

Chapter 5. Operation and Maintenance

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5.1 Current Situation of Operation and Maintenance System

5.1.1 Current Situation

Currently, the waterworks of Santiago Island are managed by SAASs existing in 8 municipalities, except for Praia Municipality.

In Praia Municipality, the ELECTRA and the ADA are responsible for supplying drinking water to the coverage area. The ELECTRA produces desalinated water and mostly targets their service on the water supply for household connections. The ADA, however, is responsible for other types of water supply such as public taps, water trucks, and so on. The ADA purchases the desalinated water from the ELECTRA and distributes it to their customers without producing drinking water by their own.

In other municipalities, SAASs as local water supply entities are responsible for waterworks essentially in their municipal boundaries. SAASs were originally designed as a financially autonomous entity from municipal governments and were established mainly during 1990s. Some SAASs, however, still belong to the mayor's office in municipal governments with a financial subsidy.

The CNAG is a national policy-making body responsible for the holistic water resource management of Santiago Island including water supply. It is a national council consisting of the relevant ministries and institutions; however, there is no organization to manage the waterworks in systematic and holistic ways. The INGRH is responsible for management of groundwater and surface water resources overall, and the MTIE is responsible for the desalination of sea water.

With regard to water tariffs, the ARE is defined as an economic regulator for the water tariff rate: the organization is currently involved in setting the tariff rate only for the waterworks of Praia Municipality managed by the ELECTRA. The water tariff rate in the other coverage area of Praia Municipality is determined by the ADA. In the other 8 municipalities, it is still a local issue decided by each SAAS under the approval of each local municipality and municipal assembly.

Therefore, in Santiago Island, no single organization comprehensively manages and supervises waterworks and the O&M at the whole island level.

5.1.2 Necessity of Establishment of Operation and Maintenance System

The F/S Project is aimed at establishing comprehensive water supply systems according to the governmental orientation which indicates that the desalinated water produced is utilized for the water supply in the whole of Santiago Island. Water supply systems will be established across municipal boundaries, thus, a comprehensive O&M system suitable for the F/S Project plan needs to be established. In the other words, the organization as a water entity should have the capability of managing and supervising waterworks comprehensively, from upstream, namely water production, to downstream as an end-user supplier and water tariff collector.

The recommendations of the O&M systems both in the transition period and in the future are proposed here. In the transition period, the constructed facilities are presumed to be managed by two separate O&M systems in the southern and northern regions. The O&M system in future assumes that the water supply system be integrated into one system after completing the N2 project as an optional case.

5.2 Operation and Maintenance System in the Transition Period

In the transition period, two water supply systems will be established in the south and the north of Santiago Island, respectively. The desalinated water will be produced by the desalination facilities constructed both in the southern and the northern regions, and will be transmitted and distributed to target municipalities.

The O&M system is assumed to separate water production from transmission, distribution and end-user supply. In concrete terms, the production of desalinated water will be consigned to a Specific Purpose Company (SPC) led by the private sector, or to the Aguas de Cabo Verde (ACV) under the supervision of the MTIE.

With regard to transmission, distribution and end-user supply, it is proposed that different O&M systems be utilized by Praia Municipality and by the other municipalities, similar to the current water supply systems as much as possible. In Praia Municipality, the water supply through household connections will be mostly managed by the ACV or by a designated company with a lease contract. And the water supply by other service types will be managed by the ADA, continuously targeting a 100% connection rate. On the other hand, in the other municipalities except for Praia Municipality, SAASs will distribute and supply desalinated water to the customers instead of extracting groundwater after purchasing the desalinated water from concessionaires, which will be responsible for water production.

The details of the O&M system of the southern and northern regions in the transition period is shown as follows:

5.2.1 O&M System in the South

The coverage area of the water supply system of the south region includes three municipalities: Praia, Sao Domingos and Ribeira Grande.

Water production will be continuously undertaken by the ACV, which will be presumably spun-off into a separate entity from the ELECTRA. The new company will take over the concession contract of the ELECTRA, and will operate and maintain a new desalination facility constructed on the site of the ELECTRA¹ in addition to the existing facilities and future extension financed by other donors.

With regard to transmission, distribution and end-user supply, particularly for the current coverage area of the ELECTRA, two options for water supply service could be assumed depending upon the progress of organizational reform of the ELECTRA.

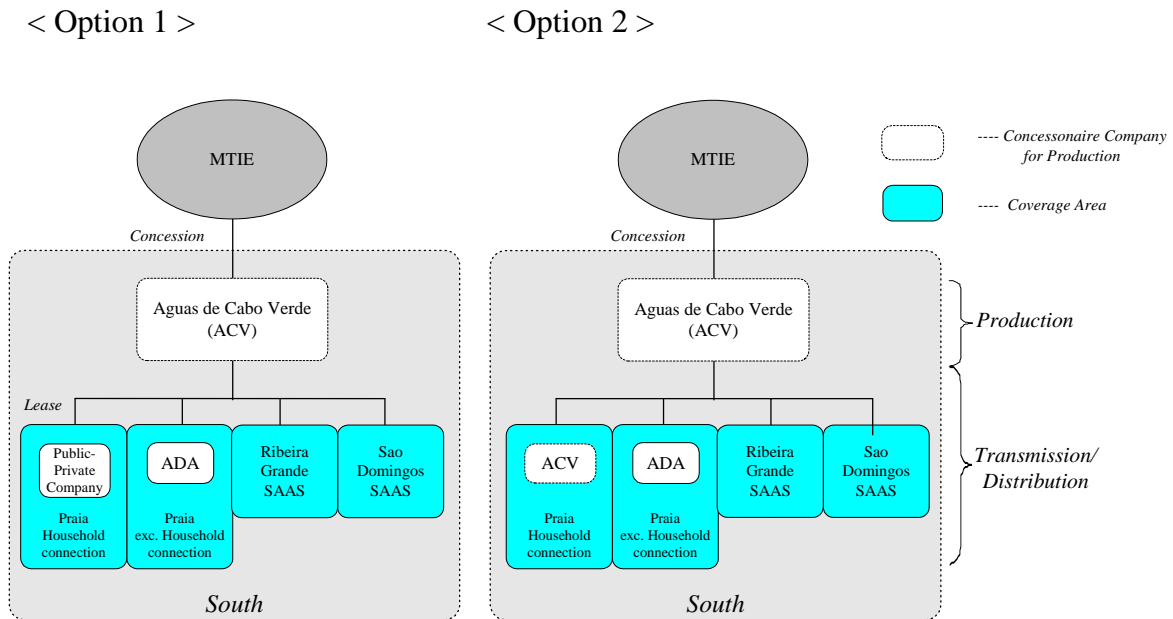
The first option is that O&M of transmission, distribution and end-user supply will be continuously handed over to the ACV, a separate entity from the ELECTRA. The second option is that O&M will be designated to another management entity with a lease contract² with the ACV. Other water supply service types in Praia Municipality, not covered by the ACV, will be continuously taken over to the ADA, the same as the current situation.

Meanwhile, regarding transmission, distribution and end-user supply in Ribeira Grande and Sao Domingos municipalities, SAASs will purchase desalinated water from the ACV.

The conceptual diagram of the O&M system of the southern region in the transition period is shown in Figure 5.2-1.

¹ Reform of the ELECTRA is on-going, supported by the World Bank, and the preliminary idea indicates the separating of the electric power service from the water supply service. The examination of the concession contract could be held, and it is assumed that there is a high possibility that at least the production of desalinated water is taken over by a newly constructed company, the ACV.

² The current concession contract of the ELECTRA with the government of Cape Verde includes all waterworks from water production to transmission, distribution and end-user supply. However, the reform plan indicates 2 options as follows: (1) transmission, distribution and end-user supply will be continuously taken over to the separated company, the ACV, (2) transmission, distribution and end-user supply will be separated from water production, and be consigned to another management entity with a lease contract.



Source: JICA Study Team

Figure 5.2-1: Conceptual diagram of the O&M system in the transition period (Southern Region)

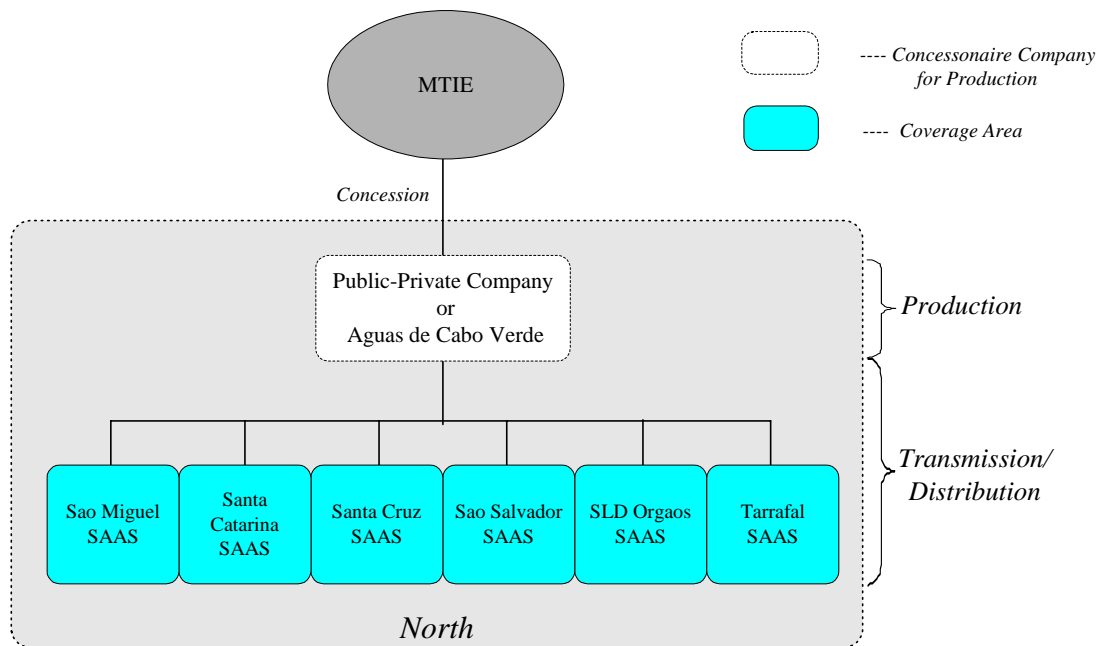
5.2.2 O&M System in the North

The coverage area of a water supply system of the northern region includes 6 municipalities: Santa Cruz, Sao Miguel, Sao Lourenco dos Orgaos, Sao Salvador do Mundo, Santa Catarina and Tarrafal.

Water production will be consigned to a public-private company (SPC led by the private sector) under the concession contract.

With regard to transportation, distribution and end-user supply, SAASs will purchase desalinated water from concessionaires responsible for water production, and will distribute and supply it to customers, instead of extracting groundwater.

The conceptual diagram of the O&M system of the northern region in the transition period is shown in Figure 5.2-2.



Source: JICA Study Team

Figure 5.2-2: Conceptual diagram of the O&M system in the transition period (Northern Region)

In the northern region, the idea of a separation between upstream and downstream³ comes from the result of consideration of the following points: (1) O&M of the desalination facility is a new area for most SAASs, which have been engaged with waterworks regarding groundwater resources, (2) some people from SAASs are anxious regarding the O&M of an inexperienced desalination facility, (3) Santa Cruz owns a desalination facility; however, their experience is limited, less than two years, and the facility's scale is much smaller than the one which will be installed by the F/S Project⁴.

The Government of Cape Verde, meanwhile, promotes public-private partnerships (PPP) from a viewpoint of efficiency by the decree-law No.36 and the MEGC's order No.47, which indicate that the responsibility for O&M of the desalination facility will be given to SPC, led by the private sector. Therefore, it could be considered as a realistic way to consign the production of desalinated water with a concession contract to SPC, which will be established between the Government of Cape Verde and a private company with experience of such O&M.

³ Upstream means desalinated water production and downstream includes transmission, distribution and end-user supply.

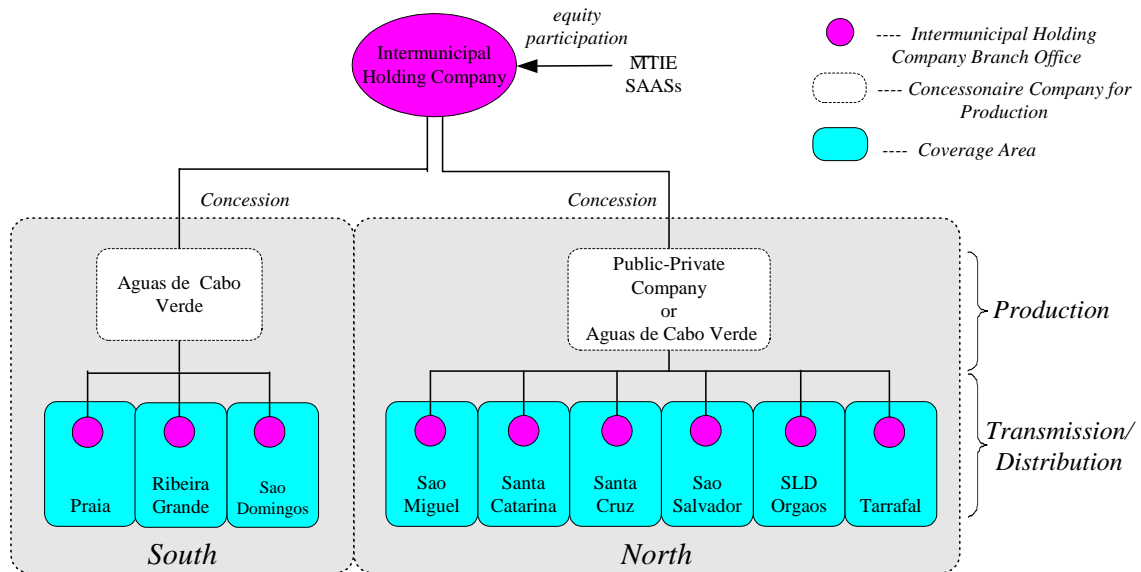
⁴ Santa Cruz SAAS has a desalination plant with a production capacity of 500 m³/day, and the SAAS staff has been charged with the O&M of the plant since May 2008.

5.3 Operation and Maintenance System in the Future

5.3.1 Establishment of Inter-municipal Public Holding Company

As a future scenario, it is proposed to establish an inter-municipal public holding company shared by each SAAS and the MTIE; the company will manage and supervise the water supply system comprehensively in southern and northern regions. Current SAAS will be integrated into the branch office of the inter-municipal public holding company; the branch office mainly consisted of the former SAAS staff who will be responsible for the distribution and end-user supply within the municipal coverage area. Meanwhile, similar to the transition period, it is assumed that water production will be consigned to a public-private company (SPC led by private sectors) in the northern region and the ACV in the southern region with a concession contract.

The conceptual diagram of the O&M system in the future, and summary table indicating a relationship between ownership and O&M entities, are shown in Figure 5.3-1 and Table 5.3-1, respectively.



Source: JICA Study Team

Figure 5.3-1: Conceptual diagram of the O&M system in the future

Table 5.3-1: Property ownership and O&M entity

<i>Region</i>	<i>Ownership/ Role</i>	<i>Production</i>	<i>Transmission</i>	<i>Distribution</i>
North	Property ownership	Public-Private Company (SPC)	State	Municipality
	O&M	Public-Private Company (SPC)	Inter-municipal Public Holding Company	Inter-municipal Public Holding Company
South	Property ownership	Aguas de Cabo Verde	State	Municipality
	O&M	Aguas de Cabo Verde	Inter-municipal Public Holding Company	Inter-municipal Public Holding Company

Source: JICA Study Team

The waterworks management by an inter-municipal public holding company would be designed taking into consideration the successful model of the Aguabrava Public Company in the Fogo and Brava islands in Cape Verde (Box 5.3-1). At the beginning stage of the Project, it is envisaged that waterworks will be managed by an inter-municipal public company until getting on the right track, then it is expected that the company will implement a privatization policy step by step in the future⁵.

5.3.2 Reasons for Establishment of Inter-municipal Public Holding Company

It is recommended that one inter-municipal public holding company acts as a super-agency to comprehensively manage and supervise the waterworks in Santiago Island due to the following reasons:

- (1) GoCV plans to integrate the water supply system both in the south and north regions into one system in the future in order to supplement water demand with mutual water supply through the looped pipeline. If multiple organizations manage a part of one water supply system separately, management could be inefficient and it could be difficult to quickly respond to problems. Therefore, the most desirable and appropriate O&M system should be managed by one company in future.
- (2) The production of desalinated water will be consigned to one or several concessionaire companies, and the super-agency organization has the responsibility for supervising and

⁵ The Aguabrava public holding company might be privatized in June 2010, 10 years after its establishment.

monitoring of water quantity and quality. Particularly, drinking water is a crucial resource for people-related infrastructure. If serious changes in quantity and quality can be seen, frequent reporting, communication and coordination among stakeholders, such as the relevant municipalities, concessionaire companies and an inter-municipal public holding company, need to be undertaken otherwise the influence on water users might become significant. The negotiation with the relevant municipalities could be not an easy way in the case that they face the shortage of the desalinated water due to any troubles.

- (3) The financial balance of the waterworks in Praia Municipality could show better performance because of the relatively flat geological condition, the high population density, with about 40% of the total population in Santiago Island, the large number of customers, and the high percentage of household connections by pipeline. Meanwhile, the average household income and current water tariff rate in Praia Municipality are higher than other municipalities. This means that there is the potential that the profitability of waterworks in the southern region might be higher than that of the northern region.
- (4) In contrast, the financial balance in the northern region could be lower than that in the southern region due to the low population density with a wide scattering of customers, the geological conditions, namely a large difference in altitude, and the long length of the pipeline. As a result, there is the worry that a higher water tariff rate will be imposed on the people in the north who have a relatively low household income and lower ability to pay. A contradictory phenomenon is likely to happen.
- (5) Therefore, it is important to set up an appropriate water tariff rate corresponding to the affordability to pay in each municipality, and to securely establish a cross-subsidy system which compensates for the lack of profit within the overall financial balance of all the waterworks. On the other hand, it is desirable and necessary that one company manages a comprehensive waterworks without dividing the waterworks between the southern and northern regions, and without separating the waterworks in Praia Municipality into all the waterworks in Santiago Island.

5.3.3 Recommendations

A significant difference of the O&M system between the transition period and the future is the issue of distribution and end-user supply service in Praia Municipality. With regard to distribution and end-user supply service, this study suggests the following recommendations:

- (1) A branch office of the inter-municipal public holding company will be established in Praia Municipality similar to other municipalities, and the branch office will manage

the distribution and end-user water supply in Praia Municipality as a whole.

- (2) The branch office in Praia Municipality will comprehensively manage the distribution and end-user supply service without separating the water supply service by household connections from other water supply services. The Praia branch office of an inter-municipal public holding company is presumed to consist of the main staff from the consigned company responsible for the water supply for household connections and from the ADA responsible for the water supply by other means, such as public taps and water trucks.

In terms of the recommendation (1), it will be a key factor for sustainable waterworks to integrate waterworks both in the south, which have high profitability, and the north, which have low profitability, into one waterworks, including the waterworks in Praia Municipality which is expected to be the most profitable, and to comprehensively manage one waterworks by cross-subsidizing profits between the waterworks in nine municipal areas. If the water supply service by household connections in Praia Municipality is separated from all the waterworks managed by an inter-municipal public holding company, there may be a considerable impact on the profitability of an inter-municipal public holding company.

As for the recommendation (2), the ELECTRA has managed the water supply mainly for household connections, probably with a high profitability, since 1999. On the other hand, the ADA has separately managed the water supply service by other means, mainly public taps and water trucks with low profitability⁶. The ADA has suffered financially due to low profits from the water supply service by other means. Thus, an appropriate solution is to integrally manage both types of water supply service from the viewpoint of efficiency, profitability, and management. Since the F/S Project assumes the percentage of people's access to water will reach approximately 100% in 2020, most of the water will be supplied through a pipeline connection.

Therefore, there is no necessity to divide the waterworks between the water supply for household connections and for other types within the Praia Municipality. The efficient

⁶ The water supply in Praia Municipality had been historically implemented by the municipal government. Since 1999, the ELECTRA started to manage the water supply mostly for household connections, considered to be highly profitability, with a concession contract. Therefore, the ADA took over water supply services for other means, such as by public taps and by water truck. The ADA requests the provision of financial subsidies from Praia Municipality because they could receive only 70% of the normal amount of desalinated water and suffered from a severe financial deficit, due to an intake pump problem of the ELECTRA that happened in February 2010. The improvement of the financial situation and reliable service and improved quality will be expected if the existing human resources can be utilized efficiently.

management of waterworks will be also expected through the integration of these two water supply types.

Box 5.3-1 Case Study of the Aguabrava Public Company

The Aguabrava Company is an inter-municipal water company of Fogo and Brava islands established by Resolution No.1/2000 of the Assembly of the Association of Municipalities in Fogo and Brava islands. Technical and financial assistance were extended by the German government in the establishment period, and Luxembourg currently provides technical cooperation to the company.

After the integration of water supply systems in the relevant municipalities of Fogo Island, an attempt at the comprehensive management of waterworks was started. The director delegate was publicly recruited from a private company, the Royal Dutch Shell company in Praia city in Santiago Island. The Aguabrava, as a public company, has improved its performance, step by step, regarding financial balance, non-revenue water ratio, collection efficiency and the number of customers during 2000-2010. In addition, the company avoided drastically reducing the number of staff in accordance with a social security policy of the municipal governments. The company plans to be privatized in 2010, ten years after its establishment.

The Aguabrava Company can act as a good model for comprehensive waterworks management beyond municipal borders.

The main features are described as below:

Shareholders:	4 municipalities (Fogo Island: Sao Filipe, Mosteiro, Santa Catarina, Brava Island: Brava)
Office:	Headquarters in Fogo Island, branch offices in each municipality
No. of employees:	140 staff, gradually reduced from 290 staff in 2000 The staff was transferred from the former Autonomous Water Service (SAAS) of Fogo and Brava islands, when the company was established.
Non-Revenue Water (%):	Average 34%, gradually reduced from 55% in 2005
No. of customers:	7,284 clients, increased from 4,008 in 2005
Collection efficiency (%):	98%, increased from 81% in 2005

Source: JICA Study Team based on Interview Survey

5.4 Operation and Maintenance System for the Water Supply Facilities Constructed by F/S Project

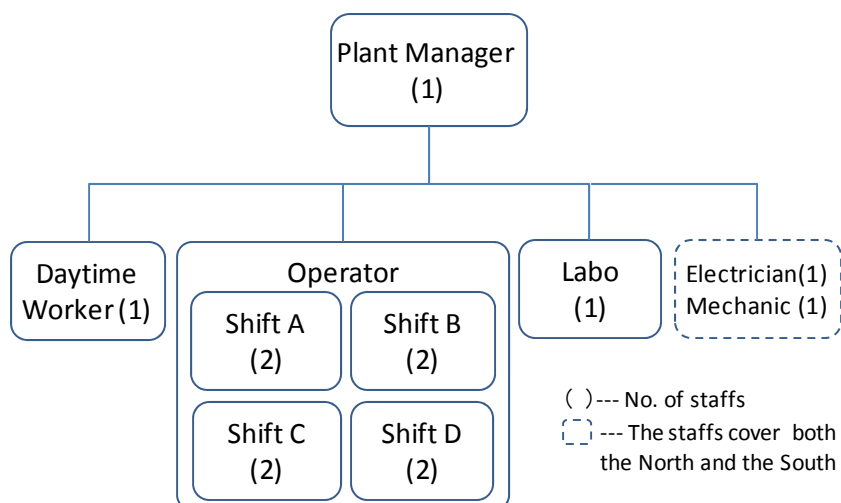
Water supply facilities newly constructed by the F/S Project are desalination facilities, including intake facilities, transmission facilities, including transmission pipeline and pumps, and reserve facilities such as reservoirs both in the north and south regions. The number of necessary staff for O&M is shown in the following table:

Table 5.4-1: Personnel Composition for O&M of Project Facilities

Project	SWRO Plant		Transmission
	Plant manager/ Operator	Electrician/ Mechanic	
S1	11	2	15
S2	0		2
N1	11		15
N2	0		2
Total	22	2	34

Source: JICA Study Team

The personnel composition for desalination facilities applicable for both the north and the south regions is shown in the following figure:



Source: JICA Study Team

Figure 5.4-1: Personnel Composition for O&M of the Desalination Plant

Both in the case of the northern project (N1, N2) and the southern project (S1, S2), the water supply facilities newly constructed by the F/S Project will be operated and maintained by the following staff, respectively: 11 staff for desalination facilities, 17 staff for transmission and reserve facilities, 1 electrician and 1 mechanic both for the north and for the south regions.

The desalination facilities, with 20,000 m³ per day production capacity both in the northern system and the southern system, will each be operated and maintained by 8 operators. The O&M will have three shifts per day with 4 teams. One team consists of two persons. In daytime, a plant manager and a daily worker will be stationed for managing the operation together with the operators. The main work for operators is basically to operate the RO system and to check the operation conditions in addition to the appropriate operation of intake facilities and pre-treatment facilities. The operational data, such as the turbidity of raw water resources, the water production quantity by the RO membrane, the differential pressure of the RO membrane and the concentration of filtered water should be checked and recorded in the recording sheet every hour. The cleaning and replacement of the RO membrane will be conducted as necessary.

The main work for the mechanic and electrician will be daily maintenance management. They will participate in cleaning and replacement work similar to the operators' work. Both the mechanic and electrician will cover the desalination facilities both in the northern and the southern systems, because both systems will be integrated into one system in the near future.

As for water quality management, new 2 staff for water quality laboratories will be necessary. Currently, the ELECTRA located in the southern region has a water quality laboratory in the desalination facility in their factory; therefore the testing system for water quality will be assumed to also be integrated into one system responding to the integration of the water supply system in future.

The main work for transmission and reserve facilities is the operation and management of transmission pumps, chemical injections into reservoirs and the maintenance of these facilities. The number of transmission pumps will be 7 in the northern project and 6 in the southern project. The number of new reservoirs to be constructed will be 6 for the northern project and 5 for the southern project. The O&M for reservoirs will be implemented by 17 staff, both in the northern and southern projects.

Chapter 6. Initial Environmental Examination (IEE)

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6.1 Objectives of the IEE

The Initial Environmental Examination (IEE) of the water Supply System Development Project in the Republic of Cape Verde took place from October 2009 to July 2010. The IEE was carried out in accordance with the JBIC Guidelines for Confirmation of Environmental and Social Considerations (hereinafter referred to as “the JBIC Guidelines”) dated April 2002 and relevant law of the GoCV. The IEE includes the findings, recommendations and conclusions based on the JICA Survey. The objectives of the IEE are:

- 1) To identify the items of negative impact on environmental and social conditions through the Project implementation,
- 2) To suggest mitigation measures to be expected and
- 3) To prepare the recommendations for Environmental Impact Assessment (EIA) that will be conducted by the GoCV after the JICA Survey, including additional work, work schedule and staff required by the GoCV based on the Guidelines.

6.2 Environmental Policy of the JBIC Guidelines

Screening

JICA classifies the project into one of the following four (4) categories before environmental review. The subsequent environmental review will then be conducted in accordance with the required procedures of its category. During the screening process, JICA will classify the project in terms of its potential environmental impact, taking into account certain factors: 1) the sector and scale of the project, 2) the substance, 3) degree and uncertainty of its potential environmental impact and 4) the environmental and social context of the project site.

Category A:

Projects likely to have a significant impact on the environment and projects with complicated impacts or unprecedented impacts that are difficult to assess are classified as Category A. Projects in sensitive sectors, with sensitive characteristics and projects located in or near sensitive areas are also classified as Category A.

EIA Reports, which borrowers and relevant agencies are responsible for preparing, shall be required for Category A projects. If large-scale involuntary resettlement will not be avoidable due to the projects, Resettlement Action Plans (RAP) also must be submitted to JICA. JICA will proceed with its environmental review based on the EIA Reports (and RAP, if necessary).

Category B:

For projects with more limited impact on the environment, which is site-specific, few if any are irreversible and attenuated by introducing normal mitigation measures and are classified as Category B.

The environmental reviews for Category B are similar to that of category A, including evaluation of negative and positive impact, counter-measures for negative impact and measures to promote positive impact, but submission of EIA Report is not a mandatory requirement. JICA will proceed with its environmental review based on the relevant laws of the borrowers' side, and if an EIA procedure has been conducted, JICA may refer to it.

Category C:

Projects likely to have a minimal or no adverse environmental impact are classified as Category C. For projects in this category, an environmental review will not proceed beyond screening.

Category FI:

Projects composed of some sub-projects are classified as Category FI, those sub-projects will be selected after JICA's approval of funding (or assessment of the project), cannot be specified prior to approval and have a potential impact on the environment. JICA will monitor the project implementation whether appropriate environmental and social considerations are undertaken based on the JBIC Guidelines.

Considering the interventions relating to the Project, there will be no requirement to resettle families. Neither will natural habitats, historic, archaeological or cultural assets be affected. Furthermore, the Project will have no influence on protected areas. The Project can therefore be classified as Category B in accordance with the above criteria.

6.3 Environmental Management in Cape Verde

6.3.1 Policies and Development Plans

National Action Plan for the Environment (PANA-II)

Objectives

Under Law No. 86/IV/93 that defines the basic policy regarding the environment, the Executive Secretary for the Environment (SEPA) was created in 1995 and is responsible for the definition of environmental policy. In 1994, SEPA established the First Action Plan, *National Action Plan for the Environment 1994-2004* (PANA-I).

In late 2001, the second National Action Plan for the Environment (PANA-II), a document

that will provide the framework for guiding interventions in the environment for a period of 10 years, was started being prepared. PANA-II was included in the guidelines for development for the “Summit on Sustainable Development” held in Johannesburg in September 2002. The objectives of PANA-II are to provide strategy and guidelines for rational utilization of natural resources and sustainable management of economic growth that aims:

- 1) To set the policy guidelines for natural resources management,
- 2) To identify environmental and development priorities,
- 3) To identify interventions to facilitate effective and efficient use of natural resources,
- 4) To define the institutional structures and mechanisms necessary for inter-sector coordination,
- 5) To promote the integration of environmental plans regarding socio-economic development and
- 6) To improve the living condition of the people.

Inter-sector Environmental Plans (PAIS)

Under PANA-II, to achieve the above objectives and to tackle the above environmental problems that traverse some sectors, the following nine (9) Inter-sector Environmental Plans (PAIS) were prepared in order to create a sense of harmony between the environment and the following nine (9) sectors and avoid duplication and the risk of omitting strategic options:

- 1) Sustainable Management of Water Resources
- 2) Public Health
- 3) Biodiversity
- 4) Spatial Planning
- 5) Education, Training, Information and Awareness
- 6) Tourism
- 7) Agriculture, Forestry and Livestock:
- 8) Fisheries
- 9) Industry, Energy and Commerce

Regarding 1) and 3) concerning the proposed Project, the National Program is prepared based

on the following points:

Sustainable Management of Water Resources:

- A big priority is to mobilize resources and to construct infrastructure allowing the population access to water for good health and hygiene and the reduction of water loss in agriculture. The protection of water resources against pollution is also a priority.

Biodiversity:

- The priority of this sector is to improve knowledge about marine and terrestrial biodiversity in all its aspects, including recovery and conservation of biodiversity.
- The management of biodiversity is closely related to the management of water resources, the modernization of agriculture, forestry and animal husbandry, promoting income-generating activities and the consequent reduction of poor agricultural practices, uncontrolled exploitation of natural resources and aggregate extraction.
- Relation to marine biodiversity priorities focuses on improving knowledge about the species in general, with emphasis on endangered species and endemic and rational management of side areas.

Logical Framework

Based on the PAIS, the Logical Framework is set to identify the strategic guidelines, effect indicators, target years, etc.

Regarding the Project, the following indicators and target years are set in the Logical Framework corresponding to the strategic guidelines for management of water resources and biodiversity:

Efficient and Effective Management of Water Resources:

- In 2010, at least 30% of waste water from urban centers is reused
- In 2010, at least 30% of surface water is used

Biodiversity in meeting the needs of Economic and Social Development:

- In 2005, all existing protected areas are regulated
- Until 2005, all protected areas (terrestrial and sea) are delimited and demarcated

- Until 2006, the main ecosystems are inventoried and characterized
- By 2008, management plans for all protected areas are developed and implemented
- In 2013 at least 80% of ecosystems with a high concentration of biodiversity are retrieved and protected.
- In 2013, 100% of the species endangered are protected

6.3.2 Institutional Framework for Environmental Management

Direction of Industry and Energy, Ministry of Tourism Industry and Energy (MTIE)

The Direction of Industry and Energy is in charge of the proposed water supply project and is responsible for conducting the EIA study, including the mobilization of the budget for EIA, management of tender for selection of EIA consultants, preparation of the EIA Report and monitoring of the project from the point of view of environmental aspects.

Ministry of Environment, Rural Development and Maritime Resources (MADRRM)

The centre is responsible for the promotion of rules and regulations that preserve the environment, i.e., forest use and soil conservation practices.

Direction General of Environment (DGA)

Under Law No. 86/IV/93 that defines the basic policy regarding the Environment, the Executive Secretary for the Environment (SEPA) that was created in 1995 is responsible for the definition of environmental policy. In 2002, SEPA was abolished and the Direction General of Environment (DGA) was created under the MADRRM.

Regarding the proposed water supply project, the DGA is in charge of the EIA Authority as the office which is responsible for the environment.

The mandate of EIA Authority under EIA procedures is as follows:

- 1) To receive, coordinate and administrate the EIA procedures
- 2) To appoint the Evaluation Committee
- 3) To charge the project owner a fee to defray the costs of EIA
- 4) To give advice on the application for exemption of EIA
- 5) To propose decisions to EIA and notify the authority concerned
- 6) To promote public participation
- 7) To prepare the report of public participation

- 8) To ensure the answers to the participants
- 9) To publish documents relating to the EIA procedure
- 10) To control the results of post-evaluation
- 11) For skills recognition, organize and update the registration of technicians responsible for EIA
- 12) To organize, to up-date and ensure public access to the register of the EIA, final opinions and decisions of the EIA and decisions under the procedures of licensing or authorization of EIA projects, as well as monitoring reports and audits conducted under EIA procedures
- 13) To examine, in collaboration with other authorities, compliance with the legal discipline of the EIA, as well as examining incompatible cases
- 14) To propose or impose fines, as delegated by the members of government responsible for the environment

Camara Municipal

Camara Municipal is the local authority that manages environmental affairs and it establishes the Environmental Commissions under the procedures of EIA. Appointed persons belonging to the department in charge of environmental affairs shall cooperate and promote public participation and participate in the Evaluation Committee of EIA. Each municipality establishes a Municipality Development plan (PDM) including a Municipality Environmental plan in order to harmonize development projects and the environmental affairs at the municipal level.

6.3.3 Legal Framework for Environmental Management

Law No. 86/IV/93

This law is the basic law regarding environmental policy in Cape Verde, especially concerning prevention of deterioration of environmental quality, and provides the objectives and required content of EIA with respect to new projects. The EIA must include:

- 1) Analysis of the local environment study
- 2) Study of modifications resulting from the implementation of the project
- 3) A full inventory of foreseeable impacts, and measures to suppress, reduce and compensate the possible impacts on the natural environment

Decree-Law No. 29/2006

This decree provides the framework of EIA for development projects. Annex-I of the

Decree-Law No.29/2006 defines the projects and sectors which required EIA.

Project/Sector required EIA

A proposed water supply project shall be required to conduct the EIA Study based on the following articles of Annex-I of *Decree-Law No.29/2006*:

18 Collection, treatment and distribution of water - CAE - CV - Section E - Division 41

- a) Work on canalization and regulation of water routes
- b) Installation of facilities for reservoirs and storage of water
- c) Collection, treatment and distribution of desalinated and non-desalinated water

20 Construction - CAE - CV - Section F - Division 45

- d) Construction of base camp

(1) Environmental Impact Assessment (EIA) in Cape Verde

The procedures for EIA and the necessary items to be studied are provided in *Decree-Law No.29/2006*. MTIE is responsible for conducting EIA, and EIA is necessary for MTIE to proceed with the project. The Direction General of Environment (DGA) is responsible for approving the EIA Report in relation to the MTIE and it takes four (4) months to approve the EIA Report by the GoCV.

According to the decree, EIA is required to formulate the water supply project; the detailed procedures of EIA described in *Decree-Law No.29/2006* are as follows:

Objectives

Fundamental objectives of EIA are:

- 1) To help decision making to ensure environmental sustainability
- 2) To prevent and to correct the negative environmental impacts produced by the project
- 3) To promote the positive impacts produced by the project
- 4) To make more efficient, faster and less expensive the adoption of measures designated to avoid or to minimize significant environmental impacts, to reduce or to compensate for

the negative environmental impacts and to maximize the positive impacts due to the project

- 5) To guarantee the participation of the public in the decision making process

Entitled Authorities

The following 'actors' intervene through the EIA procedure:

- 1) Licensing entity/Responsible for authorization
- 2) EIA Authority
- 3) Municipal Environmental Commissions
- 4) Evaluation Committee

Regarding proposed water supply project, the INGRH is in charge of the Licensing entity/Responsible for authorization and the DGA as EIA Authority.

Municipal Environmental Commissions have been established in Camara Municipal, including appointed persons belonging to the department in charge of environmental affairs at the municipal level, to cooperate and promote public participation and participate in the Evaluation Committee.

The Evaluation Committee consists of a representative of the EIA Authority as the chairman, at least two technical experts are appointed by the EIA Authority within or outside their departments to ensure the interdisciplinary nature of the committee, and representatives of the Environment Committee of the municipalities affected by the project.

(2) EIA Procedure

Necessary information to start the EIA

Based on Annex-I of the *Decree-Law No.29/2006*, regarding the proposed water supply project, the following information in respect of each construction item shall be required to start the EIA procedure:

Table 6.3-1: Necessary information to start the EIA

Project/Sector required EIA (Annex-I, Decree-Law No.29/2006)	Construction Item	Necessary information
a) Canalization works and regulation of water routes	<ul style="list-style-type: none"> • Transmission Pipe Line • Distribution Pipe Line 	<ul style="list-style-type: none"> • Candidate Pipe Line Route • Diameter of Pipes (ϕ mm) • General description of construction method
b) Installation of facilities for reservoir and storage of water	<ul style="list-style-type: none"> • Reservoir 	<ul style="list-style-type: none"> • Candidate Construction Site (Reservoir, Access Road, etc.) • Surface Area (m²) • Plan, Elevation and Section of Buildings • Number and Specification of Equipment Capacity (m³)
c) Collection, treatment and distribution of desalinated and non-desalinated water	<ul style="list-style-type: none"> • Desalination Plant 	<ul style="list-style-type: none"> • Candidate Construction Site (Plant, Access Road, Intake point, Discharge point, etc.) • Surface Area (m²) • Plan, Elevation and Section of Buildings • Number and Specification of Equipment • Production Capacity (m³/day) • Energy Consumption (kw)
	<ul style="list-style-type: none"> • Pumping Station 	<ul style="list-style-type: none"> • Candidate Construction Site (Station, Access Road, etc.) • Surface Area (m²) • Plan, Elevation and Section of Buildings • Number and Specification of Equipment • Capacity (m³/day) • Energy Consumption (kw)
d) Construction of base camp	<ul style="list-style-type: none"> • Base camp 	<ul style="list-style-type: none"> • Candidate Construction Site • Surface Area (m²)

Source: Study team

Necessary Contents for EIA Report

EIA study is necessary for approval of the Project by the GoCV and the following table indicates a sample of the necessary contents for EIA Report based on the environmental law of *Decree No.14/97, 1st July*.

Table 6.3-2: Contents of EIA Report

— Sample —
1. Objectives of the Development
2. Description of the Project
3. Project Affected Area
4. Environmental Characterization of the Project Affected Area
4.1. Physical Aspects
4.1.1. Geology
4.1.2. Hydrology
4.1.3. Climatology
4.2. Socio-Economic Aspects
4.2.1. Socio-Economic Characteristics
4.2.3. Scale of Population Directly or Indirectly Affected by the Project
4.3. Ecological and Biological Aspects
4.4. Cultural Aspects
5. Environmental Impact Assessment
5.1. Exploration Phase
5.2. Construction Phase
5.3. Operation Phase
5.4. Impact on Landscape
5.5. Impact on Public Health
6. Mitigation Measures
7. Action Plan to be performed

Source: Study team

Submission

EIA procedure begins after submission of the EIA Report from the project owner to the Licensing Authority/those Responsible for authorization. EIA and other required documentation are forwarded by the Licensing Authority/those Responsible for authorization to the EIA Authority within **5 business days**. The EIA Authority gives instructions regarding the process

relative to EIA to the project owner within **15 business days** (maximum) and appoints the Evaluation Committee which will make the Technical Evaluation of EIA.

Technical Evaluation

The Evaluation Committee will conduct a Technical Evaluation and will deliver relevant comments regarding conformity with the previous objectives within **20 business days** starting from its inception.

Public Announcement and Participation

After confirmation of conformity through the Technical Evaluation, the EIA Report will be sent to the EIA Authority within **15 business days** and a Public Announcement will be made. The Public Announcement to municipal and public entities will be made within **10 business days**.

Any citizen who might be affected by the project and other public and private entities are entitled to participate in the EIA procedure. The opinions can be sent through mail, fax, e-mail or handed personally to the EIA headquarters. The EIA Authority shall answer and provide explanations to the opinions stated.

Final opinion on EIA

Once the Public Participation has closed, the Evaluation Committee elaborates on its final opinion based on the Technical Evaluation and report of the result of the Public Participation within **10 business days**. The final opinion must contain all measures to be taken in order to prevent, to mitigate or to cancel any negative impacts on the environment.

EIA Approval

The member of the government responsible for the environment shall issue a decision on the EIA proposed by EIA authority within **15 business days** from the date of its inception.

When the nature of the project has been justified, the Government official responsible for the environment may forward the EIA for approval by a council of ministers for the environment within **20 business days** from its inception. EIA Authority shall announce the Licensing Authority/those Responsible for authorization and the project owner about the result of the approval plan.

Validity of EIA

Approval of EIA would be invalidated if the project could not be executed within **2 years** after public notification.

Public notification

EIA Authority will hold a public notification within a period of **15 days**. The notification includes the following items:

- 1) Decision of remission of EIA procedure
- 2) EIA Report
- 3) Summary of EIA without technical contents
- 4) Final opinion on EIA
- 5) EIA Approval
- 6) Decision regarding the Licensing Authority/those Responsible for authorization
- 7) Monitoring Reports
- 8) Audit Reports

Monitoring

The post-evaluation shall be made to establish a system for monitoring during construction, operation, exploration and deactivation, and all projects subject to EIA must be prepared for the monitoring process.

Monitoring should be done under the jurisdiction of the project owner according to the conditions of EIA approval and Monitoring Reports should be submitted periodically to EIA Authority.

(3) Expropriation (Land Acquisition)

The expropriation procedure is provided in *Decree-Law No.3/2007*. Regarding the proposed water supply project, the MTIE is responsible for expropriation. People and their properties affected by the project identified by MTIE shall be compensated by the Ministry of Finance.

The detailed procedure described in *Decree-Law No.3/2007* is as follows:

Objective and Principle of the Law

This law regulates the expropriation of irreplaceable property and rights, including the ownership of the public and private entities expropriated and transferred for the purpose of public use, in order to ensure fair compensation in principle of:

- 1) The acquisition of property subject to expropriation for public use can only be effected by the advance payment of fair compensation under this law.
- 2) As for the case of urgent expropriation or the case in which the entity would benefit from expropriation are excluded under the terms established by this law.
- 3) In the situation referred to in above 2), as for the case of urgent expropriation, at the time of the declaration of public land use or within 30 days from the date of this statement, the administration and proprietor shall engage in a corresponding amount and guarantee respectively under this law accompanied by the penalty for the expiry of the expropriation.
- 4) The period referring to the preceding can be extended up to 90 days by a court if the proprietor of the expropriation claims it.

(4) Procedure of Expropriation

Declaration of Public Land Use

The expropriation for public land use shall be declared to the minister responsible for planning, by the competence of the government for expropriation or by the request of an entity (project owner) interested in the expropriation.

Necessary Information

The following documents shall be required, either for the case of a declaration undertaken by the Government or for the case by another entity, for the information for public land use:

- 1) Site Plan of the location of property to be purchased with graphic scaled map
- 2) Information allowing for judging the motive and opportunity of the expropriation
- 3) Implementation programs of expropriation with a timetable
- 4) Certification including description of the buildings on the land, issued by the land registry, including registered rights
- 5) Certification of inventory matrix

- 6) List of the owners, tenants, lessees, or holders of other rights who have relations with the assets to be purchased
- 7) Evidence, in compliance with this law, certifying no expropriation process started before judging
- 8) Copies of the public announcement
- 9) Evidence certifying balance of the budget for expropriation
- 10) Evidence certifying indispensable background for the payment, secured by any of the forms permitted in law, for the compensation that would take place

Opposition to expropriation

Under this law, anyone can oppose the illegal and inappropriate expropriation by addressing the minister responsible for planning, if the case satisfies the following conditions:

- 1) The opposition must be reasonable
- 2) Administrative decision may be appealed under this law

Procedure of Compensation

- 1) Classification of land:

For purposes of calculating compensation for expropriation, the lands are classified into urban areas (for residential purposes) or rural areas.

- 2) Calculation of the value of urban land:

The value of the land in an urban area or building lot is calculated considering the location, the value of construction or therein in accordance with the laws and regulations in a normal economic recovery. The environmental quality shall also be taken into account.

In a normal economic recovery, respecting the laws and regulations, the value of land shall correspond to 20% of the construction on it.

If the cost of construction is substantially augmented or diminished by special local conditions, the amount of the value of the land shall be regulated considering the value of the buildings.

- 3) Calculation of the value of rural land:

The value of the land in a rural area is calculated to taking into account the effective yield or

the nature of the land, including configuration of the terrain, conditions of access, predominant crops, fruit and other circumstances of influence in their calculation.

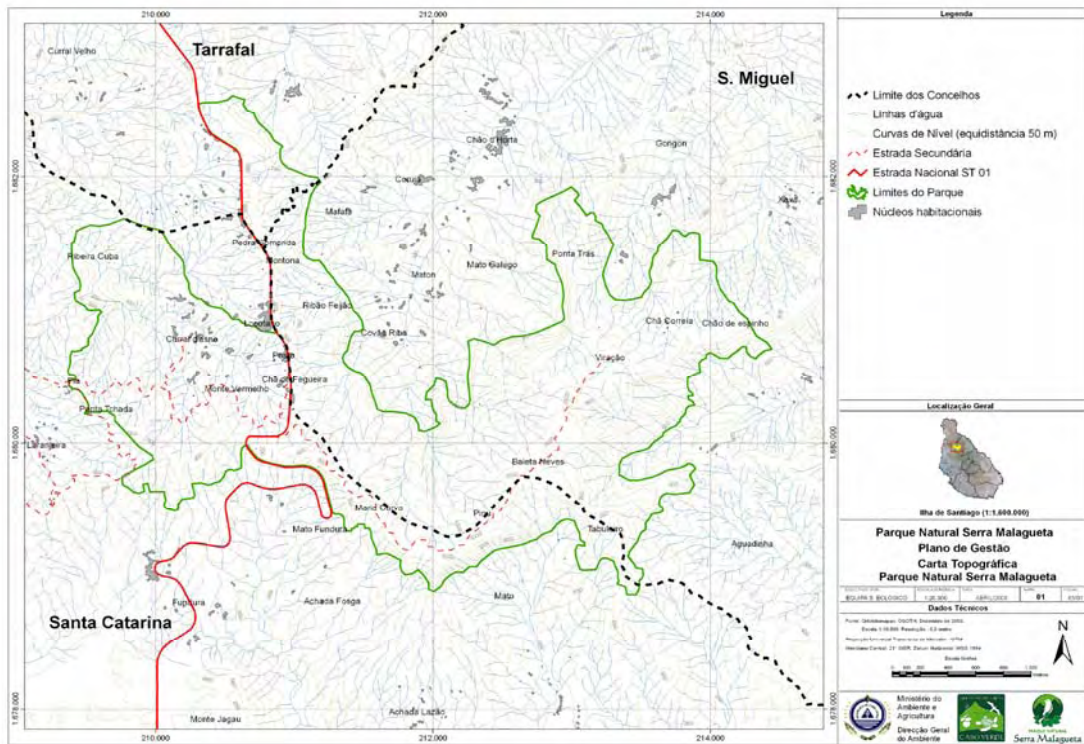
4) Determination of the value of buildings or constructions:

The value of buildings or constructions licensed in accordance with the laws and regulations shall be determined considering following elements:

- a) Situation and surrounding environment. Particularly in terms of urban space, condition of infrastructure, public transport and proximity of equipment
- b) Architectural quality and comfort of existing buildings and conservation status, including floors, roofs, external walls, common shares, doors and windows, etc.
- c) Area covered
- d) Price of previous acquisitions and dates
- e) Asset value for tax purposes
- f) Number of tenants and rent
- g) Value of property of nearly the same quality
- h) Statements made by taxpayers or assessments for tax purposes for obtaining credit, provision of collateral or other purposes
- i) Rating from viewpoint of architectural interest such as landscape and culture

(5) Protected Areas

In Santiago Island, *Serra Malagueta*, the mountain area in the north is registered as a national protected area based on *Decree-law No.3/2003* and “*Serra Malagueta Natural Park Management Plan*”, approved in *Resolution No.40/2008*, which provides a protection area classified into zones based on its characteristics. In the park, possible activities are determined according to the regulations of each zone.



Source: “Serra Malagueta Natural Park Management Plan” Ministry of Environment and Agriculture, Direction General of Environment

Figure 6.3-1: Boundary of Serra Malagueta Natural Park

Characteristics of Zones

The Serra Malagueta Natural Park is classified into zones according to two criteria: i) Basic Areas and ii) Specific Areas, based on the general purpose and specific uses, respectively.

i) Basic Areas

Basic Areas are classified into three zones according to general purpose:

1) Zone for Moderate Use (ZUM):

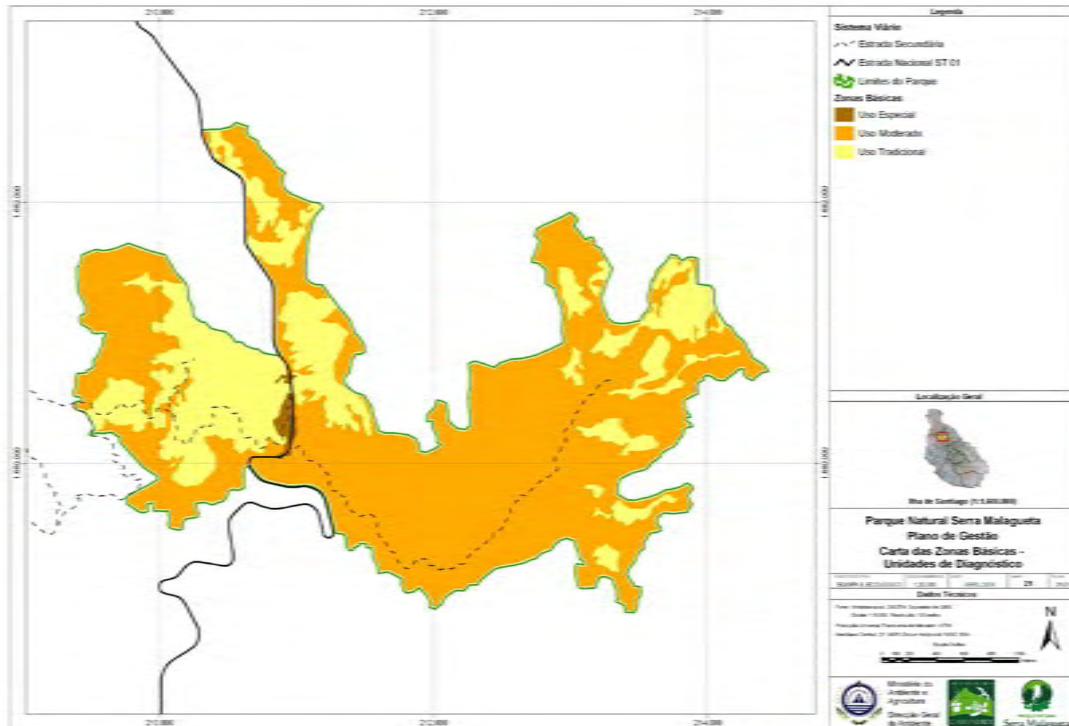
This zone is a general conservation area of resources compatible with free movement and recreation of people, collection of traditional seeds, fruits and other plant products, unless they affect the endemic flora.

2) Zone for Traditional Use (ZUT):

This zone allows for the traditional practice of sustainable use of natural resources, which can be regulated by itself.

3) Zone for Specific Use (ZUE):

This zone shall be controlled based on the guidelines for villages, infrastructure and management of the area and visitors.



Source: "Serra Malagueta Natural Park Management Plan" Ministry of Environment and Agriculture, Direction General of Environment

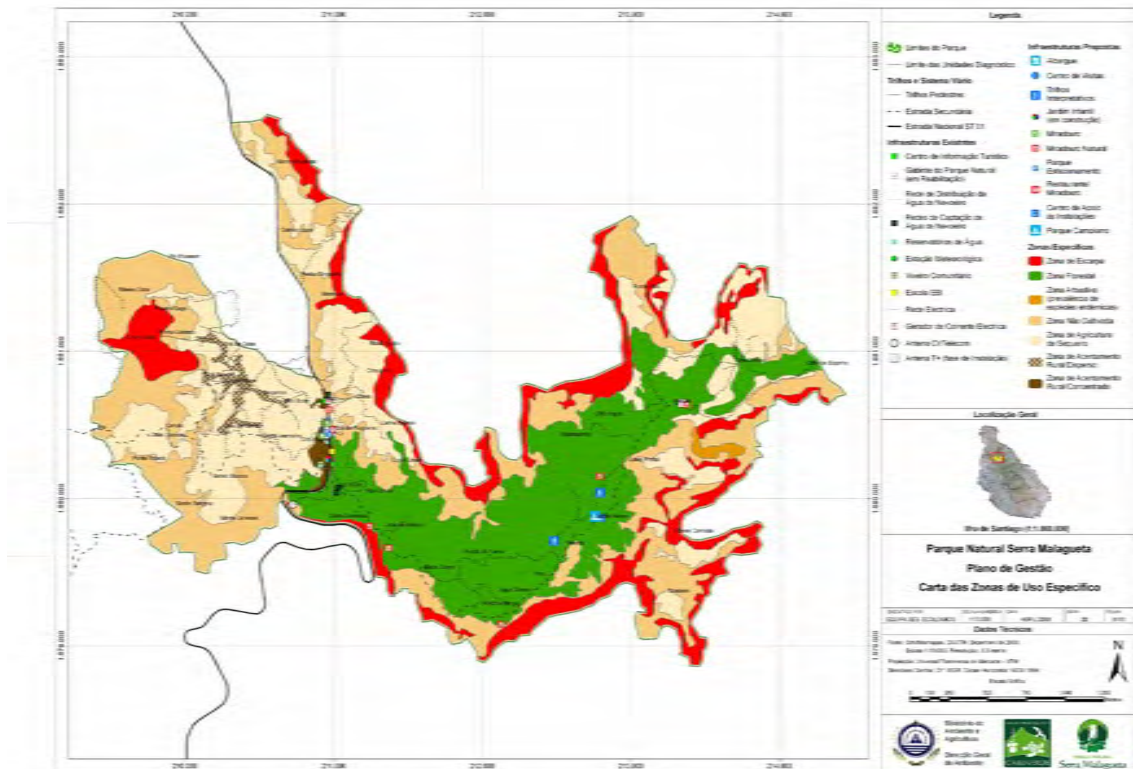
Figure 6.3-2: Basic Areas

ii) Specific Areas

The plan also provides seven (7) Specific Areas as described below:

- 1) Slope Zone (Z.1):
Corresponds to escarpments, lakes and river areas.
- 2) Forest Zone (Z.2):
Corresponds to forest areas.
- 3) Endemic Species Zone (Z.3):
Corresponds to the area for endemic species.
- 4) Uncultivated Zone (Z.4):
- 5) Rainfed Agriculture Zone (Z.5):
Corresponds to the dry land agricultural areas.

- 6) Dispersed Rural Settlement Zone (Z.6):
- 7) Concentrated Rural Settlement Zone (Z.7):



Source: “Serra Malagueta Natural Park Management Plan” Ministry of Environment and Agriculture, Direction General of Environment

Figure 6.3-3: Specific Areas

General Regulation

The general regulation of the Plan includes the following uses/activities regarding the water supply project as the target to be managed. The general regulations for each use in relation to the Specific Areas are listed in the following Table:

- 1) Infrastructure (Water supply pipe):

It includes the facilities of the network of water supply and waste water.

- 2) Technical Services:

It includes the facilities and spaces reserved for the technical services of electricity (electric generator), a pumping system for underground water, reservoir, plant, etc. It also includes the facilities related to energy savings by reducing, reusing and recycling waste liquids and solids.

Table 6.3-3: General Regulations in Specific Areas

Uses / Activities	Z.1	Z.2	Z.3	Z.4	Z.5	Z.6	Z.7
Driving in forest area	CL	CL	CL	CL	CL	CL	CL
Replacement of forest and vegetation area	NP	CL	CL	CL	CL	CL	NP
Collection of biological material for conservation and breeding	C*	C*	C*	C*	C*	C*	C*
Hunting	CL	CL	CL	CL	CL	NP	NP
Educational equipment	NP	NC	NC	NC	NC	C	C
Health-care equipment	NP	NC	NC	NC	NC	C	C
Socio-cultural equipment	NP	NC	NC	NC	NC	C	C
Recreation equipment - sports	NP	NC	NC	NC	NC	NC	C
Office equipment	NP	NC	NC	NC	NC	C	C
Eco-tourism equipment	NP	NC	NC	NC	NC	C	C
Scientific equipment	CL*	CL*	CL*	CL*	CL*	C*	C*
Infrastructure (Road)	NP	CL	CL	CL	CL	C	C
Infrastructure (Telecommunication)	NP	CL*	NC	CL*	CL*	C*	C*
Infrastructure (Water supply pipe)	NP	CL	NP	CL	CL	C	C
Technical Services (Electric Generator, Reservoir, Recycling facilities)	NP	CL*	NC	CL*	CL*	C*	C*
Indications and signs of the services of the Park	NP	CL	NP	CL	CL	CL	CL

C: Compatible

Those uses and activities are allowed without any limitation or authorization, as compatible with the values and characteristics of the park.

C*: Compatible with permission

Those uses and activities are required to obtain authorization of the Institution of the Park.

CL: Compatible with constraints

Those uses and activities are permitted in a particular area through complying with the limitations or criteria established by these rules of the Plan or with the restrictions set by the existing legislation.

CL*: Compatible with limitation and permission

Those uses and activities declared as compatible with the limitations established by these rules and they shall be required to obtain the authorization of the Institution of the Park.

NC: Not Compatible

Those uses and activities are incompatible with the objectives of the Plan and they shall be avoided within the Park.

NP: Not Provided

Those uses and activities are not allowed.

Source: "Serra Malagueta Natural Park Management Plan" Ministry of Environment and Agriculture, Direction General of Environment

(6) Endangered Species in Coastal and Marine Areas

No coastal and marine areas are classified as protected areas. On the other hand, certain coastal areas, e.g., south beach of Tarrafal, identified as the place where green turtles lay eggs and local beach areas shall be protected as potential tourist resources.

Regarding endangered species that might be affected by construction near coastal areas, the following birds, mainly in coastal areas, are classified as endangered (disappearing) endemic species.

Table 6.3-4: List of Endangered Birds in Santiago Island

Scientific name	Common name	Family	Conservation status*1	Description of habitat*2
Milvus fasciicauda Hartert		Accipitridae	CR	
Ardea bournei L.	Garça-vermelha	Ardeidae	CR	
Milvus migrans	Milhafre	Accipitridae	DD	Bird found in cliffs and villages
Falco madens	Soutador	Falconidae	EN	Marine bird found in coastal areas
Phaethon aethereus	(Rabo-Junco) Red-billed Tropicbird	Phaethontidae	EN	Marine bird found in coastal areas
Calonectris edwardsii	Cagarra	Procellariidae	EN	Marine bird
Acrocephalus brevipennis	Tchota-de-cana	Sylviidae	EN	Cosmopolitan bird, makes its nests in trees
Pandion haliaetus	Guincho	Pandionidae	R	Bird found in coastal areas
Pterodroma feae	Gon-gon	Procellariidae	VU	Marine bird found in mountain and coastal areas
Sula leucogaster	Alcatraz	Sulidae	VU	The most popular marine bird in Cape Verde

*1: Conservation status is classified according to the IUCN Red List category
EX: Extinct, CR: Critically Endangered, EN: Endangered, VU: Vulnerable, LR/cd: Lower Risk/Conservation Dependent, NT or LR/nt: Near Threatened, DD: Data Deficient, LC or LR/lc: Least Concern

*2: Ecological conditions of habitat should be described (coastal areas, mountainous dry areas, desert areas, wet valleys, etc.)

Source: Bird Life International and INIDA -1993 Red list for birds

(7) Integral Tourism Development Zone (ZDTI)

Based on Article 5 of *Decree-Law No.2/93, 1st February*, a key objective of national tourism policy, the Integral Tourism Development Zone (ZDTI) has been established in order to enable the country to benefit economically from reserving the land necessary to achieve high-quality

tourism projects.

In Santiago Island, several areas shall be reserved as ZDTI, especially for tourist zones considering the great potential of its landscape and natural environment. Thus, the proposed new desalination plants, pumping stations and reservoirs in the project shall be constructed out of ZDTI.

The following areas are classified as ZDTI in Santiago Island:

- 1) North of Praia, Municipality of Praia
- 2) Santiago Golf Resort, Municipality of Praia
- 3) Achada Baleia, Municipality of São Domingos
- 4) Porto Coqueiro, Municipality of Santa Cruz
- 5) Achada Laje, Municipality of Santa Cruz
- 6) Mangue Monte Negro, Municipality of Santa Cruz
- 7) Achada Rincão, Municipality of Santa Catarina
- 8) Alto Mira, Municipality of Tarrafal



Source: Study team

Figure 6.3-4: ZDTI in the Santiago Island

(8) Decrees

National Legislation

In 1993, after the UN Conference in Rio-1992 on Environment and Sustainable Development, Cape Verde adopted its first environmental legal instrument that defines the basis of its environmental policies as fundamental law. Today, the legal system in Cape Verde integrates a set of legal provisions that regulate various environmental concerns in the country, including nature conservation, air, water, soil, noise, etc.

The relevant decrees regarding environmental management are summarized as follows:

- Law No.86/IV/93, 26th July: It provided the basis for Environmental Policies.
- Legislative Decree No.14/97, 1st July: It developed the basis of the above Environmental Policies.
- Decree-Law No.29/2006: It established the legal framework of the environmental impact assessment for public or private projects.
- Decree-Law No.3/2003, 24th February: It established the legality of the Natural Park.
- Decree No.31/2003, 1st September: It regulated municipal and other industrial solid waste in order to protect the environment and human health.
- Decree-Law No.22/98, 25th May: It regulated minimum standards for construction works during night considering noise and safety conditions.
- Law no.44/VI/2004: It defined the delimitation of the property of the public maritime domain. Coastal areas, including beaches, coves and bays within 80m from a contiguous line of maximum high tide, belongs to the public. The use and occupation of property in the public maritime domain can be granted to the extent that they are compatible with the demands of public use.

6.4 Description of the Project

In Praia city and Calheta (Municipality of São Miguel), the project will include both new desalination plants and the installation of transmission facilities from the desalination plants to existing reservoirs. The projects in Tarrafal, São Salvador do Mundo, São Domingos, Ribeira Grande Santiago and São Lourenço Orgaos will mainly expand the transmission pipes from new desalination plants to existing reservoirs in each municipality and increasing the capacity of reservoirs. The project components in each municipality are summarized in the following figure:

CABO VERDE - Water Supply System of Santiago Island



Altitude levels are indicative
Pumps location and reservoirs locations are indicative

Source: Study team






Figure 6.4-1: Project Summary






6.5 General Description of Environmental Situation along Routes

Under the concept of the proposed water supply project, the main transmission pipe line routes will be constructed along existing roads. A general description regarding the environmental situation and considerations along the routes are summarized as follows:

Route: Praia – Ribeira Grande				
	2km before Cidade Velha	10km from Cidade Velha		
	Achada Forte New Reservoir (1,000m ³)	Historic Area of Cidade Velha		
<p>General Description of Environmental Situation: Most of the road is paved with stone. Few villages are situated along the route but buildings are not close to the road. A new reservoir (1,000m³) to supply water to Cidade Velha is under construction at Achada Forte, 10km from the center of the city. No significant influence is identified due to the project. The city of Cidade Velha (Ribeira Grande) was made a UNESCO World Heritage site in 2009, the first one in Cape Verde.</p>				

Route: Palmarejo Desalination Plant – São Domingos				
	Replacement of Pipe Line	2km from Desalination Plant		
	10km from Desalination Plant	3km before Center of São Domingos		
<p>General Description of Environmental Situation: A new road was constructed from Palmarejo to São Domingos in 2007. The proposed pipe line route to the municipalities in the north of the island will be developed along this road in order to avoid traversing through Praia city center. No villages are situated along the route. No significant influence has been identified due to the project. The pipe line from the existing desalination plant to the reservoir of the city of Praia is now being replaced.</p>				

Route: São Domingos – Assomada			
	 <p>Near the city of São Lorenzo</p>	 <p>Near the city of Picos</p>	
	 <p>City center of Picos</p>	 <p>Entry to the city of Assomada</p>	
	<p>General Description of Environmental Situation: The entire road is paved with asphalt. Few villages are situated along the route and some buildings are close to the road. No involuntary resettlement will occur under the current situation. Any temporary discomfort during construction shall be mitigated, including the provision of home access to local people and easily accessible roads for traffic.</p>		

Route: São Domingos – Sanata Cruz			
	 <p>5km from São Domingos</p>	 <p>Poirao Dam</p>	
	 <p>Palmier</p>	 <p>City center of Pedra Badejo</p>	
	<p>General Description of Environmental Situation: The road is paved with asphalt from São Domingos to 2km before the city of Pedra Badejo. Few villages are situated along the route but buildings are not close to the road. No significant influence is identified due to the project.</p>		