	↓	↓	↑	↑	↓
Marine resources	Fish production	↓	↓	↓	↓	↓	↓	↑	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	Fish consumption levels	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
	Coastal zone pollution	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
	Fishery intensity	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
Residues	Production of solid waste	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
	Discharge of used oil in the soil	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
	Waste collection	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
	Accumulation of non biodegradable waste in waste dumps	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑

APPENDIX 2 MUNICIPAL VISIONS

Boa Vista Municipality

A Municipality endowed with a system of sustainable management and exploration of its environmental resources, assuring the involvement of the civil society, of all sectors that use these resources and of those stakeholders that focus on tourism development and contribute to sustainable socio-economic development, preserving cultural values and guaranteeing a good quality of life for its inhabitants.

Praia Municipality

A Municipality that is orderly, clean and green, endowed with an institutional capacity, capable to assure the conservation, use and sustainable management of the Municipality's environmental resources and to contribute to satisfying the basic needs of its inhabitants, with an involved and participating civil society, guaranteeing a satisfactory environmental quality level and facilitating a sustained and durable local development.

Ribeira Grande Municipality

A Municipality developed in social, economic and environmental terms, with a sustainable development dynamism based on social harmony, shared responsibility, and valorization and safeguarding its natural heritage.

Santa Cruz Municipality

A Municipality with a conscientious and responsible population, active in the preservation and rational use of its natural resources contributing to an efficient and sustainable socio-economic development

São Filipe Municipality

A Municipality with a healthy, protected and sustainable environment, with the dynamics of a considerable economic development, based on social harmony and an adequate level of territorial management.

São Vicente Municipality

An efficient and effective management of the island's water resources, with a perfect matching of available resources and necessities, without putting at risk the ecological equilibrium, in the framework of sustainable development.

APPENDIX 3 LINKAGES BETWEEN THEMATIC VISIONS AND OVERALL ENVIRONMENTAL VISION

APPENDIX 4 ENVIRONMENTAL PROBLEMS, THEIR PRIORITY CAUSES AND SOLUTIONS PER MUNICIPALITY

Problems	Causes	S. Antão			Santiago											Fogo		Brava	Solutions	S. Antão			Santiago								Fogo		Brava
		RG	Pa	PN	SV	SN	Sal	BV	Maio	Pr	SD	SCr	SCa	SM	Ta	Ms	SF			RG	Pa	PN	SV	SN	Sal	BV	Maio	Pr	SD	SCr	SCa	SM	Ta	Ms	SF	
Problems in potable water supply	Limited range of distribution network	2	2	2	4	2	3	3	3	2	3	3	3	3	3	2	3	1	Expand distribution network	2	2	1	4	2	4	4	4	3	2	2	2	2	3	2	3	1
	Water loss in the network pipelines	1	1	2	4	2	4	4	4	3	3	2	2	2	3	3	3	2	Substitute distribution pipelines	1	1	2	4	2	4	4	4	3	3	2	2	2	3	3	3	2
	Lack of tank-trucks for water transport in rural areas	1	1	1	4	1	4	4	4	3	2	2	2	2	3	1	1	1	Acquisition of tank-trucks and accessories	1	1	1	4	1	4	4	4	3	2	2	2	2	3	1	1	1
	Insufficient quantities of water explored	2	2	1	4	1	3	3	3	3	2	2	2	2	2	3	3	2	Opening and equipping an increased number of boreholes	2	2	1	4	1	3	3	3	3	2	2	2	2	2	3	3	2
	Irresponsible water use	1	1	1	3	2	3	3	3	3	3	3	3	2	3	2	2	2	Improved water resources management	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni
	Limited mobilisation surface and groundwater	1	1	1	3	1	3	3	3	3	1	1	1	1	2	1	1	1	Construction of dams and household level cisterns Desalinisation of seawater	1	1	1	3	2	3	3	3	3	3	3	3	2	3	2	2	2
	Poor water management by ELEKTRA	0	0	0	3	0	3	0	0	2	0	0	0	0	0	0	0	0	Improved water resources management	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni	ni
Degradation of vegetation cover	Overgrazing	2	2	1	3	1	4	3	3	2	2	1	1	1	ni	1	1	1	Improved livestock management (goats)	2	2	1	3	1	4	3	3	2	2	1	1	1		1	1	1
	Inadequate agricultural practices	1	1	1	3	1	4	4	4	3	1	1	1	1	1	1	1	1	Installation of soil and water conservation infrastructure	2	2	2	2	3	3	3	3	2	2	2	2	2	2	2	2	2
																			Promotion of fruit production	2	2	3	4	2	ni	ni	ni	3	2	2	2	3	4	1	2	1
	Lack of information, training and sensitisation	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Farmer training	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Unauthorised tree cutting	4	4	4	4	3	4	4	4	4	4	3	3	3	4	3	3	3	Farmer training	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
																			Strengthening of environmental inspection, law enforcement	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Uncontrolled extraction of inert materials	Increased constructions	3	3	2	1	3	1	2	3	1	3	3	2	3	2	3	2	3	Strengthening of environmental inspection, law enforcement	3	3	2	1	3	3	2	3	1	3	3	2	3	2	3	2	3
	Lack of employment alternatives / poverty	2	2	1	2	3	4	4	4	2	3	2	3	3	3	3	3	3	Promotion of income generating activities	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Lack of alternative building materials	1	1	3	3	2	3	3	3	1	2	2	2	3	3	3	2	1	introduction of new technologies and material in the construction sector	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Lack of land-use plans	Local administration lacks technical capacity to prepare land use plans	3	3	3	3	1	2	2	4	1	2	1	2	2	2	3	1	1	Strengthening of technical capacities	1	1	1	3	1	1	1	1	2	1	1	1	1	1	1	1	1
	Lack of funding for the preparation of land-use plans	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Strengthening financial resources of local administration	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1
Degradation of aesthetic landscape qualities	Lack of Municipal Development Plans	4	4	4	4	2	1	1	3	1	1	1	1	3	3	1	1	1	Elaboration and implementation of general municipal development plans	1	1	1	1	1	1	1	1	1	2	1	2	1	1	1	2	1
	Insufficient application of urban development plans	2	2	2	4	3	3	3	3	1	3	3	3	3	3	4	3	3	Spatial plans on a regional scale	1	1	1	2	1	1	1	2	1	1	1	1	1	1	2	2	2
	Open air waste dumps	3	3	3	4	4	4	4	4	1	3	3	3	3	3	3	2	3	Construction of waste dumps	3	3	3	4	4	4	4	4	1	3	3	3	3	3	3	2	3
	Disorganised mechanic and carpentry workshops	2	2	2	3	3	3	3	3	1	3	3	3	3	3	3	3	3	Strict application of municipal laws and regulations	2	2	2	3	3	3	3	3	1	3	3	3	3	3	3	3	3

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	Lack of application of municipal regulations	3	3	3	4	3	3	3	3	1	3	3	3	3	3	3	3	3	Strict application of municipal laws and regulations	3	3	3	4	3	3	3	3	1	3	3	3	3	3	3	3	3
Inadequate environmental sanitation	Inadequate collection and treatment of solid wastes	2	2	2	3	3	3	3	3	1	3	3	3	3	3	4	2	2	Acquisition of waste collection trucks	2	2	2	3	3	3	3	3	1	3	3	3	3	3	4	2	2
																			Separate collection and recycling of solid wastes	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Inadequate practices and attitudes among population	3	3	3	3	3	3	3	3	1	3	3	3	3	3	4	4	4	Training, sensitisation	2	2	2	2	2	2	2	2	1	2	2	2	2	2	3	3	3
	Majority of houses does not have sanitary facilities (toilets/bathrooms)	1	1	1	4	2	4	4	3	3	1	1	1	1	2	2	1	1	Promoting the construction of sanitary installations in private housing	1	1	1	4	2	4	4	3	3	1	1	1	1	2	2	1	1
	Sewer network not completed	1	1	1	4	1	2	2	1	1	1	1	1	1	1	1	1	1	Completing the sewer network	1	1	1	4	1	2	2	1	1	1	1	1	1	1	1	1	1
	Lack of waste dumps	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1																		
Scarcity of water for irrigation	Predominance of gravity irrigation systems	1	1	1	3	3	3	3	3	4	4	4	4	4	4	2	2	2	Increased application of micro-irrigation	1	1	1	3	3	3	3	3	4	4	4	4	4	4	2	2	2
	Poor mobilisation and use of surface and groundwater	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Strengthening of financial and technical capacities	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Loss of biodiversity	Capture of endangered	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Creation of income generating activities	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Insufficient environmental inspection. law enforcement	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Strengthening law enforcement /inspection	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	ni
	Inadequate information training and sensitisation	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Information, training and sensitisation of the general public	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

1 = high priority 2 = medium priority; 0 = less important ni = not indicated

RG = Ribeira Grande, Pa = Paúl, PN = Porto Novo; SV = São Vicente, SN = São Nicolau; Pr = Praia, SD = São Domingos, SCr = Santa Cruz, SCa = Santa Catarina, SM = São Miguel, Ta = Tarrafal, Ms = Mosteiros, SF = São Filipe.