Anexo 1-5

Minutes of Meeting (4th Steering Committee)

&

Discussion materials

MOM
OF
PROJECT STREERING COMMITTEE
ON
FEASIBILITY STUDY
FOR
ENHANCED WATER SUPPLY SYSTEM PROJECT

DATE: August 27th, 2010
PLACE: Praia, Cape Verde

1. The Government of the Republic of Cape Verde (GoCV), in cooperation with the Government of Japan, intends to develop a structuring and strategic water sector project on the island of Santiago, aiming both at improving the water supply conditions, through the interconnection of water transmission and distribution networks, and at strengthening the production capacities;
2. Given the specific and strategic significance of the project, a diligent and efficient technical follow-up will be needed for the same;
3. In the scope of implementation of the above mentioned project, there will be a need to guarantee, to the GoCV, reliable technical counsel and assistance;
4. It is much advisable that the project be followed up and supported by all sectors and institutions which are, in one or other way, related to the water sector.
5. In this purpose, a Project Steering Committee has been officially established on 26th of January 2010 by the DISPATCH No. 007 / 2010 issued by MEGC (now MTIE).
6. The Project Steering Committee has met officially for the fourth time on the 23rd of August 2010, in the office of Cape Verde Stock Exchange (Bolsa-de Valores), Praia, Cape Verde. The list of participants is given in ANNEX-2.
7. During the Project Steering Committee, the JICA study team made a presentation regarding the Interim Report of the study as referred in ANNEX-1.
8. The Project Steering Committee members hereby confirmed full understanding of the Interim Report with main points discussed as per hereto the Attachment of the Minutes of Meeting.

By Chairman of the Project Steering Committee

Mr. Pedro Alcantara Silva
MTIE / General Directorate of Energy

MINUTES of MEETING
on
THE INTERIM REPORT
for
THE PREPARATORY SURVEY
on
WATER SUPPLY SYSTEM DEVELOPMENT PROJECT
in
THE REPUBLIC OF CAPE VERDE

Praia, 27th August, 2010

Mr. Pedro Alcantara Silva
Directorate General for Energy,
Ministry of Tourism, Industry and Energy
The Government of the Republic of Cape Verde

Mr. Mitsutoshi SUZUKI
Lead Consultant of the Survey Team
Japan International Cooperation Agency

Attachment

Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched a mission (hereinafter referred to as "the JICA Mission") to the Republic of Cape Verde. Since their arrival on August 19th, 2010, the JICA Mission and officials of Government of the Republic of Cape Verde (hereinafter referred to as "the GoCV"), Ministry of Tourism, Industry and Energy, (hereinafter referred to as "MTIE") had detailed discussions on the Interim Report of the Preparatory Survey (hereinafter referred to as "the Survey") for Water Supply System Development Project (hereinafter referred to as "the Project").

In the course of discussions, both sides confirmed the main items described below. The JICA Study Team will proceed as planned up to December 2010, when the Survey comes to the end.

1. Conditions of the Survey in general
   The JICA Mission stated that the results of discussions do not imply any decision or commitment by JICA for its prospective loan for the Project at this moment and the above results should be reported to the higher authority of JICA and the Government of Japan.

2. Reports submitted
   The JICA Mission handed the following reports to MTIE during their staying in Praia
   1) 7 hard copies of Interim Report
   2) 1 hard copy and electrical data of Water Analysis Report
   3) 1 electrical data of Geotechnical Survey Report

3. Major Points Discussed

(1) JICA Mission made a presentation regarding the Interim Report of the study using ANNEX-1 to all attendants listed in ANNEX-2.

(2) After the presentation, all attendants made discussion, question and comment as below:

a. RO core system

2 staged RO system is adopted in order to clear less than 0.5mg/liter of the Boron content in drinking water without ground water utilization as dilute.

CAPEX and OPEX of 2 staged RO system are about 5-10% higher than those of 1 staged RO system accordingly.

In future, when above Boron content become less than 2.4mg/liter, 2nd stage RO may be deleted.

b. Ground water utilization

No ground water will be utilized for drinking water after the system completion, due to the GoCV policy, the small CAPEX and OPEX reduction effect, and Boron removal technology using 2 staged RO system.

c. Transmission line material

Ductile Iron cement lining pipe (DICL) and High Density Polyethylene (HDPE) were proposed. Those materials are well known for water service, and are expected to be high corrosion resistance. The some existing transmission lines in Praia are producing red water due to corrosion during the long service period, and must be repaired or replaced.

d. Implementation Schedule

The proposed schedule is a JICA typical schedule.

Cape Verde side strongly expressed to shorten the schedule, since the water supply issue must be critical.

e. Water analysis

JICA Mission introduced the water analysis result conducted by Inpharma, Cape Verde.

JICA Mission commented that the fresh sea water around the candidate desalination facility construction site has no issue for the facility design.

JICA Mission also commented that some results of ground water analysis should be further investigated on Nitrate, Coliform and Total Hardness in particular. Those data were higher than allowable on the sampling date.

It was proposed that ground water of PT33 well in Santa Cruz should be analyzed, since the well is for potable water. JICA mission commented that purpose of this analysis is to determine the possibility of mixing ground water to RO product water, and ground water is already concluded not to be used, in this situation, further analysis is recommended to be discussed separately.

f. Power supply

JICA Mission commented that power supply might be a medium grade risk for the reliable operation of the water supply system.

The captive power for the system is likely installed for the OPEX reduction and the reliable operation, however the power supply system in Santiago island will be improved shortly.

As a result, the water supply system will have neither the captive power generation system nor the emergency power generation system.

g. Existing 500m^3/day SWRO in Santa Cruz

The OPEX including power, fuel and chemicals is very high for Santa Cruz municipality.

Chemicals are high cost and difficult for purchasing in particular.

h. Boron content in drinking water

Boron content in drinking water was newly declared to be less than 1.0mg/liter on July 2010 by the Ministry of Health, the GoCV.

The JICA Mission insisted that keeping Boron content less than 0.5mg/liter was the expected performance and was required proper operation and maintenance of the desalination facility.

JICA Mission will not modify the technical specification regarding Boron in the Interim Report.

i. Water production by sea water desalination or ground water

Each municipality has each financial and geotechnical properties.

Municipalities, who can draw ground water easily with low cost, would like to continue utilizing ground water as potable.

j. Japan's ODA Loan

JICA Mission explained to conduct the preliminary economics study based on the general loan condition such as 1.4% p.a. interest, because STEP is not yet concluded to be applied.

JICA Mission expressed that this project could be applied to STEP loan, in case the requirements for STEP loan application will be satisfied.

k. Economics Study

JICA Mission commented their preliminary economic study on

1) the total system (huge CAPEX required) on the Santiago island
2) the separated and phased systems of south and north regions on the island,

then the project for Praia area (S1 Project) shows the best economics.

For further detail discussion among related parties, JICA Mission agreed to prepare,

1) Desalinated water production facility cost, and product water transmission facility cost
2) Initial investment cost, and operation & maintenance cost,
3) Rough Profit & Loss calculation in each municipality referring to real tariff.

l. O&M Planning

JICA Mission proposed the phased operation and maintenance planning.

The operation and maintenance planning will be further discussed by JICA Mission and the GoCV.

m. IEE and EIA

JICA Study Team conducted IEE, and no critical issue was found.

The GoCV will conduct EIA based on the Interim Report.

(End)

ANNEX-1: Fourth Steering Committee Presentation
ANNEX-2: Attendants List of the Second Steering Committee

4th. Steering Committee
on
Water Supply System
Development Project in Santiago, Cape Verde

August 23, 2010 at Praia

Japan International Cooperation Agency

Toyo Engineering Corporation
UNICO International Corporation
Ingérosec Corporation

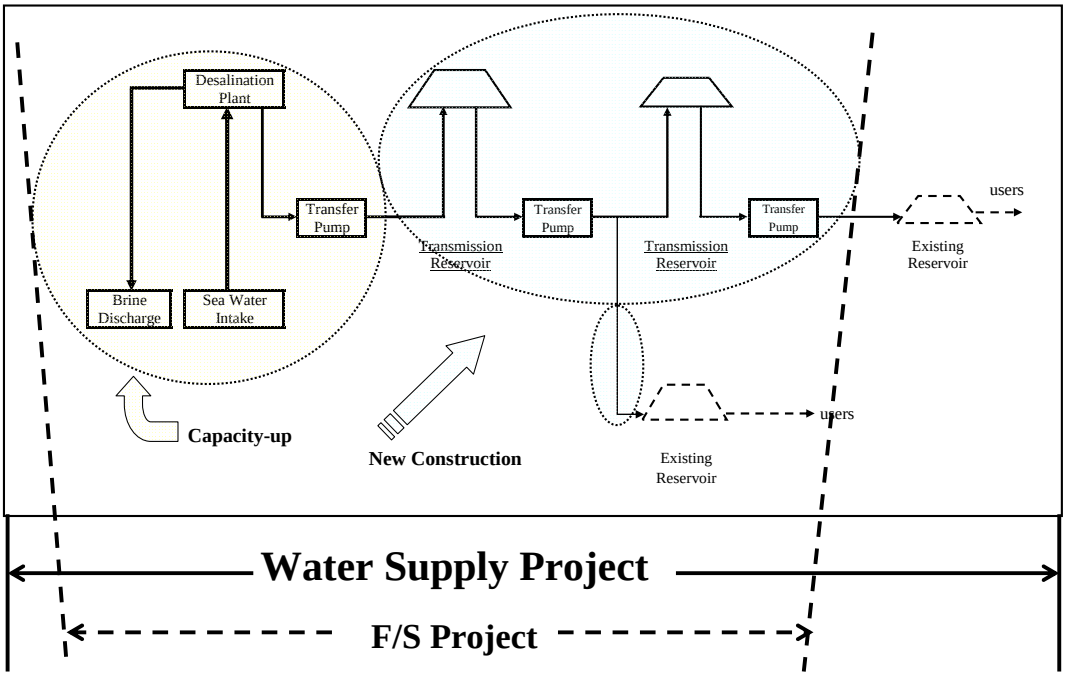
1. Introduction
2. Water Analysis and Geotechnical Survey
3. Basic Plan Development
4. Project Feasibility Study
5. Operation and Maintenance
6. Initial Environmental Examination
7. Conclusion and Way Forward

1-1 Implementation Schedule of JICA Study

		2009			2010										2011					
Year / Month		Phase 1						Phase 2												
		10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6
Field Work		1st			2nd				3rd			4th			5th							
Submission of JICA Report		IC/R					PR/R				IT/R			DF/R		F/R						
Steering Committee						☆			☆	☆		☆			☆							
Local Consultant			Socio Economica Analysis						water analysis geological survey													
Phase 1	To analyze the project conditions																					
	To set the project scope, sites and components																					
Phase 2	To define Water Supply System as FS subject																					
	To conduct Conceptual Design with CAPEX/OPEX																					
	To conduct IEE																					
	To develop Financing Plan and conduct Economical Analysis																					

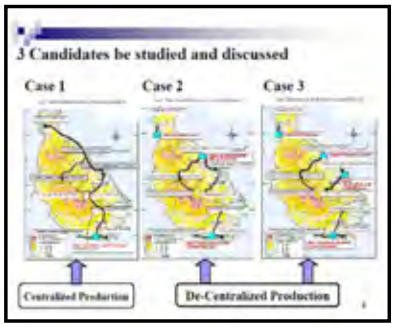
We are here.

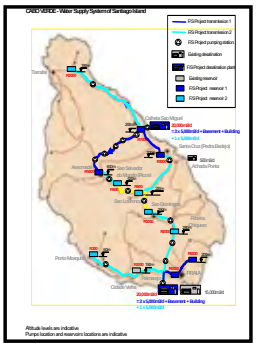
1-2 Outline of F/S Project



1-3 Each Report Topics

09/2009	03/2010	08/2010	10/2010	12/2010
IC/R	**PR/R**	**IT/R**	**DF/R**	***F/R***
- KOM - Methodology - Approach - Field Survey	- Horizon in 2020 - System Planning - Socio Analysis - donor projects - 3 candidates		- Cost Estimation for JICA scope and GoCV scope - Economics - Funding - ODA loan	- *comments* - *modification* - *correction*





- Water Analysis and Geotechnical Survey
- Basic Plan Development
- Project Feasibility Study including
  - Material Balance of SWRO System
  - Technical Specification Development
  - Project Risk and Pre Economics
- Operation and Maintenance proposal
- Initial Environmental Examination

2-1 Water Quality Analysis

Water quality analysis was conducted by the local laboratory, Inpharma.
Sampling water and its analysis results with some comments are as below:

a) Desalinated water from existing facilities in Praia and Santa Cruz
- Quality is generally within or close to the allowable level as drinking water
- Cl^- and Boron contents in Praia are slightly higher than WHO guideline

b) Beach well water for the existing plants in Praia and Santa Cruz
- No serious issue is found

c) Ground water near the candidate sites of the planned water distribution
- Quality of the water is within allowable level as drinking water
- Nitrate, Total Coliform and Total Hardness should be further investigated

d) Sea water around the candidate sites for the planned desalination facilities
- No serious issue for RO desalination application is found
- Ordinary pre-treatment is required for RO desalination
- Analysis result was applied to the planned facility design

2-2 Sampling Location and Desalinated Water

Current Desalinated Water Analysis

Sample Location / Sampling No.		Praia: SP 1-1, SP 1-2, 1-1, 1-2	St. Cruz: SS 1-1, SS 1-2	Dringking Water Regulation		
Analysis Item		Range	Range	WHO	EU	Japan
Item	Unit					
Temperature	℃	16.4 ~ 19.1	24.1 ~ 24.2			
pH	-	6.4 ~ 7.4 at 21 ℃	6.0 a 20 ℃	-	6.5 ~ 9.5	5.8 ~ 8.6
Conductivity	μS (cm)	940 ~ 1,100 at 25 ℃	220 ~ 230 at 25 ℃		2,500	
TDS	mg/l	770 ~ 790	160 ~ 180	1,000		200~500
Tubidity	NTU	<0.3 (LQ)	-	1 (Max 5)	-	<2 deg
Total Hardness	mg($CaCO_3$)	71.1	<9.6 (LQ)	-	-	<300
Chloride	mg (Cl^-)/l	320 ~ 800	64	<250	<250	<200
Boron	mg (B)/l	0.65 ~ 0.69	<0.05(LQ) ~ 0.51	<0.5*	<1.0*	<1.0*
Total Coliform Bacteria Count	ufc/100ml	0	0			

2-3 Ground Water Analysis

Sample Location / Sampling No.		1)Sao Miguel: FBE-145, FBE-205, FBE-188, FBE-112	2) St. Cruz: FBE-146, FT-09, FT-47, FT-59, FT-63	3) Assomada and Picos: FT-186, FBE-116, FBE-161, FBE-100, FBE-117	4) Sao Lourenco dos Orgaos: FT-145, FT-21, FT-23, FT-80, FT-84	5) Tarrafal: FBE-129, SST-04, FBE-131, FBE-113, FST-24	6) Sao Domingos: FBE-153, FBE-156, FT-81, PT-29, FT-208	7) Ribeira Grande de Santiago: 58-09, 58-01	8) Praia: FBE-58, FT-202, FBE-1A, FT-171	Dringking Water Regulation		
Analysis Item		Range	Range	Range	Range	Range	Range	Range	Range	WHO	EU	Japan
Item	Unit											
Temperature	℃	26.1~26.8	24.3 ~ 28.8	26.0 ~ 28.7	26.2 ~ 28.1	26.0 ~ 28.4	25.5 ~ 28.2	27.5 ~ 27.8	26.8 ~ 30.6			
pH	-	7.5 ~ 8.5 at 22 ℃	7.2 ~ 7.8 at 20 ℃	7.2 ~ 8.1 at 20 ℃	7.4 ~ 7.7 at 22 ℃	7.9 ~ 8.2 at 25 ℃	7.0 ~ 8.0 at 23 ℃	8.0 ~ 8.2 at 22 ℃	8.2 ~ 8.4 at 24 ℃	-	6.5~9.5	5.8~8.6
Tubidity	NTU	0.3(LQ) ~ 1.55	<0.3(LQ) ~ 0.62	<0.3 (LQ)	<0.3(LQ) ~ 0.68	<0.3(LQ) ~ 0.79	<0.3(LQ) ~ 0.72	<0.3 (LQ)	<0.3(LQ) ~ 0.41	1(Max 5)	-	<2 deg
Nitrate	mg(NO_3)/Ll	1.0(LQ) ~ 73.9	5.6 ~ 54.4	31.0 ~ 71.6	<1.0 ~ 54.4	12.4 ~ 16.6	<1(LQ) ~ 54	12.3 ~ 16.1	10.6 ~ 24.8	<50	<50	<10
Nitrite	mg(NO_2)/l	<0.01(LQ) ~ 0.02	<0.01 (LQ)	<0.01 (LQ)	<0.01(LQ) ~ 0.21	<0.01 (LQ)	<0.01 (LQ)	<0.01 (LQ)	<0.01 (LQ)	<3	<0.5	<0.05
Chloride	mg (Cl^-)/l	78 ~ 220	59 ~ 300	37 ~ 85	96 ~ 200	43 ~ 92	120 ~ 230	42 ~ 85	42 ~ 130	<250	<250	<200
Boron	mg (B)/l	0.05 ~ 0.14	0.06 ~ 0.13	0.05	<0.05 ~ 0.09	<0.05 ~ 0.06	0.07 ~ 0.12	<0.05(LQ)	<0.05(LQ) ~ 0.07	<0.5*	<1.0*	<1.0*
Fluorine	mg (F)/l	<0.5(LQ) ~ 2.2	<0.5(LQ) ~ 0.6	<0.5 (LQ)	<0.5 (LQ)	<0.5 (LQ)	<0.5 (LQ)	<0.5 (LQ)	<0.5 (LQ)	<1.5	<1.5	<0.8
Total Coliform Bacteria Count	ufc/100ml	0 ~ 130	0 ~ 610	92 ~ 3,400	0 ~ 576	0 ~ 3,600	0 ~ 16	38 ~ 1,200	31 ~ 36			
Standard Plate Count Bacteria	ufc/ml	0 ~ >300	0 ~ >300	0 ~ 36	0 ~ 28	0 ~ >300	0 ~ 40	83 ~ 89	0 ~ 82			
Fecal Coliform Bacteria Count	ufc/100ml	0	0 ~ 119	0 ~ 5,800	0 ~ 19	0 ~ 140	0 ~ 35.2	11 ~ 83	0 ~ 40			
Iron	μg (Fe)/l	<60 (LQ)	<60(LQ) ~ 130	<60 (LQ)	<60(LQ) ~ <93(LQ)	<60(LQ) ~ 100	60(LQ) ~ 1,900	<60 (LQ)	<60 (LQ)	<300	<300	<300
Total Hardness	mg($CaCO_3$)	11.7 ~ 497.7	189.7 ~ 575	98. ~ 148	149 ~ 418	96 ~ 138	200 ~ 770	111 ~ 136	84.1 ~ 217.1	-	-	<300
Arsenic	μg (As)/l	<1(LQ) ~ 12	<1 (LQ)	<1 (LQ)	<1 (LQ)	<1 (LQ)	<1 (LQ)	<1 (LQ)	<1 (LQ)	<10	<10	<10
Cadmium	μg (Cd)/l	<0.5 (LQ)	<0.5 (LQ)	<0.5 (LQ)	<0.5 (LQ)	<0.5 (LQ)	<0.5 (LQ)	<0.5 (LQ)	<0.5 (LQ)	<3	<5	<10
Mercury	μg (Hg)/l	<0.1 (LQ)	<0.1 (LQ)	<0.1 (LQ)	<0.1 (LQ)	<0.1 (LQ)	<0.1 (LQ)	<0.1 (LQ)	<0.1 (LQ)	<1	<1	<0.5
Cr+6	μg (Cr)/l	<2 (LQ)	<2 (LQ)	<2(LQ) ~ 4	<2 (LQ)	<2 (LQ)	<2(LQ) ~ 6	4	3 ~ 7	<50	<50	<50
Lead	μg (Pb)/l	<5 (LQ)	<5 (LQ)	<5 (LQ)	<5 (LQ)	<5 (LQ)	<5 (LQ)	<5 (LQ)	<5 (LQ)	<10	<10	<10
Manganese	μg (Mn)/l	<4(LQ) ~ 48	<4 (LQ)	<4 (LQ)	<4(LQ) ~ 80	<4 (LQ)	<4 (LQ)	<4 (LQ)	<4 (LQ)	<400	<50	<50

2-4 Geotechnical Survey

- 3 bore holes for SWRO facility
- 20 trial pits for Transmission line
- 4 laboratory tests for construction

Survey Results are under review, But no critical issues are found at moment.

Actual survey was conducted by Tecnasol, Portugal.

3-1 Population & Water Demand in 2020

Horizon of population in 2020 of the project targeted year was assumed to be about 370,566 persons in Santiago island in PR/R, but the horizon was newly assumed to be 355,319 persons by the latest Institute Nacional de Estatistics (INE).

The ratio of urban area to rural area was also newly assumed to be "60 to 40" instead of "66 to 34" in the island.
Water consumption rate was also re-estimated, and summarized as below:

	Urban	Rural
With public pipeline connection	150	80
Without public pipeline connection	50	50
For hotel user (tourist)	300	300

(unit: liter/day/person)

3-2 Water Demand and Production in 2020

items		South			South total	North						North total	Total	data source
		Praia	Ribeira Grande	Sao Domingos		Tarrafal	Sao Miguel	SS do Mundo	Santa Catarina	Santa Cruz	Sao Lourenco			
a. Target Year (2020) Population (person)		157,978	11,562	17,331	186,871	28,577	21,137	13,157	58,321	36,102	11,154	168,448	355,319	Institute Nacional de Estatistica (INE)
a1	- Urban	155,609	1,746	2,772	160,127	9,717	7,398	1,776	18,663	14,441	2,231	54,226	214,353	INE
a2	- Rural	2,369	9,816	14,559	26,744	18,860	13,739	11,381	39,658	21,661	8,923	114,222	140,966	INE
b. Overall Pipeline Service Coverage (%)		99.0%	90.0%	90.0%		95.0%	90.0%	80.0%	95.0%	95.0%	90.0%			Steering Committee (SAAS)
	in 2007	47.3%	10.9%	9.9%		64.1%	53.7%	15.4%	48.8%	76.9%	43.9%			INE
c. Served Population	Connection ratio in Urban, data by INGRH 100 %													
c1 =a x b	Overall population served by pipe network	156,398	10,406	15,598	182,402	27,148	19,023	10,526	55,405	34,297	10,039	156,438	338,839	Connection ratio (Urban Total)
c2 = a1 x CONE %	- Urban, with pipe connection	155,609	1,746	2,772	160,127	9,717	7,398	1,776	18,663	14,441	2,231	54,226	214,353	100%
c3 = c1-c2	- Rural, with pipe connection	789	8,660	12,826	22,275	17,431	11,625	8,750	36,742	19,856	7,808	102,212	124,486	Connection ratio (Rural Total)
c4 = a-c1	Overall population, NOT served by pipe	1,580	1,156	1,733	4,469	1,429	2,114	2,631	2,916	1,805	1,115	12,011	16,480	88%
c5 = a1-c2	- Urban, without pipe connection	0	0	0	0	0	0	0	0	0	0	0	0	
c6 = a2-c3	- Rural, without pipe connection	1,580	1,156	1,733	4,469	1,429	2,114	2,631	2,916	1,805	1,115	12,011	16,480	
d. Per-Capita Average Demand (liter/person/day)														
d1	- Urban, with pipe connection	150	150	150		150	150	150	150	150	150			INGRH
d2	- Rural, with pipe connection	80	80	80		80	80	80	80	80	80			INGRH
d3	- Urban, without pipe connection	50	50	50		50	50	50	50	50	50			INGRH
d4	- Rural, without pipe connection	50	50	50		50	50	50	50	50	50			INGRH
e. Domestic demand (m3/day)														
e1 = c2 x d1	- Urban, with pipe connection	23,341	262	416	24,019	1458	1110	266	2799	2166	335	8,134	32,153	
e2 = c3 x d2	- Rural, with pipe connection	63	693	1026	1,782	1394	930	700	2939	1588	625	8,177	9,959	
e3 = c5 x d3	- Urban, without pipe connection	0	0	0	0	0	0	0	0	0	0	0	0	
e4 = c6 x d4	- Rural, without pipe connection	79	58	87	223	71	106	132	146	90	56	601	824	
A. = e1+e2+e3+e4	Domestic Demand (m3/day)	23,483	1,012	1,529	26,024	2,923	2,145	1,098	5,885	3,845	1,015	16,911	42,936	
f. Tourizm Demand														
f1	Number of Beds (beds)	2,400	100	100	2,600	200	100	0	500	200	0	1,000	3,600	MTIE(Tourism dept) + Study team
f2	Expected Average Occuppancy	70%	70%	70%		70%	70%	70%	70%	70%	70%			Study team
f3	Per-Capita Demand (litter/bed/day)	300	300	300		300	300	300	300	300	300			MTIE(Tourism dept) + Study team
f = f1 x f2 x f3	Tourism Sub total (m3/d)	504	21	21	546	42	21	0	105	42	0	210	756	
g. Industries, office, hospital, others (m3/day)		3,000	0	50	3,050	50	100	0	500	100	0	750	3,800	MTIE(Industry dept) + Study team
B = f + g	Non-Domestic Demand (m3/day)	3,504	21	71	3,596	92	121	0	605	142	0	960	4,556	
C = A + B	Total Net Water Demand (m3/day)	26,987	1,033	1,600	29,620	3,015	2,266	1,098	6,490	3,987	1,015	17,871	47,492	
h.	Leakage Ratio (%)	15	15	15		15	15	15	15	15	15		15	Steering Committee (SAAS)
	NOW	24	20	10		24	16	20	28	28	10		24	SAAS
D = C /(100% - h%)	Day Average Demand (m3/day)	31,750	1,216	1,882	34,848	3,548	2,666	1,292	7,635	4,690	1,194	21,025	55,873	
i.	Seasonal Peak Factor (Tourism)	1.4	1.4	1.4		1.4	1.4	1.4	1.4	1.4	1.4			Study team
j. f x (i-1) / (100%-h%)	Seasonal Additional Demand (m3/day)	237	10	10	257	20	10	0	49	20	0	98	356	
E = D + j	Daily Maximum Demand (m3/day)	31,987	1,226	1,892	35,105	3,567	2,676	1,292	7,684	4,710	1,194	21,124	56,229	
		57%	2%	3%	62%	6%	5%	2%	14%	8%	2%	38%	100%	
2. Existing plant, including planned plant														
	Existing Desalination Plant	5,000	(Palmarejo)		5,000					0		0	5,000	
	Planned plant									(Achada Ponta)				
	by Spanish fund	5,000	(Palmarejo)		5,000							0	5,000	
	by World Bank fund	5,000	(Palmarejo)		5,000							0	5,000	
	Total				15,000							0	15,000	
3. Necessary additional plant (1-2)														
	Detail figure (m3/d)				20,105							21,124	41,229	
	Round figure (m3/d)				20,000							20,000	40,000	

11

3-3 F/S Project Production Capacity

For decision of the F/S Project capacity, followings are applied:

- Whole potable water demand in 2020: 56,229m^3/day (round 55,000m^3/day)
- Existing Desalination Capacity in 2010: 5,000m^3/day, in Praia
- Firmly Planned expansion plant: 5,000m^3/day by Spain in Praia
- Firmly Planned plant: 5,000m^3/day by WB in Praia
- Additional Capacity for whole demand: **40,000m^3/day in island**
  (= 55,000 - 5,000 x 3units)

It is noted that small desalination plants with capacity of 500 and 1,200m^3/day production are already put in service, and
some private based desalination projects are planned.
Those capacities were not counted due to uncertainty.

3-4 Drinking Water Quality and Boron

a. The drinking water quality supplied by the F/S Project basically follows WHO guidelines for Drinking Water, 3rd edition, 2008.

b. Expected Boron content produced by the new desalination facility is less than 0.5mg/liter.

c. Boron content was declared to be from less than 0.5 to less than 1.0mg/liter at 29-07-2010 by the Ministry of Health, Cape Verde by the Decree Law nº 8/2004 of 02/23/2004, B. O. nº 6.

d. Though Boron content was declared,
The current technical specification will not be changed.
0.5mg/liter is expected performance, the proper operation and maintenance will be required to keep the performance.

3-5 Ground Water Utilization

Ground water utilization was studied and discussed from the view points of
- the project investment cost reduction,
- Boron content reduction, and
- drinking water quality improvement.

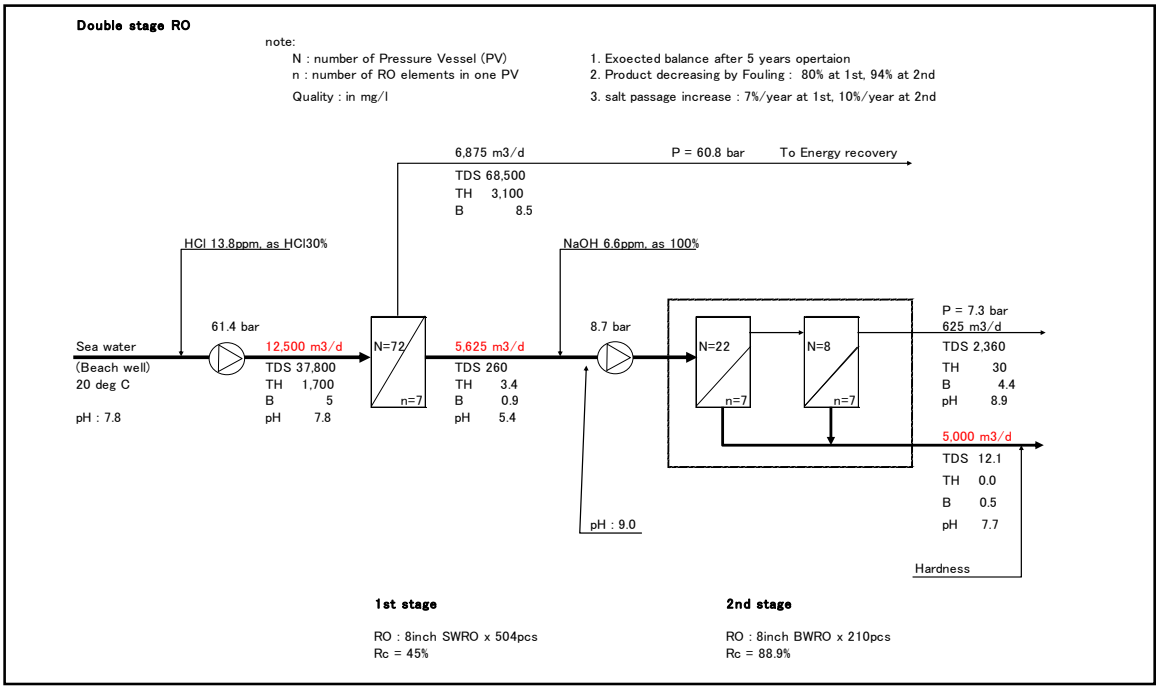
Due to the following reasons, no utilization of ground water for the study is concluded.

a. Investment cost impact might be very small if ground water will be utilized. Ground water production is about 4,000m^3/day, but demand is about 56,000m^3/day.

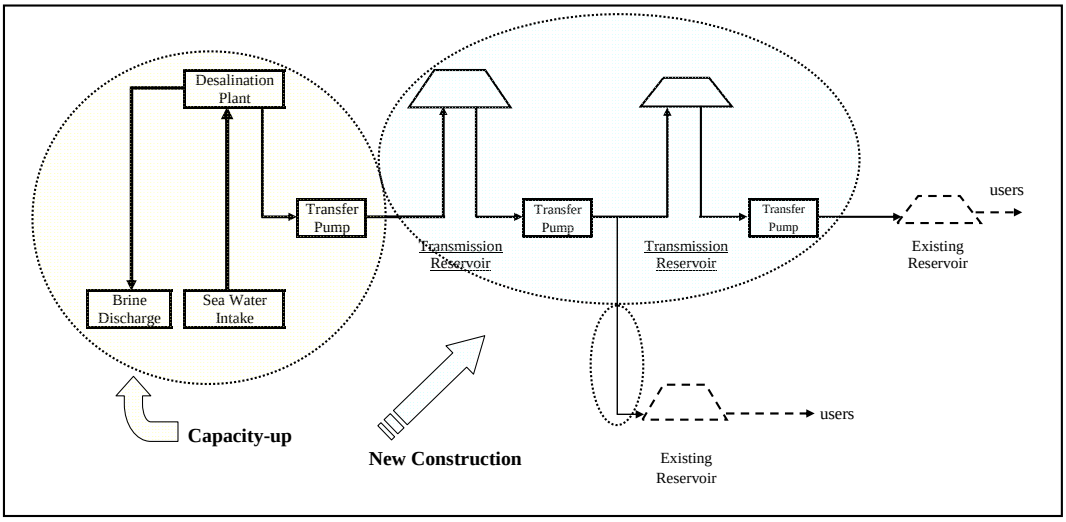
b. No ground water is required to reduce Boron content in desalinated water, if 2 stage RO system will be applied,

c. Cape Verde Government policy, ground water will be utilized for irrigation purpose after completion of enough network of desalinated water.

3-6 Material Balance and Boron Removal



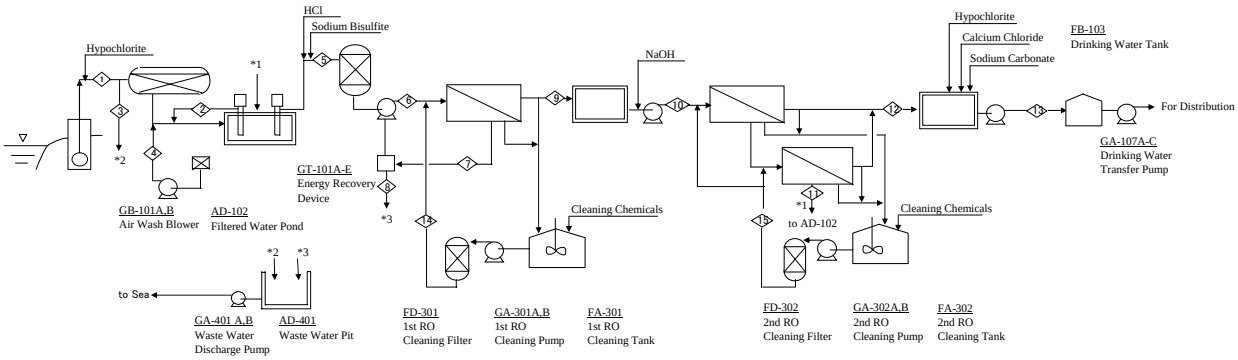
4-1 F/S Project Scope



1. Capacity up of Water Production
2. New Construction of Water Transmission

4-2 Sea Water Desalination Facility, *Flow Sheet*

AD-101A-I Intake Well
FD-101A-I Sand Filter
FD-102A-E Safety Filter
CJ-101A-D 1st Stage RO Unit
FB-101 Intermediate Tank
CJ-102A-D 2nd Stage RO Unit
FB-102 Product Water Tank
GA-101A-I Sea Water Intake Pump
GA-102A,B Sand Filter Backwash Pump
GA-103A-E Safety Filter Feed Pump
GA-104A-E 1st Stage RO Feed Pump
GA-105A-E 2nd Stage RO Feed Pump
GA-106A-C Product Water Pump



Stream No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Description	Feed Sea Water	Filter Backwash Water	Backwash Waste to Sea	Filter Backwash Air	Safety Filter Feed	1st RO Feed Water	1st RO Brine	Brine Discharge to Sea	1st RO Permeate	2nd RO Feed Water	2nd RO Brine to Sea	2nd RO Permeate	Product Water	1st RO Cleaning Water	2nd RO Cleaning Water
Flow m3/d	50,000	–	–	–	50,000	50,000	27,500	27,500	22,500	22,500	2,500	20,000	20,000	–	–
Flow m3/h	2,083	580	580	1,160	2,083	2,083	1,146	1,146	937	937	104	833	833	430	180
Operation time	24 h/d	10min x 8 times/d	10min x 8 times/d	3min x 8 times/d	24 h/d	24 h/d	24 h/d	24 h/d	24 h/d	24 h/d	24 h/d	24 h/d	24 h/d	–	–
Temp ℃	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Pressure kg/cm2G	3.0	2.0	1.0	0.5	2.0	61.4	60.8	1.0	1.0	11.0	1.0	1.0	5.0	5.5	5.5
TDS mg/l	37,800	37,800	37,800	–	37,800	37,800	68,500	68,500	260	260	2,360	12	12	12	12
Total Hardness mg/l as CaCO3	6,368	6,368	6,368	–	6,368	6,368	11,567	11,567	13	13	113	0	15	0	0
pH	7.8	7.8	7.8	–	7.8	7.8	7.5	7.5	5.4	8.7	8.9	7.7	7.7	–	–
Boron mg/l	5.0	5.0	5.0	–	5.0	5.0	8.5	8.5	0.9	0.9	4.0	0.5	0.5	–	–

PROCESS FLOW DIAGRAM
20,000m3day/day Desalination Facility in Palmarejo
DWG.NO.

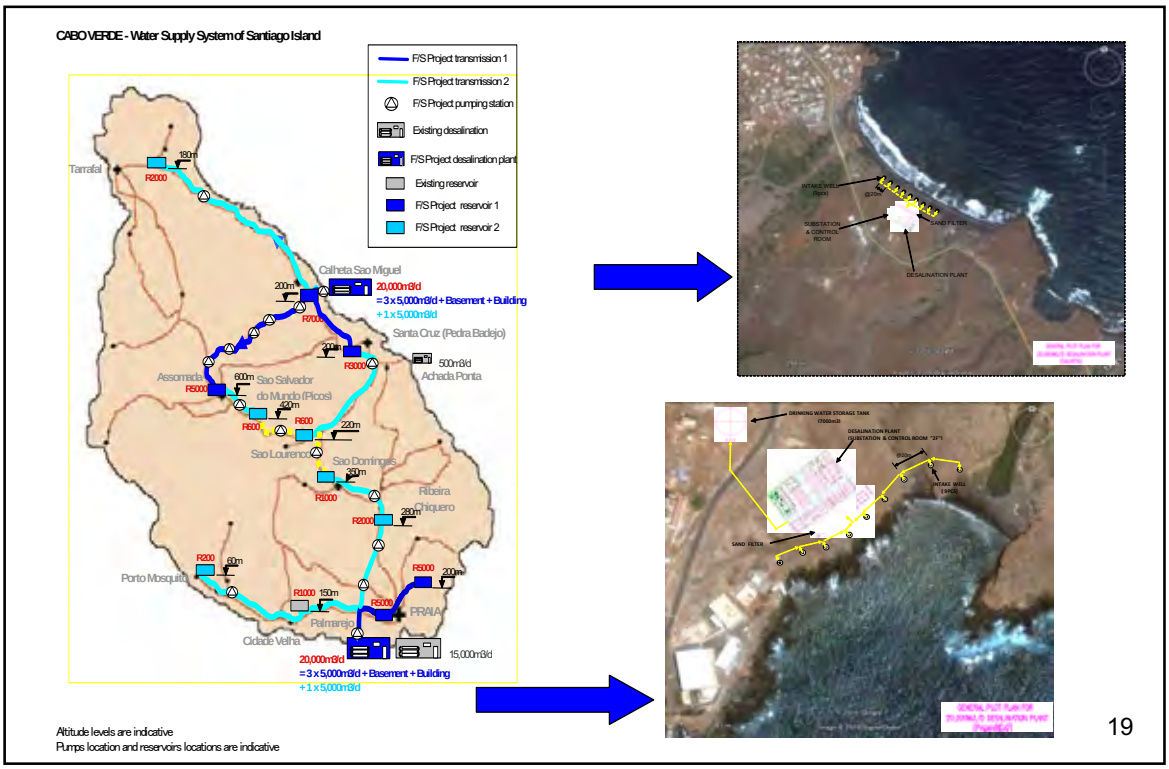
Palmarejo and Calheta are almost same

4-2 Sea Water Desalination Facility, *Equipment List*

Item No.	Service	No.	Type	Short Specification	Motor kW	Material
AD-101A-I	Intake Well	8+1		14″ x 50000mmDepth		
AD-102	Filtered Water Pond	1	Semi-UG	520m3, 10000mmW x 13000mmL x 4500mmH		Concrete
AD-401	Waste Water Pit	1	AG	240m3, 8000mmW x 7500mmL x 4500mmH		Concrete
CJ-101A-D	1st Stage RO Unit	4 blocks		72 Pressure Vessels, 7 elements/PV, 8″element 5000mmW x 6000mmH x 8000mmL		
CJ-102A-D	2nd Stage RO Unit	4 blocks		30 Pressure Vessels, 7 elements/PV, 8″element 3000mmW x 6000mmH x 7500mmL		
FA-201	Hypochlorite Tank	1	Cone Roof	10m3, 2400mmID x 2600mmH, by Drum		FRP
FA-202	HCl Tank	1	Cone Roof	10m3, 2400mmID x 2600mmH, by Lorry		FRP
FA-203A,B	SBS Tank	2	Cone Roof	10m3, 2400mmID x 2600mmH, by Bag & Dissolving		FRP
FA-204	NaOH Tank	1	Cone Roof	10m3, 2400mmID x 2600mmH, by Lorry		FRP
FA-205A,B	Calcium Chloride Tank	2	Cone Roof	10m3, 2400mmID x 2600mmH, by Bag & Dissolving		FRP
FA-206A,B	Sodim Carboronate Tank	2	Cone Roof	10m3, 2400mmID x 2600mmH, by Bag & Dissolving		FRP
FA-301	1st RO Cleaning Tank	1	Cone Roof	20m3, 2400mmID x 6000mmH		FRP
FA-302	2nd RO Cleaning Tank	1	Cone Roof	10m3, 2000mmID x 4000mmH		FRP
FB-101	Intermediate Tank	1	Semi-UG	200m3, 4000mmW x 9000mmL x 6000mmH		Concrete
FB-102	Product Water Tank	1	Semi-UG	200m3, 4000mmW x 9000mmL x 6000mmH		Concrete
FB-103	Drinking Water Storage Tank	1	Cone Roof	7000m3 @Palmarejo, 29000mmID x 12000mmH		CS/Epoxy
FD-101A-H	Sand Filter	8+1	Horizontal	2400mmID x 8000mmL, Sand and Anthracite		CS/Rubber
FD-102A-E	Safety Filter	4+1	Vertical	1200mmID x 3000mmH, 5 micron Cartridge		CS/Rubber
FD-301	1st RO Cleaning Filter	1	Vertical	1200mmID x 3000mmH, Cartridge		CS/Rubber
FD-302	2nd RO Cleaning Filter	1	Vertical	800mmID x 3000mmH, Cartridge		CS/Rubber
GA-101A-I	Sea Water Intake Pump	8+1	Submerged	270m3/h x 50mH	55kW	Duplex SS or 316SS
GA-102A,B	Sand Filter Backwash Pump	1+1	Centrifugal	580m3/h x 20mH	55kW	Duplex SS or 316SS
GA-103A-E	Safety Filter Feed Pump	4+1	Centrifugal	530m3/h x 20mH	45kW	Duplex SS or 316SS
GA-104A-E	1st Stage RO Feed Pump	4+1	Centrifugal	530m3/h x 700mH	1400kW	Duplex SS or 316SS
GA-105A-E	2nd Stage RO Feed Pump	4+1	Centrifugal	240m3/h x 110mH	110kW	316SS
GA-106A-C	Product Water Pump	2+1	Centrifugal	420m3/h x 50mH	90kW	304SS
GA-107A-C	Drinking Water Transfer Pump	2+1	Centrifugal	420m3/h x 50mH @Parmarejo	90kW	304SS
GA-201A-D	Hypochlorite Injection Pump	2+2	Diaphragm	40L/h x 20mH	0.4 kW	SS/PTFE
GA-202A,B	HCl Injection Pump	1+1	Diaphragm	40L/h x 20mH	0.4 kW	SS/PTFE
GA-203A,B	SBS Injection Pump	1+1	Diaphragm	60L/h x 20mH	0.4 kW	SS/PTFE
GA-204A,B	NaOH Injection Pump	1+1	Diaphragm	60L/h x 20mH	0.4 kW	SS/PTFE
GA-205A,B	Calcium Chloride Injection Pump	1+1	Diaphragm	250L/h x 20mH	1.1 kW	SS/PTFE
GA-206A,B	Sodium Carbonate Injection Pump	1+1	Diaphragm	500L/h x 20mH	2.2 kW	SS/PTFE
GA-301A,B	1st RO Cleaning Pump	1+1	Centrifugal	430m3/h x 55mH	110kW	316SS
GA-302A,B	2nd RO Cleaning Pump	1+1	Centrifugal	180m3/h x 55mH	45kW	316SS
GA-401A,B	Waste Water Discharge Pump	1+1	Centrifugal	1400m3/h x 20mH	110kW	Duplex SS or 316SS
GB-101A,B	Air Wash Blower	1+1	Roots	1160m3/h x 4.5mH	30kW	CI
GD-203A,B	SBS Tank Mixer	2	Vertical		1.1 kW	CS/Rubber
GD-205A,B	Calcium Chloride Tank Mixer	2	Vertical		1.1 kW	CS/Rubber
GD-206A,B	Sodium Carbonate Tank Mixer	2	Vertical		1.1 kW	CS/Rubber
GD-301	1st RO Cleaning Tank Mixer	1	Vertical		1.1 kW	CS/Rubber
GD-302	2nd RO Cleaning Tank Mixer	1	Vertical		1.1 kW	CS/Rubber
GT-101A-E	Energy Recovery Device	4+1				
GF-401	Air Supply Package	1		300Nm3/h, with Air Compressor and Dryer	30kW	

Palmarejo and Calheta are almost same

4-2 Sea Water Desalination Facility, *General Layout*



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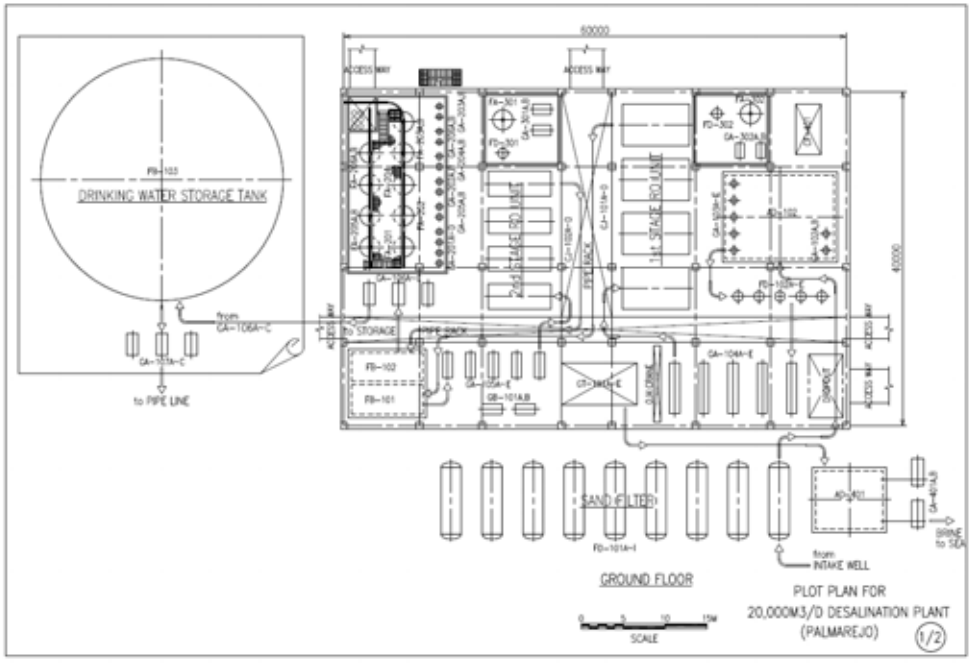
4-2 Sea Water Desalination Facility, *Plot Plan*



Palmarejo and Calheta are almost same

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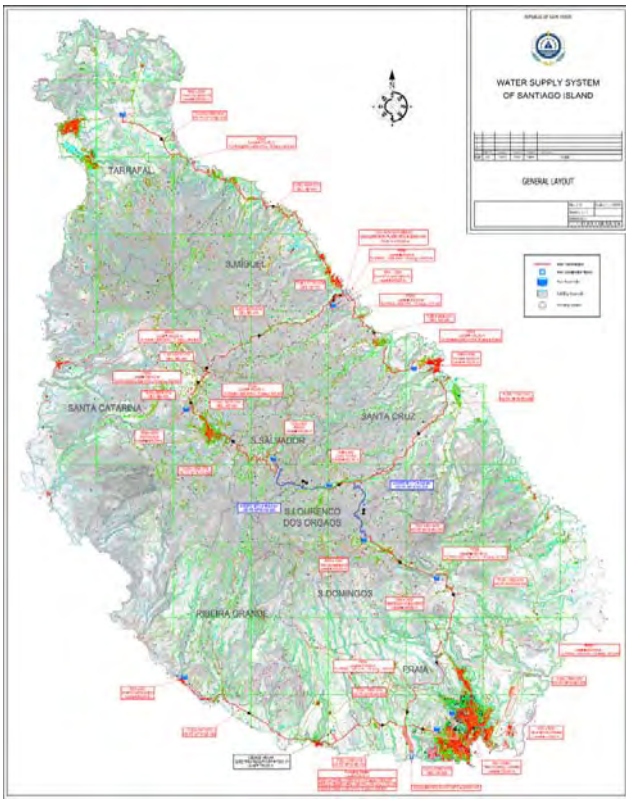
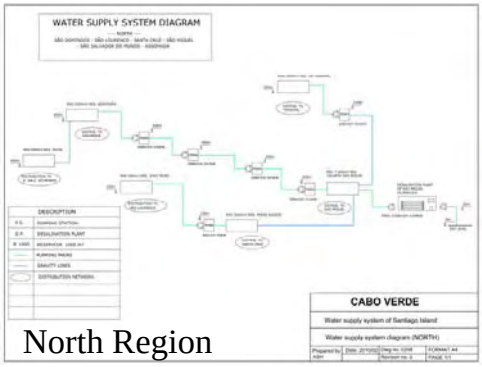
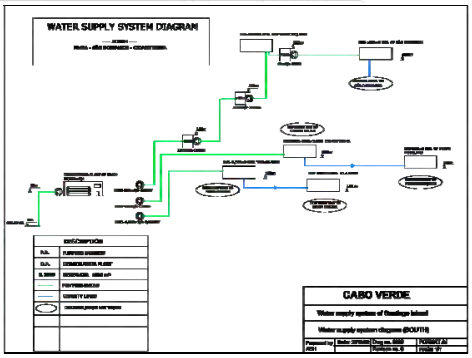
4-3 Water Transmission Facility, *General Layout*





North Region



South Region

4-3 Water Transmission Facility, *transmission lines*

South Area

No.	Start	End	Type	Length (km)	Material
SA1 : Network for Praia Center					
TLS1	PSS1 Praia WTP*	RS1-5000 / RS2-5000	Pumped	8.000	500 DICL
SA2a : Network for Ribeira Grande					
TLS2	PSS2 Praia WTP*	Existing Cidade Verlha Tank	Pumped	8.000	250 HDPE PN 16
TLS3	Existing Cidade Verlha Tank	RS3-200	Gravity	13.200	160 HDPE PN16
SA2b : Network for Sao Domingos					
TLS4	PSS3 Praia WTP*	PSS4	Pumped	5.000	225 HDPE PN 16
TLS5	PSS4	PSS5	Pumped	6.500	225 HDPE PN 16
TLS6	PSS5	RS4-2000	Pumped	4.700	225 HDPE PN 16
TLS7	PSS6	RS5-1000	Pumped	5.700	200 HDPE PN 16

North Area

No.	Start	End	Type	Length (km)	Material
N0 : Network for all the North Area					
TLN1	PSN1 Calheta WTP	RN1-7000 Calheta tank	Pumped	1.300	500 DICL
NA1a: Network for Santa Catarina - Assomada					
TLN2	PSN2	PSN3	Pumped	9.700	400 DICL
TLN3	PSN3	PSN4	Pumped	1.600	400 DICL
TLN4	PSN4	PSN5	Pumped	2.300	400 DICL
TLN5	PSN5	RN2-5000 Assomada	Pumped	1.000	400 DICL
NA1b : Network for Santa Cruz					
TLN7	RN1-7000	RN5-3000 Pedra Badejo	Gravity	11.200	300 DICL
NA2a: Network for Tarrafal					
TLN9	RN1-7000	PSN7	Gravity	20.000	400 DICL
TLN10	PSN7	RN4-2000 Tras Os Montes	Pumped	6.000	315 HDPE PN 16
NA2b: Network for Sao Salvador Do Mundo					
TLN6	RN2-5000	RN3-600 Picos	Gravity	9.800	200 HDPE PN16
NA2c:Network for Sao Lorenco					
TLN8	PSN6	RN3-600 Joao Teves	Pumped	16.400	250 HDPE PN16

LOOP SECTIONS (optional sections)

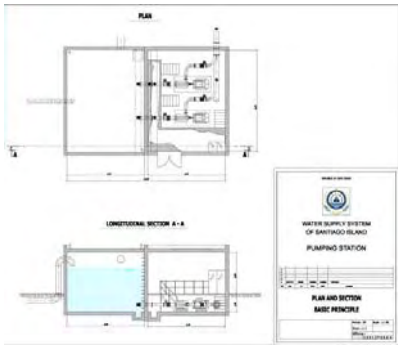
Loop sections are proposed to complete and to secure the networks for total water supply system.

Loop sections are optional and are not included in the F/S Project.

4-3 Water Transmission Facility, *pump & reservoir*

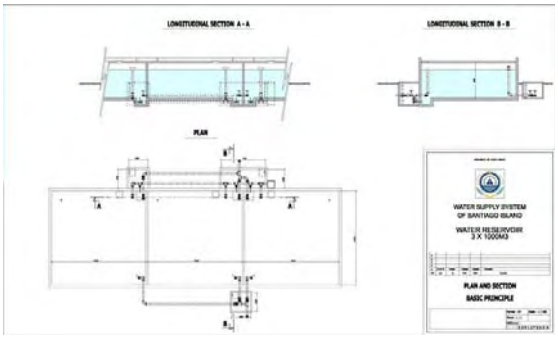
Pumping Station

No.	Flow (m3/h)	Pressure (barg)	Total Installed power (kw) For CAPEX	Power consumption (KW) For OPEX
PSS1	1599	16.0	1,661	1,110
PSS2	98	15.7	134	70
PSS3	126	14.1	154	80
PSS4	126	17.6	193	100
PSS5	126	14.7	161	85
PSS6	42	14.0	51	30
PSN1	1056	18.2	1,249	840
PSN2	598	13.3	689	350
PSN3	598	10.4	539	275
PSN4	598	10.6	552	280
PSN5	598	10.2	528	270
PSN6	80	13.7	95	50
PSN7	238	14.6	301	160



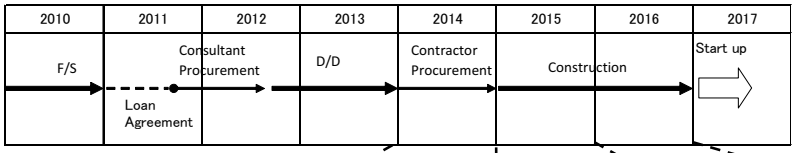
Reservoir

Name	Description	Capacity (m3)	Elevation (m)
RS1-5000	Praia – Tira Chapeu	5 x 1000 = 5.000	120
RS2-5000	Praia- Vila Nova	5 x 1000 = 5.000	110
Existing	Existing reservoir Cidade Velha	1 x 1000 = 1,000	150
RS3-200	Porto Mosquito	1 x 200 = 200	60
RS4-2000	Ribeiro Chiquero	2 x 1000 = 2,000	320
RS5-1000	Sao Domingos	1 x 1000 = 1,000	450
RN6-600	Joao Teves	1 x 600 = 600	220
RN5-3000	Pedra Badejo	3 x 1000 = 3,000	120
RN3-600	Picos	1 x 600 = 600	420
RN1-7000	Calheta Sao Miguel	7 x 1000 = 7,000	200
RN2-5000	Assomada	5 x 1000 = 5,000	600
RN4-2000	Tras Os Montes	2 x 1000 = 2,000	220



4-4 Implementation Planning

- No critical issue of the construction of the system is found.
- Due to the long transmission line construction, plural construction teams would be organized for the effective and reasonable planning.



DESCRIPTION		YEAR	Year 1											Year 2											Year 3										
		Calendar Mth	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
		Project Mth	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
GENERAL SCHEDULE		Construction Team No.	Contractor Procurement												Construction																							
North Area																																						
N1	Desalination Facility Construction and Installation																																					
	Water Transition Facility Construction	2 teams																																				
N2	Desalination Facility Installation																																					
	Water Transition Facility Construction	3 teams																																				
	Commissioning																									N1◆											N2◆
South Area																																						
S1	Desalination Facility Construction and Installation																																					
	Water Transition Facility Construction	1 team																																				
S2	Desalination Facility Installation																																					
	Water Transition Facility Construction	1 team																																				
	Commissioning																									S1◆											S2◆

4-5 Project Risk

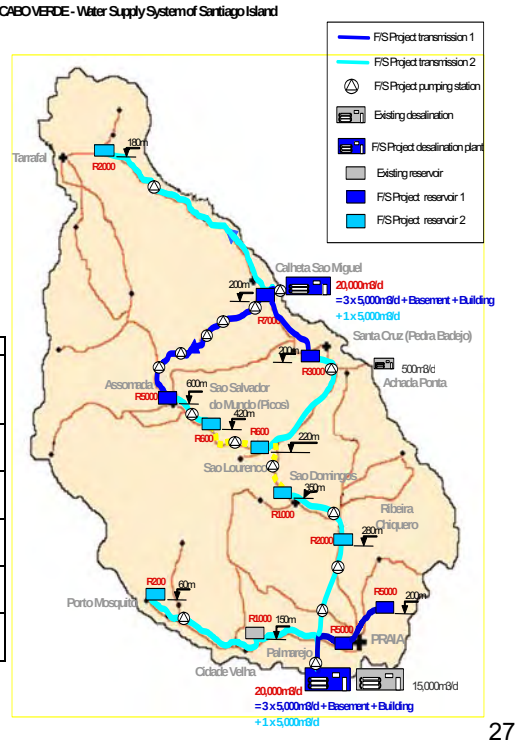
		Risk Occurrence Possibility			Risk Description	Countermeasure
		low	medium	high		
Technical						
	Capacity	✓				
	Sea Water Specification	✓				
	Potable Water Specification	✓				
	Water Transmission		✓		unforseen obstacle or soil condition	route change will be discussed
	Power Supply		✓		emergency failure	emergency generator will be installed
	Beach Well Water		✓		water volume decreasing	another well will be newly digged
	Regulation	✓				
Commercial						
	Funding	✓				
	Yen Loan	✓				
	Market	✓				
	Inflation	✓				
	Concession	✓				
Environment						
	Regulation	✓				
	Permission	✓				
	Natural Conditions	✓				
	Social Consideration	✓				
others						
	Policy	✓				
	Human Resources	✓				
	Construction Site	✓				
	Operation		✓		operation material shortage	material will be purchased
	Maintenance		✓		maintenance material shortage	material will be purchased
	other projects impact	✓				

4-6 (1) Economics Analysis, - *presupposition* -

- Case “Total”, “S1”, “S2”, “N1” and “N2” are studied … ref 4-6(2)
- Production capacity, in “Total” case … ref 4-6(3)
  - Production: 40,000m^3/d, with 365days/year operation
  - Sales : around 85% (34,500m^3/d) of production
  - No safety margin is considered
- Project period
  - Construction : 2 years for EPC, including trial run … ref 4-4
  - Project life for Economics analysis : 20 years
- Financial condition
  - Equity:15%
  - Loan: 85% (25years Yen loan from Japanese Government, 1.4% p.a. interest)
  - Investment 60% at 1st year, 40% at 2nd year
- Project cost: as per slide 4-6(4)
- Tariff: 5.0US$/$m^3$ (395CVE/m^3) in 2020, in base case … ref 4-6(5)
- Depreciation
  - Manner of depreciation : Straight-line method, with Zero salvage value
  - Service life : 20 years, for Economics Analysis purpose
- Unit cost for study
  - Electricity: 21CVE/kWh (=0.265US$/kWh), based on ELECTRA tariff
  - 10,000 US$/year/person, including overhead
  - Maintenance, including membrane, chemical are considered accordingly

4-6 (2) Project Scoping, - *each project* -

Project Name	SWRO						Transmission and reservoirs for	
	Location	Train capacity (m3/d)	trains (unit)	Total quantity (m3/d)	Civil work		Service Area	m3/d
					Civil work, including equipment base	Building		
S1	Palmarejo	5,000	3	15,000	for all (4 trains)	for all (4 trains)	Praia	15,000
S2	Palmarejo	5,000	1	5,000	---	---	Ribiera Grande Sao Domingo	5,000
N1	Calheta	5,000	3	15,000	for all (4 trains)	for all (4 trains)	Sao Miguel Santa Catarina Santa Cruz	15,000
N2	Calheta	5,000	1	5,000	---	---	Tarrafal SS.Mundo Sao Laurence	5,000
Total				40,000				40,000



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Altitude levels are indicative
Pumps location and reservoirs locations are indicative

4-6 (3) Production and Sales Plan (unit: m^3/day)

Project name			Delivery (Sales) = Production − Leakage	Leakage = Production x 15%	Production			
Name	Service Area	Population, in 2020 (persons)			Delivery + Leakage	Round figure	F/S Project	Others (Spain, WB)
by others	Praia	157,978	*13,500*	*2,382*	*15,882*	*15,000*	---	*15,000*
S1			13,500	2,382	15,882	15,000	15,000	---
S2	Ribiera Grande Sao Domingo	28,893	3,000	529	3,529	5,000	5,000	0
N1	Sao Miguel Santa Catarina Santa Cruz	115,560	13,000	2,294	15,294	15,000	15,000	0
N2	Tarrafal SS.Mundo Sao Laurence	52,888	5,000	882	5,882	5,000	5,000	0
Total (S1+S2 +N1+N2)		355,319	34,500	6,088	40,588	40,000	40,000	0
		Others	*13,500*					*15,000*
		Grand Total	48,000				55,000	

4-6 (4) F/S Project Cost, *- preliminary -*

Project name		Plant Cost					Project Cost
		SWRO		Transmission		Total	(= Plant cost x 1.4)
Name	Service Area	*m3/d*	mio $	*m3/d*	mio $	mio $	mio $
S1	Praia	*15,000*	23.2	*15,000*	8.6	31.8	44
S2	Ribiera Grande Sao Domingo	*5,000*	5.8	*5,000*	13.7	19.5	27
N1	Sao Miguel Santa Catarina Santa Cruz	*15,000*	23.2	*15,000*	24.8	48.0	67
N2	Tarrafal SS.Mundo Sao Laurence	*5,000*	5.8	*5,000*	19.3	25.1	35
Connection						0.0	0
Total		*40,000*	58.0	*40,000*	66.4	124.4	174

Project cost is calculated by adding project implementation cost in future such as consultant fee, land acquisition fee, detail design fee etc. From in-house data, 1.4 times of Plant cost is applied.

4-6 (5) Current Sales Price, *tariff*

Area		South					North									
Project name		S1	S2			South total	N1				N2				North total	Total
Municipality		Praia	Ribeira Grande	Sao Domingos	Average		Sao Miguel	Santa Catarina	Santa Cruz	Average	Tarrafal	SS do Mundo	Sao Lourenco	Average		
Tariff in 2008, consumption range of 6m3/month	*CVE.m3*	***333***	*354*	*280*	***309***	*331*	*280*	*120*	*280*	***198***	*134*	*310*	*150*	***175***	*192*	***279***
	US$/m3	***4.2***	*4.5*	*3.5*	*3.9*	*4.2*	*3.5*	*1.5*	*3.5*	*2.5*	*1.7*	*3.9*	*1.9*	*2.2*	*2.4*	*3.5*
Sales quantity in 2020 (m3/d)	Normal	26,987	1,033	1,600		29,620	2,266	6,490	3,987		3,015	1,098	1,015		17,871	47,491
	Peak	237	10	10		257	10	49	20		20	0	0		99	356
	Total	27,224	1,043	1,610		29,877	2,276	6,539	4,007		3,035	1,098	1,015		17,970	47,847
			2,653				12,822				5,148					
	Round Figure	**13,500**	**3,000**			(30,000)	**13,000**				**5,000**				(18,000)	**34,500**
	by Others	13,500														

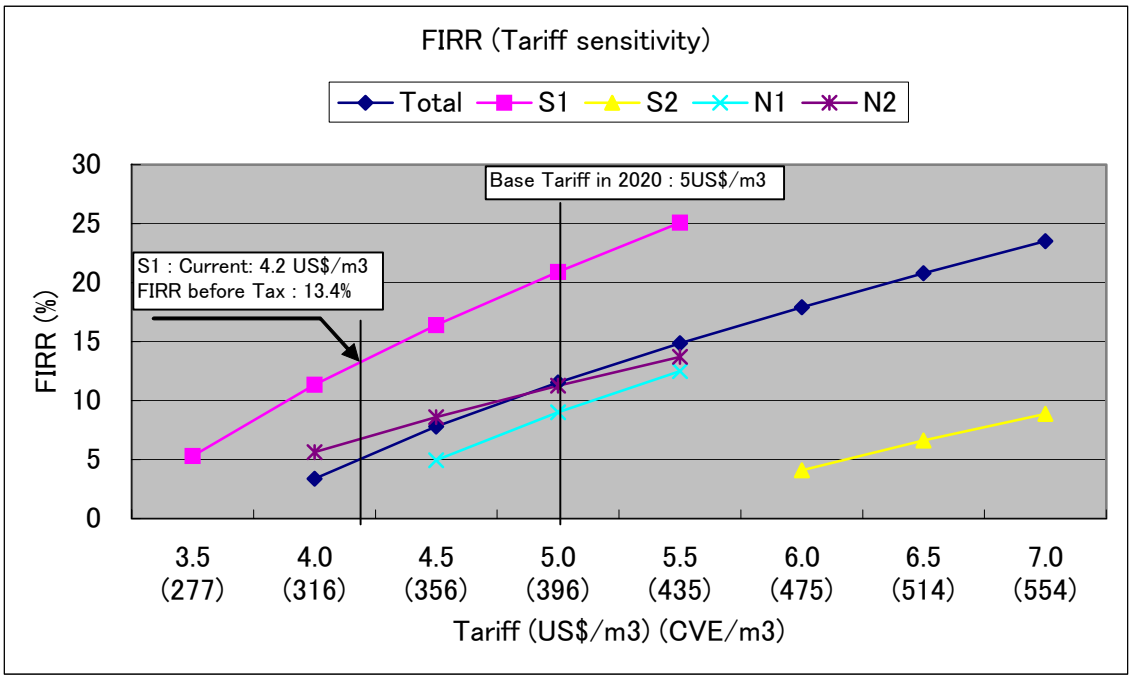
USD 1 = 79.1 CVE
Praia area 333 CVE/m3= 4.2 USD/m3
Other Praia 207 CVE/m3= 2.6 USD/m3

Data source: Electra for Praia, and SAAS for other municipality than Praia

Average tariff in other area than Praia is 207 CVE/m3. According to Social survey in 2009 by JICA study team, these area

may accept tariff increase up to 200-350 CVE/m3 (=1.7 times max). Therefore 1.4 times of average tariff of 279 CVE/m3 (=3.5 US$/m3) (= 5US$/m) is set as base case in 2020.

4-6 (6) F-IRR Calculation Results, - *preliminary* -



5US$/m3 is enough feasibility in all cases except “S2”.

4-6 (7) Economics Analysis, - *summary* -

(a) Summary of profitability study

S1 shows most stable financial result from view points of F-IRR and DSCR.

F-IRR: 20.9% @ 5.0US$/$m^3$ at base tariff

13.4% @ 4.2US$/$m^3$ at current tariff

DSCR: 3.67 and higher @ 1st Operation year and afterward

(b) Tariff of potable water

Sales price is set up only based on the current tariff of potable water.

This tariff shall be politically adjusted.

All cases except “S2” show healthy financial economics.

In case people cannot accept this tariff,

the subsidy application by the GoCV is recommended.

5. Operation and Maintenance Planning

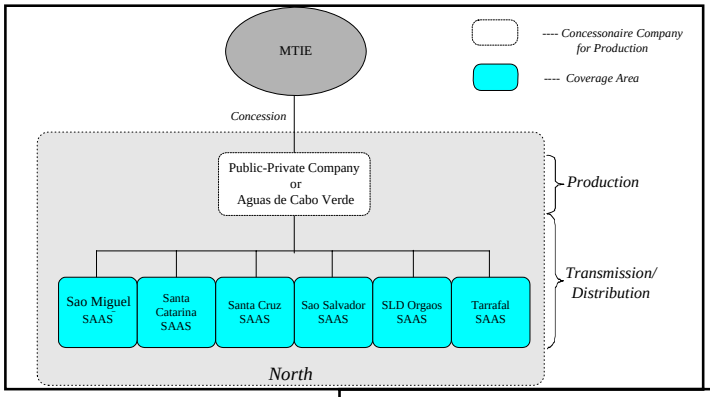
There is no organization which comprehensively manages and supervises waterworks and O&M at whole island level.

Considering the current waterworks situation and the project nature, the O&M systems in the transition period and in the future are recommended.

In the transition period, two water supply systems will be established in the south and the north in the island. The desalinated water produced by 2 desalination facilities in the southern and the northern regions will be transmitted and distributed to target municipalities.

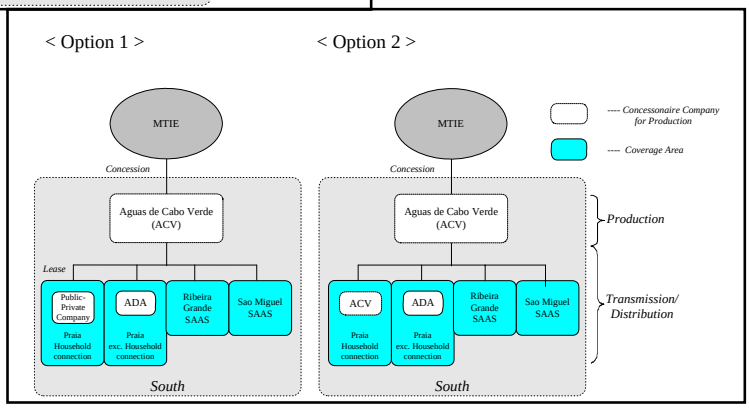
As a future scenario, establishing an inter-municipal public holding company will manage and supervise the water supply system comprehensively in southern and northern regions.

5-1 O&M Planning in Transition Period

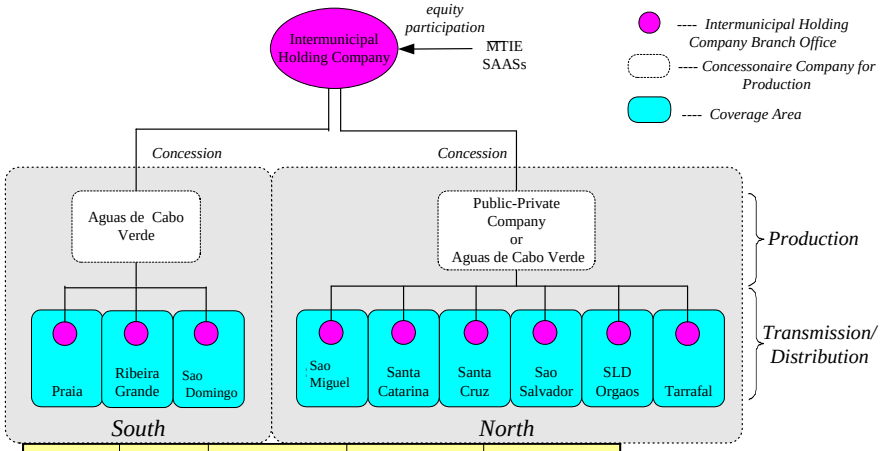


North Region

South Region



5-2 O&M Planning in Future



Region	Ownership/ Role	Production	Transmission	Distribution
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

6. Initial Environmental Examination, IEE

IEE of the F/S Project took place from October 2009 to July 2010.

IEE has been carried out in accordance with the JBIC Guidelines dated April 2002 and relevant laws of the GoCV.

In IEE stage, general environmental impacts were presumed according to the dialogue with local stake holders for environmental management through “Inter-municipal Meeting for Environmental issues” conducted by the Study team on May 2010 in Praia.

As conclusion, general measures for environmental management are summarized in each municipality’s Municipality Development plan (PDM) and Municipality Environmental plan and those measures should be considered at the stage of the F/S Project formation and IEE and EIA.

7-1 Conclusion

1. JICA Study Team developed the Technical Specification of Water Supply System on the Santiago island with MTIE of GoCV, and no specific issue was found.

2. JICA Study Team conducted the preliminary Economics Analysis on the total F/S Project and separated projects of S1, S2, N1, and N2 based on the developed system specification.
   All cases except “S2” show healthy financial economics.

3. JICA Study Team proposed the Operation and Maintenance systems in the transition period and in the future, but those systems should be further discussed.

4. JICA Study Team conducted the Initial Environmental Examination, and no specific issue was found.

7-2 Way Forward

1. JICA Study Team will conduct the CAPEX and OPEX estimation for their project scope with MTIE of GoCV.

2. MTIE of GoCV will conduct the CAPEX and OPEX estimation for their project scope with JICA Study Team.

3. Draft Final Report will be developed through home office work in Japan and field work in Cape Verde with careful discussion among MITE, JICA, and JICA Study Team based on the Interim Report.

4. Draft Final Report will be prepared by the end of October.
   1) Its discussion will be held on November in Praia.
   2) Final Report will be developed by the end of this year.

5. The major contents of the (Draft) Final Report are as follows:
   1) CAPEX and OPEX estimation
   2) Project Economics Study
   3) Financing and funding in consideration of Japan’ ODA loan

Anexo 1-6

Minutes of Meeting (5th Steering Committee)

&

Discussion materials

MoM
OF
PROJECT STEERING COMMITTEE
ON
FEASIBILITY STUDY
FOR
WATER SUPPLY SYSTEM DEVELOPMENT PROJECT

DATE: November 26th,
PLACE: Praia, Cape Verde

1. The Government of the Republic of Cape Verde (GoCV), in cooperation with the Government of Japan, intends to develop a structuring and strategic water sector project on the island of Santiago, aiming both at improving the water supply conditions, through the interconnection of water transmission and distribution networks, and at strengthening the production capacities;
2. Given the specific and strategic significance of the project, a diligent and efficient technical follow-up will be needed for the same;
3. In the scope of implementation of the above mentioned project, there will be a need to guarantee, to the GoCV, reliable technical counsel and assistance;
4. It is much advisable that the project be followed up and supported by all sectors and institutions which are, in one or other way, related to the water sector.
5. In this purpose, a Project Steering Committee has been officially established on 26th of January 2010 by the DISPATCH No. 007 / 2010 issued by MEGC (now MTIE).
6. The Project Steering Committee has met officially for the fifth time on the 23rd of November 2010, in the office of Cape Verde Investment Agency, Praia. The list of participants is given in ANNEX-2.
7. During the Project Steering Committee, the JICA study team made a presentation regarding the Draft Final Report of the study as referred in ANNEX-1.
8. The Project Steering Committee members hereby confirmed full understanding of the Draft Final Report with main points discussed as per hereto the Attachment of the Minutes of Meeting.

Chairman of the Project Steering Committee

Mr. Abraão Andrade Lopes
MTIE / General Director for Energy (DGE)

MINUTES of MEETING
on
THE 5th STEERING COMMITTEE
for
THE PREPARATORY SURVEY
on
WATER SUPPLY SYSTEM DEVELOPMENT PROJECT
in
THE REPUBLIC OF CAPE VERDE

Praia, 26th November, 2010

Mr. Abraão Andrade Lopes
MTIE / General Director for Energy (DGE)
The Government of the Republic of Cape Verde

Mr. Mitsutoshi SUZUKI
Lead Consultant of the Survey Mission
Japan International Cooperation Agency

(as witness)
Mr. Takeharu KOJIMA
Global Environment Department
Japan International Cooperation Agency

Attachment

Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched a mission (hereinafter referred to as "the JICA Mission") to the Republic of Cape Verde. Since their arrival on November 18th, 2010, the JICA Mission and officials of Government of the Republic of Cape Verde (hereinafter referred to as "the GoCV"), Ministry of Tourism, Industry and Energy, (hereinafter referred to as "MTIE") had detailed discussions on the Draft Final Report of the Preparatory Survey (hereinafter referred to as "the Survey") for Water Supply System Development Project (hereinafter referred to as "the Project").

The discussions of the 5th Steering Committee is described below. The JICA Study Team will proceed as planned up to December 2010, when the Survey comes to the end.

1. Conditions of the Survey in general
   The JICA Mission stated that the results of discussions do not imply any decision or commitment by JICA for its prospective loan for the Project at this moment and the above results should be reported to the higher authority of JICA and the Government of Japan.

2. JICA Mission made a presentation regarding the Draft Final Report of the study using ANNEX-1 to all attendants listed in ANNEX-2.

3. After the presentation, all attendants made comment, discussion, and question as below:
   a. Project Implementation Time Schedule
      GoCV commented that the proposed time schedule should be shortened, because water supply issue was very serious, and the project was materialized and completed as soon as possible.
      JICA explained that the proposed time schedule in the F/S Report was only indicative, and was developed in consideration of typical Japan's ODA loan application.
      JICA commented that JICA should further discuss the time schedule with MTIE.
   b. RO permeated water quality specification
      GoCV asked the permeated water quality specification.
      JICA answered that 1st RO permeated was less than 0.9mg/l-Boron and 2nd RO permeated was less than 0.5mg/l-Boron, and the more detail specification was shown in Figure 4.1-5 and Figure 4.1-6 in the Draft Final Report.
   c. Drinking Water Sales Plan
      GoCV asked about 15% loss of production water and tariff in the Sales Plan.
      JICA replied that 15% loss consisted of leakage and non-revenue water, and the value of 15% was discussed and mutually agreed in the 3rd Steering Committee on June 2010.
      JICA also replied that the current water tariffs were referred as 5-10m^3/month consumption basis.
   d. Power Consumption of Desalination Facility
      GoCV commented that the consumption of 4.7kWh/m^3 seemed to be high and should be further decreased.
      JICA replied that this consumption was based on in-house performance data and 2 staged RO system.
      JICA additionally replied that the consumption might be further decreased through the detail design and based on the allowable Boron content in the drinking water.
   e. O&M Planning and ADA function
      GoCV (ADA) commented that
      1) In Praia only, ELECTRA is responsible for O&M of distribution network, and ADA is responsible for public taps,

2) In each municipality, SAAS is responsible for O&M of distribution network, public taps and house connections,
3) After the house connection is completed, the role of ADA in public taps may decrease,
4) Water production, transmission and distribution should be managed together.

f. STEP Loan
GoCV (MoF) commented that STEP Loan might result to the higher project cost.
JICA explained STEP as follows:
1) Cost of Japanese goods and services should be more than 30% of JICA loan portion in the STEP application,
2) Japanese goods and services in the desalination business field are globally competitive,
3) Interest rate of the STEP loan will be lower,
4) JICA conducts the detail design on grant basis,
5) Details of the above will be decided by Government of Japan.

g. Reservoir Location and Elevation
GoCV commented that JICA reservoirs should be located at the wherever possible high elevation for easy gravity flow to users.
JICA commented that the proposed locations were decided in consideration of gravity flow, technical and commercial aspects, and SAAS opinion who accompanied during the field survey.

h. Connection between JICA reservoir and user
GoCV commented about the demarcation of the connection between JICA reservoirs and users.
JICA replied that GoCV was responsible for the connection between JICA reservoirs and users.

4. Future Activities
JICA asked the followings to GoCV, and GoCV basically agreed;
a. GoCV will make comments on the Draft Final Report by 10th December in English writing.
b. According to the survey, GoCV will prepare to establish the appropriate O&M plan and organization.
c. According to the survey, GoCV will prepare the appropriate financial management plan.
d. GoCV will host the next (6th) Steering Committee next March or April.

GoCV commented that Task force team to conduct further considerations will be established, and officers of water related institutions will be assigned.

(End)

ANNEX-1: 5th Steering Committee Presentation
ANNEX-2: Attendants List of 5th Steering Committee

5th Steering Committee
on
Water Supply System
Development Project in Santiago, Cape Verde
(JICA-II Project)

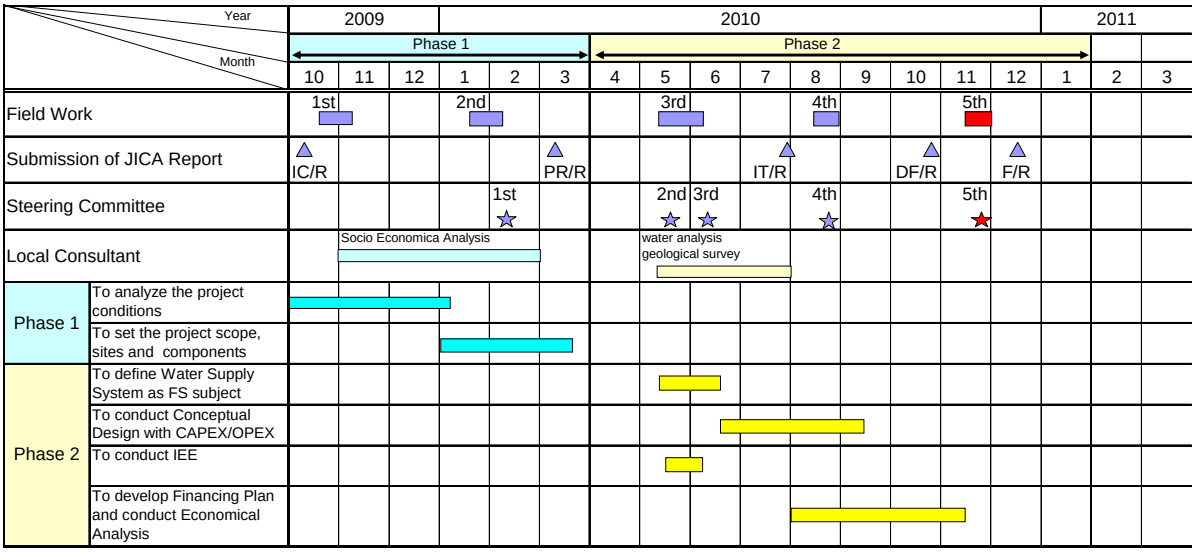
November 23, 2010 at Praia

Japan International Cooperation Agency

Toyo Engineering Corporation
UNICO International Corporation
Ingérosec Corporation

Contents

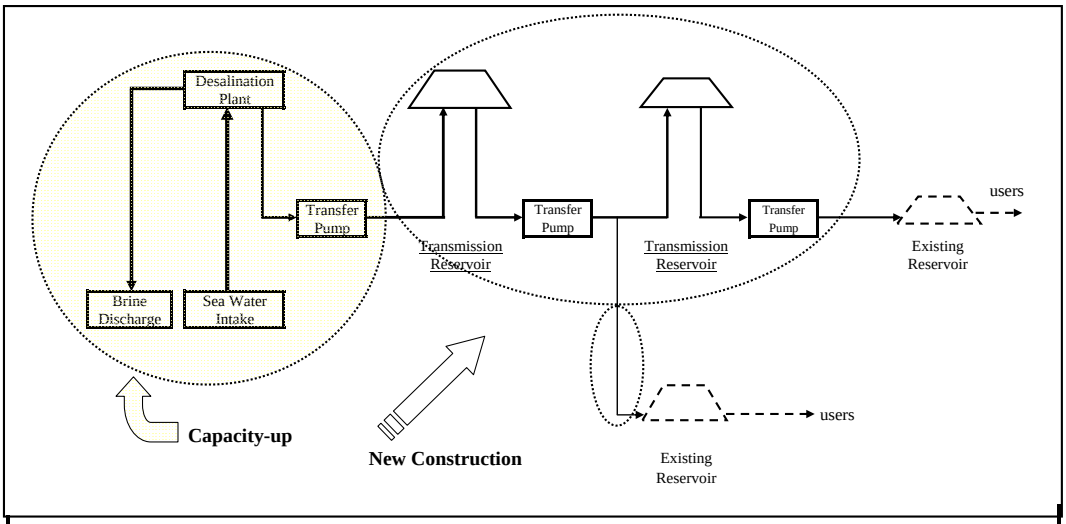
1-1 Implementation Schedule of JICA Study



IC/R: Inception Report
PR/R: Progress Report
IT/R: Interim Report
DF/R: Draft Final Report
F/R: Final Report

We are here.

1-2 Outline of F/S Project



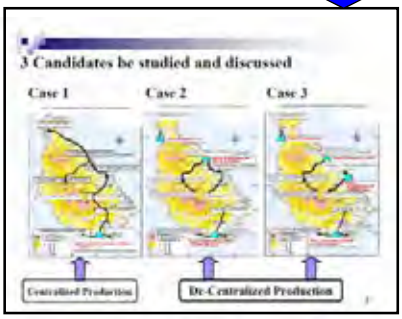
Water Supply Project

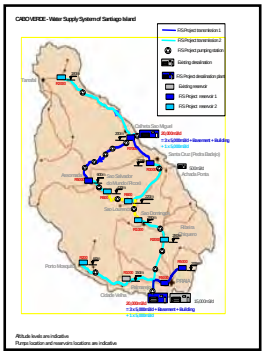
F/S Project by JICA
incl. Desalinations, Transmission Lines and Reservoirs

others by GoCV
incl. Distribution and House-connection

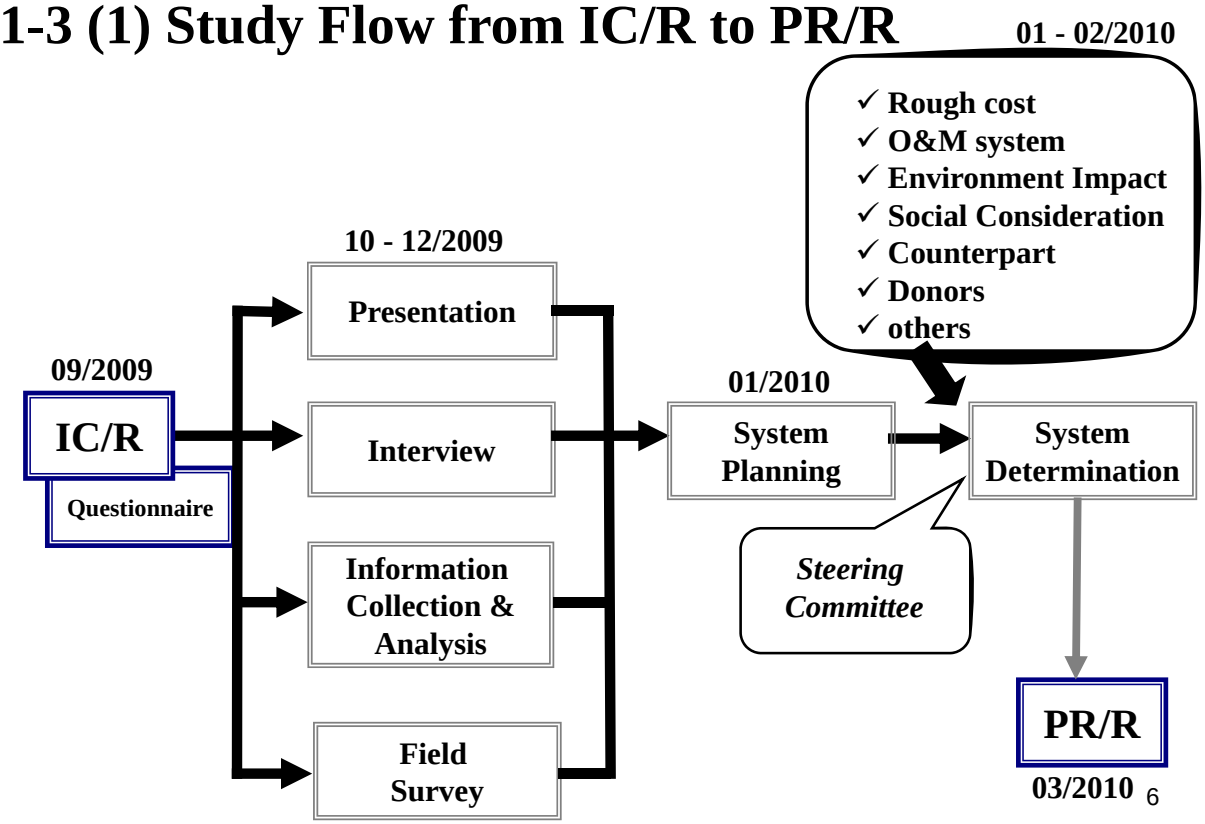
1-3 Each Report Topics

09/2009	03/2010	08/2010	11/2010	12/2010
IC/R	**PR/R**	**IT/R**	**DF/R**	***F/R***
- KOM - Methodology - Approach - Field Survey	- Horizon in 2020 - System Planning - Socio Analysis - donor projects - 3 candidates	- Basic Planning - GW Utilization - Boron content - Water Analysis - Soil Investigation - Technical Specification	- Cost Estimation - Economics - Funding - O&M - ODA loan	- *comments* - *modification* - *correction* - *finalized*

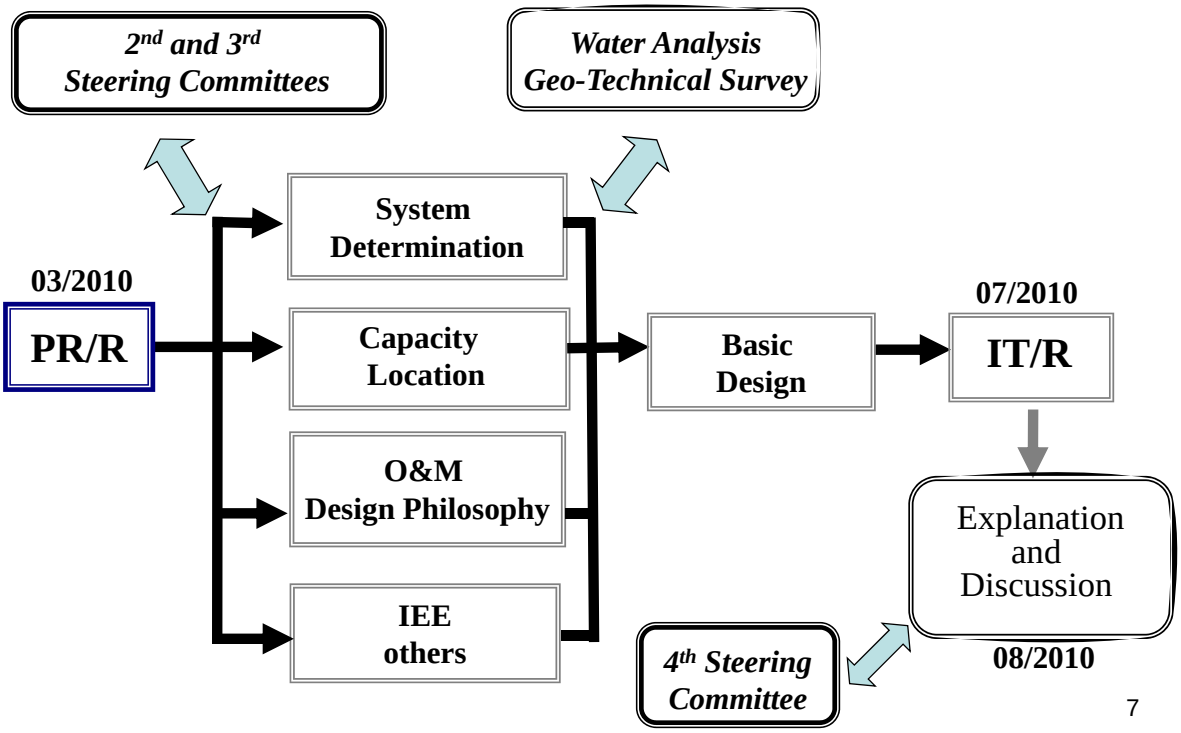




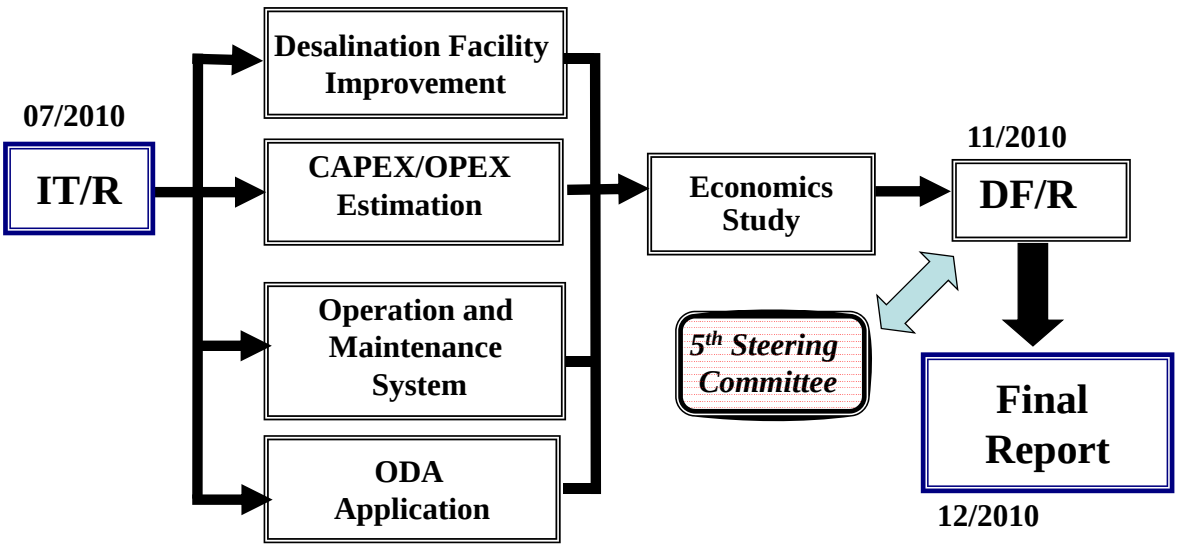
1-3 (1) Study Flow from IC/R to PR/R



1-3 (2) Study Flow from PR/R to IT/R



1-3 (3) Study Flow from IR/R to DF/R

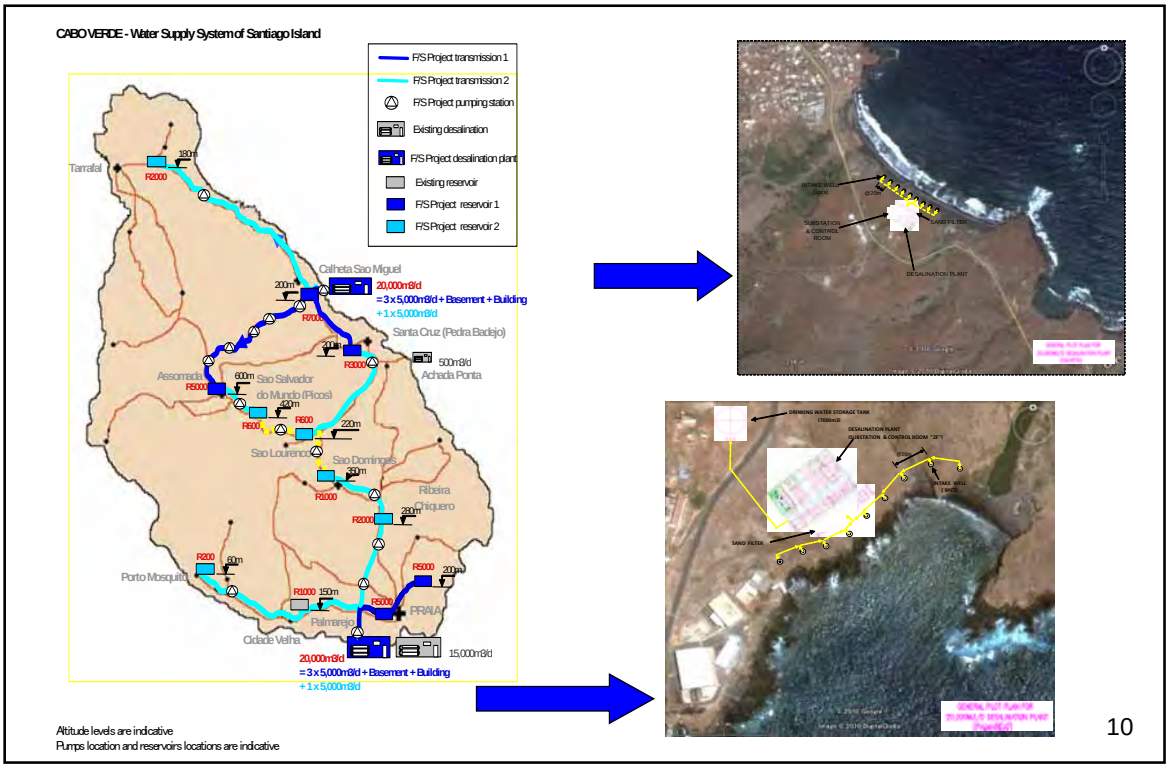


2.1 Capacity of Water Supply System

- **Drinking water demand in 2020:** **56,229m^3/day (round 55,000m^3/day)**
- **Existing Desalination Capacity in 2010:** **5,000m^3/day, in Praia**
- **Firmly Planned expansion plant:** **5,000m^3/day by Spain in Praia**
- **Firmly Planned plant:** **5,000m^3/day by WB in Praia**
- **Additional Capacity for whole demand:** **40,000m^3/day in island**
  (= 55,000 - 5,000 x 3units)

⇒ **Additional water production capacity of JICA F/S Project, Desalination Capacity is set as 40,000m^3/day.**

2-2 Sea Water Desalination Facility, *General Layout*



2-3 Sea Water Desalination Facility, *improvement*

To improve the performance, Energy Recovery Device (ERD) was studied to utilize high pressure brine water from RO unit as below:

Outline of Qualitative Comparison of Energy Recovery Device

Type	Turbine-based Centrifugal Energy Recovery Device		Isobaric Energy Recover Device	
	Turbo Charger	Pelton Turbine	PX (*1)	DWEER (*2)
Energy Recovery	50-65%	40-60%	Approx. 95%	Approx. 95%
Application	For smaller plant	For larger plant	Applicable to larger plant by multi-train	Applicable to larger plant
Experiences	Many	Many	Lately developed, increasing experiences	Lately developed, increasing experiences

(*1) PX: Pressure Exchange

(*2) DWEER: Dual Work Energy Exchanger

DWEER ERD type was applied from technical and commercial views.

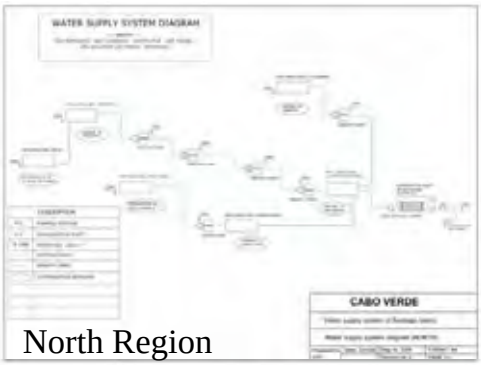
After DWEER ERD type application, Power Consumption of whole desalination plant was improved to be from **6.5 to 4.7kWh/m^3** of desalinated water.
Preliminary drawing is shown as below for reference only.

Courtesy informed by FLOWSERVE Company

Note: Current Operation in Palmarejo

Capacity m^3/day	***ERD Type***	***Power kW/m^3***
5,000	***Centrifugal***	***4.27***
1,200	***Pressure Exchange***	***2.60***

2-4 Water Transmission Facility, *on Santiago island*

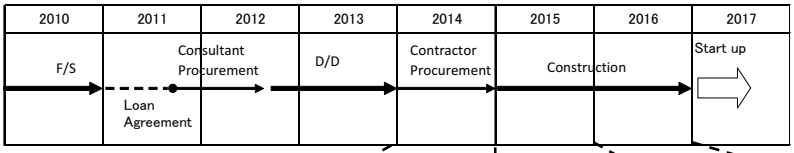


North Region

South Region

2-5 Implementation Planning

- No critical issue of the construction of the system is found.
- Due to the long transmission line construction, plural construction teams would be organized for the effective and reasonable planning.



DESCRIPTION		YEAR	Year 1											Year 2											Year 3										
		Calendar Mth	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
		Project Mth	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
GENERAL SCHEDULE		Construction Team No.	Contractor Procurement												Construction																							
North Area																																						
N1	Desalination Facility Construction and Installation																																					
	Water Transition Facility Construction	2 teams																																				
N2	Desalination Facility Installation																																					
	Water Transition Facility Construction	3 teams																																				
	Commissioning																									N1◆											N2◆
South Area																																						
S1	Desalination Facility Construction and Installation																																					
	Water Transition Facility Construction	1 team																																				
S2	Desalination Facility Installation																																					
	Water Transition Facility Construction	1 team																																				
	Commissioning																									S1◆											S2◆

3 CAPEX and OPEX Estimation *in-house basis*

3-1 (1) CAPEX Estimation of Sea Water Desalination Facility

1) Itemized equipment: Short specification basis, except 1st Stage Booster Pump and Energy Recovery Device
2) Bulk material: Similar facility ratio basis with Flow Sheet and layout
3) Civil and erection: Local vendor hearing similar facility basis with equipment list, Flow Sheet and layout
4) Instrumentation: Similar facility ratio basis with I/O numbers
5) Electrical work: Similar facility ratio basis with single line diagram, motor list and layout

3-1 (2) CAPEX Estimation of Water Transmission Facility

1) Pipe sections: Short specification basis of size, length and material
2) Pumping stations: Short specification basis of capacity and head
3) Reservoirs: Short specification basis of size and material

3 CAPEX and OPEX Estimation *in-house basis*

3-2 OPEX Estimation of System

OPEX was estimated based on the design and current commercial information.
OPEX consists of Variable Cost and Fixed Cost.

Variable Cost includes
- Utility Cost (Electricity)
- Membrane replacement
- Cartridge filter replacement
- Chemical cost for Sodium hypochlorite, Hydrochloric acid, Sodium bisulphite, Caustic soda, Calcium chloride and Sodium carbonate

Fixed Cost includes
- Personnel Cost
- Maintenance Cost
- Sales Expense and General Affair Cost

4 Project Economics Study

(1) Presuppositions

- Case “S1”, “S2”, “N1” and “N2” are studied … ref 4 (2)
- Production capacity, in “S1” case … ref 4 (5)
  - Production: 15,000m^3/d, with 365days/year operation
  - Sales : around 85% (13,500m^3/d) of production
- Project period
  - Construction : 2 years for EPC, including trial run
  - Project life for Economics analysis : 20 years
- Financial condition
  - Loan: 85% of F/S cost, 25years Yen loan from Japanese Government with 7 years exemption, 1.4% p.a. interest, remained part paid by equity.
  - Investment 60% at 1st year, 40% at 2nd year
- Project cost: as per slide … ref 4 (3) & (4)
- Tariff: 5.0USD/m^3 (395CVE/m^3) in 2020, in base case … ref 4 (5)
- Depreciation
  - Manner of depreciation : Straight-line method, with Zero salvage value
  - Service life : 20 years, for Economics study
- Unit cost for study
  - Electricity cost: 21CVE/kWh (= 0.265US$/kWh), based on ELECTRA tariff
  - Labor cost: 10,000 US$/person/year including overhead
  - Maintenance cost including membrane, chemical are considered accordingly

4 Project Economics Study

(2) Project Scope Case

Project Name	SWRO						Transmission and reservois	
	Location	Train capacity (m^3/d)	trains (unit)	Total quantity (m^3/d)	Civil work		Services Area	m^3/d
					Civil work, including equipment base	Building		
S1	Palmarejo	5,000	3	15,000	for all (4 trains)	for all (4 trains)	Praia	15,000
S2	Palmarejo	5,000	1	5,000	--	--	Ribeira Grande Sao Domingo	5,000
N1	Calheta	5,000	3	15,000	for all (4 trains)	for all (4 trains)	Sao Miguel Santa Catarina Santa Cruz	15,000
N2	Calheta	5,000	1	5,000	--	--	Tarrafal SS.Mundo Sao Laurenco	5,000
Total				40,000				40,000

Altitude levels are indicative
Pumps location and reservoirs locations are indicative

4 Project Economics Study

(3) FS Project Cost

Project Name	Service area	Project cost				
		(E) PC, Desalination	(E) PC, Transmission & Reservoir	(E) PC, Total	Other Project cost (Land, EIA, Consultant, Contingency, Training on desalination technology, etc) 30 % of (E) PC total cost	F/S Project Cost
		(million $)	(million $)	(million $)	(million $)	(million $)
S1	Praia	36.3	8.5	44.8	13.4	58.2
S2	Ribeira Grande Sao Domingos	5.5	10.6	16.1	4.8	20.9
S1+S2		*41.8*	*19.1*	*60.9*	*18.2*	*79.1*
N1	Sao Miguel Santa Catarina Santa Cruz	31.3	20.8	52.1	15.6	67.7
N2	Tarrafal SS Mundo Sao Laurenco	5.5	16.0	21.5	6.5	28.0
N1+N2		*36.8*	*36.8*	*73.6*	*22.1*	*95.7*
Total		78.6	55.9	134.5	40.3	174.8

note: "EPC" stands for "Engineering, Procurement, Construction"

Project cost is calculated by adding project implementation cost in future such as consultant fee, land acquisition fee, detail design fee etc. From in-house data, 30% of PC cost is added.

4 Project Economics Study

(4) Project Cost including GoCV cost

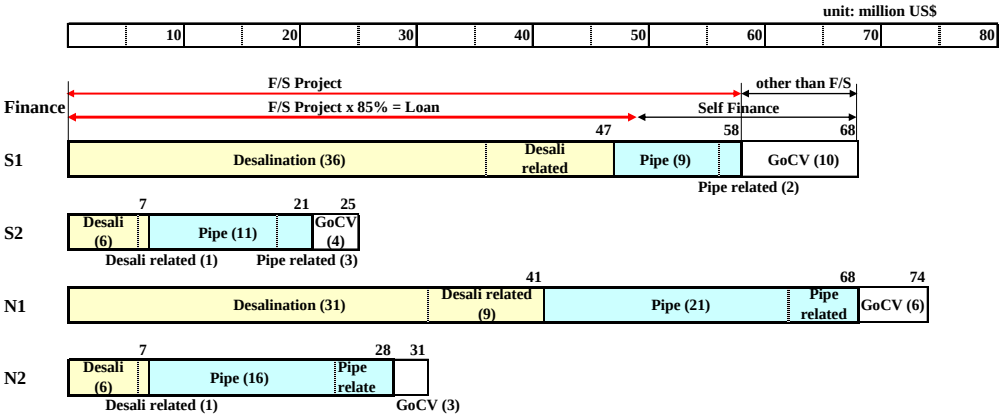
This cost is applied for CAPEX calculation

Project name		Project Cost						Production capacity		
		F/S Project =SWRO+Transmission+Other cost	by GoCV (Other than F/S project)				Total cost	F/S Project	by other fund (*note)	Total Production
			SWRO (*note)	Transmission pipe (in the past)	Distribution pipe (in future)	Sub Total				
Name	Service Area	million $	million $	million $	million $	million $	million $	m^3/d	m^3/d	m^3/d
by Others	*Praia*	-	*23*	*5*	-	*28*	*28*	-	*15,000*	*15,000*
S1	Praia	58	-	-	10	10	68	15,000	-	15,000
S2	Ribeira Grande Sao Domingo	21	-	-	4	4	25	5,000	-	5,000
N1	Sao Miguel Santa Catarina Santa Cruz	68	-	-	6	6	74	15,000	-	15,000
N2	Tarrafal SS.Mundo Sao Laurenco	28	-	-	3	3	31	5,000	-	5,000
F/S Projecct total		175	-	-	23	23	198	40,000	-	40,000
Total		175	23	5	23	51	226	40,000	*15,000*	55,000

(*note) The SWRO cost by others includes existing 5,000m3/d, and additional new 2 units of 5,000m3/d SWRO.
Data base : Interview result from GoCV etc.

4 Project Economics Study

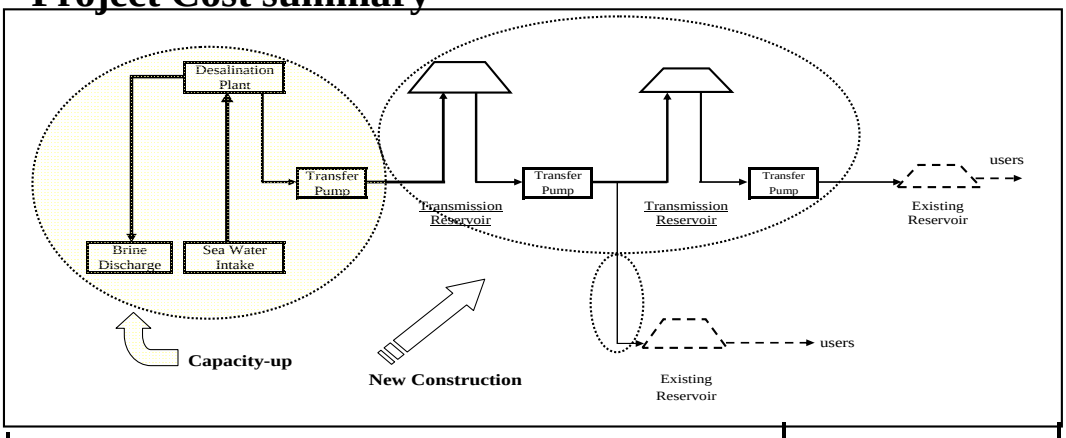
(4)' Project Cost distribution



Note:
Desali : Seawatert desalination plant
Pipe : Transmission pipe and reservoir
Desali related : Cost for additional development for desalination plant such as Land, EIA, Consultant for D/D, Training etc.
Pipe related : Cost for additional development for transmission pipe and reservoir such as Land, EIA, Consultant for D/D, Training, etc.
GoCV : Cost, prepared by Government of Cape Verde

4 Project Economics Study

(4)" Project Cost summary



F/S Project by JICA
incl. Desalinations, Transmission Lines and Reservoirs

others by GoCV
incl. Distribution and House-connection

US$ 175Million (JICA) + 23Million (GoCV) = 198 MillionUS$
CVE 13.8Billion (JICA) + 1.8Billion (GoCV) = 15.6 BillionCVE
as of 79.1CVE/US$

4 Project Economics Study

(5) Current Sales Price (Tariff)

Area		South					North									
Project name		S1	S2			South total	N1				N2				North total	Total
Municipality		Praia	Ribeira Grande	Sao Domingos	Average		Sao Miguel	Santa Catarina	Santa Cruz	Average	Tarrafal	SS do Mundo	Sao Lourenco	Average		
Tariff in 2008, consumption range of 6m3/month	*CVE.m3*	***333***	*354*	*280*	***309***	*331*	*280*	*120*	*280*	***198***	*134*	*310*	*150*	***175***	*192*	***279***
	US$/m3	***4.2***	*4.5*	*3.5*	*3.9*	*4.2*	*3.5*	*1.5*	*3.5*	*2.5*	*1.7*	*3.9*	*1.9*	*2.2*	*2.4*	*3.5*
Sales quantity in 2020 (m3/d)	Normal	26,987	1,033	1,600		29,620	2,266	6,490	3,987		3,015	1,098	1,015		17,871	47,491
	Peak	237	10	10		257	10	49	20		20	0	0		99	356
	Total	27,224	1,043	1,610		29,877	2,276	6,539	4,007		3,035	1,098	1,015		17,970	47,847
			2,653				12,822				5,148					
	Round Figure	**13,500**	**3,000**			(30,000)	**13,000**				**5,000**				(18,000)	**34,500**
	by Others	13,500														

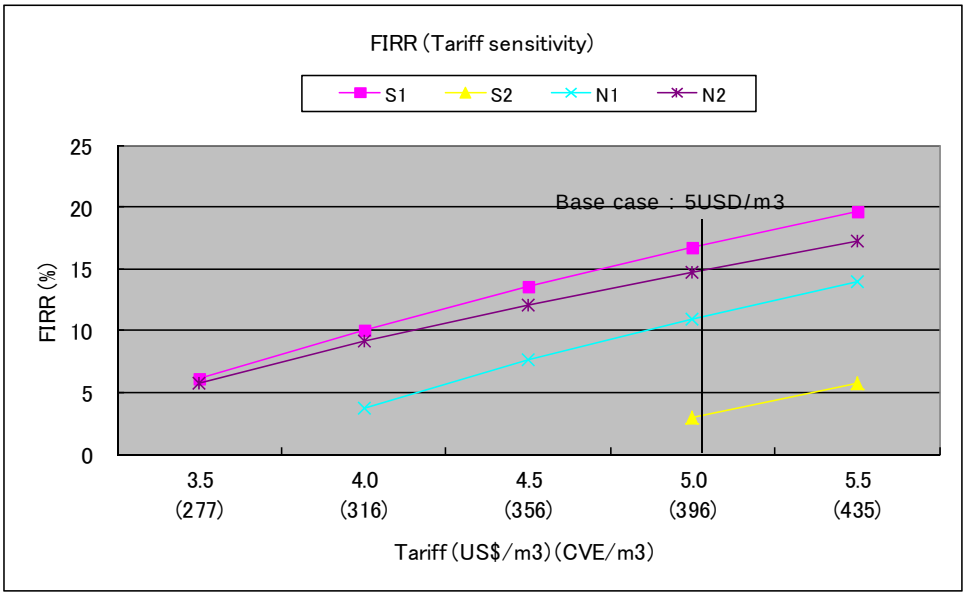
USD 1 = 79.1 CVE
Praia area 333 CVE/m3= 4.2 USD/m3
Other Praia 207 CVE/m3= 2.6 USD/m3

Data source: Electra for Praia, and SAAS for other municipality than Praia

Average tariff in other area than Praia is 207 CVE/m3. According to Social survey in 2009 by JICA study team, these area may accept tariff increase up to 200-350 CVE/m3 (=1.7 times max). Therefore 1.4 times of average tariff of 279 CVE/m3 (=3.5 US$/m3) (= 5US$/m) is set as base case in 2020.

4 Project Economics Study

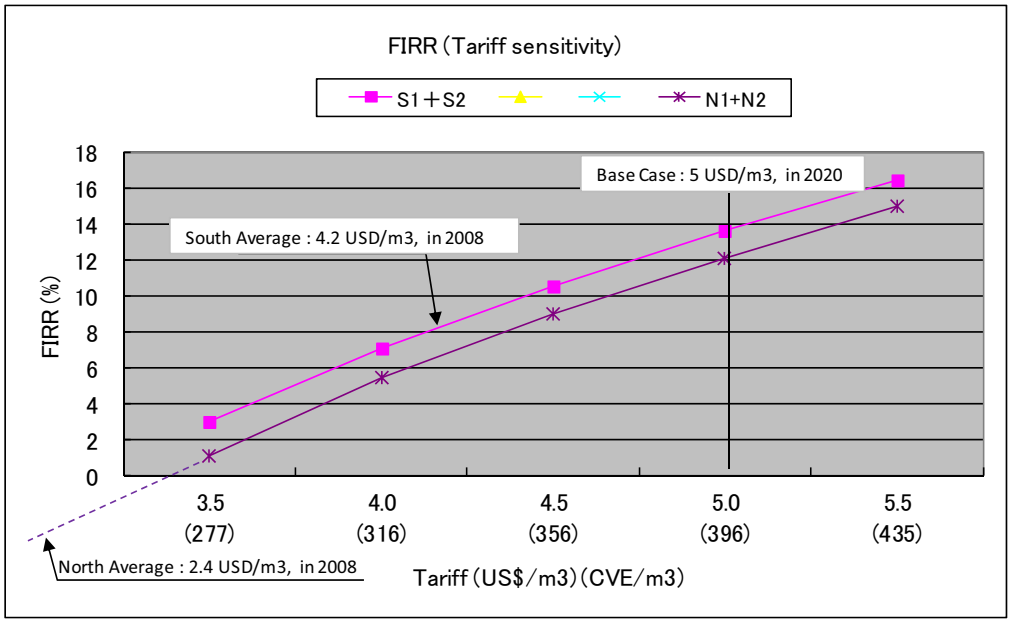
(6) Calculation Result F-IRR



5 US$/m3 is enough feasibility in all cases.

4 Project Economics Study

(6) Calculation Result F-IRR *-continued-*



4 Project Economics Study

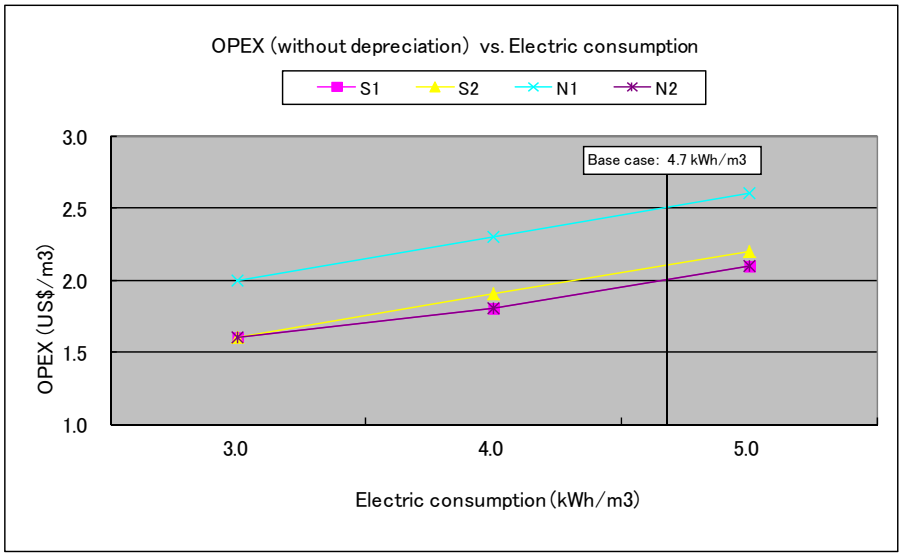
(7) Operation Cost

Project Name	Production capacity	Production						Sales, Admi'n	Total		Average Tariff, in 2008
		Electricity	RO membrane	Cartridge filter	Chemical	Manpower	Maintenannce material etc	Sales expense			
	m3/day	US$/year	US$/year	US$/year	US$/year	US$/year	US$/year	US$/year	US$/year	USD/m3	CVE/m3 (US$/m3)
S1	15,000	9,400,000	320,000	60,000	150,000	260,000	400,000	500,000	11,090,000	2.0	333 (4.2)
S2	5,000	3,100,000	110,000	20,000	50,000	20,000	350,000	100,000	3,750,000	2.1	309 (3.9)
S1+S2	*20,000*	*12,500,000*	*430,000*	*80,000*	*200,000*	*280,000*	*750,000*	*600,000*	*14,840,000*	*2.0*	*331 (4.2)*
N1	15,000	11,500,000	320,000	60,000	150,000	280,000	800,000	470,000	13,580,000	2.5	198 (2.5)
N2	5,000	2,800,000	110,000	20,000	50,000	20,000	500,000	180,000	3,680,000	2.0	175 (2.2)
N1+N2	*20,000*	*14,300,000*	*430,000*	*80,000*	*200,000*	*300,000*	*1,300,000*	*650,000*	*17,260,000*	*2.4*	*192 (2.4)*
Total	40,000	26,800,000	860,000	160,000	400,000	580,000	2,050,000	1,250,000	32,100,000	2.2	279 (3.5)

Note : Other cost than above items, such as depreciation, interest, tax etc is not included.

4 Project Economics Study

(8) Operation Cost vs. Power Consumption



Note: 1 kWh/m^3 consumption influences around 0.3US$/m^3 production cost.

5. Operation and Maintenance Planning

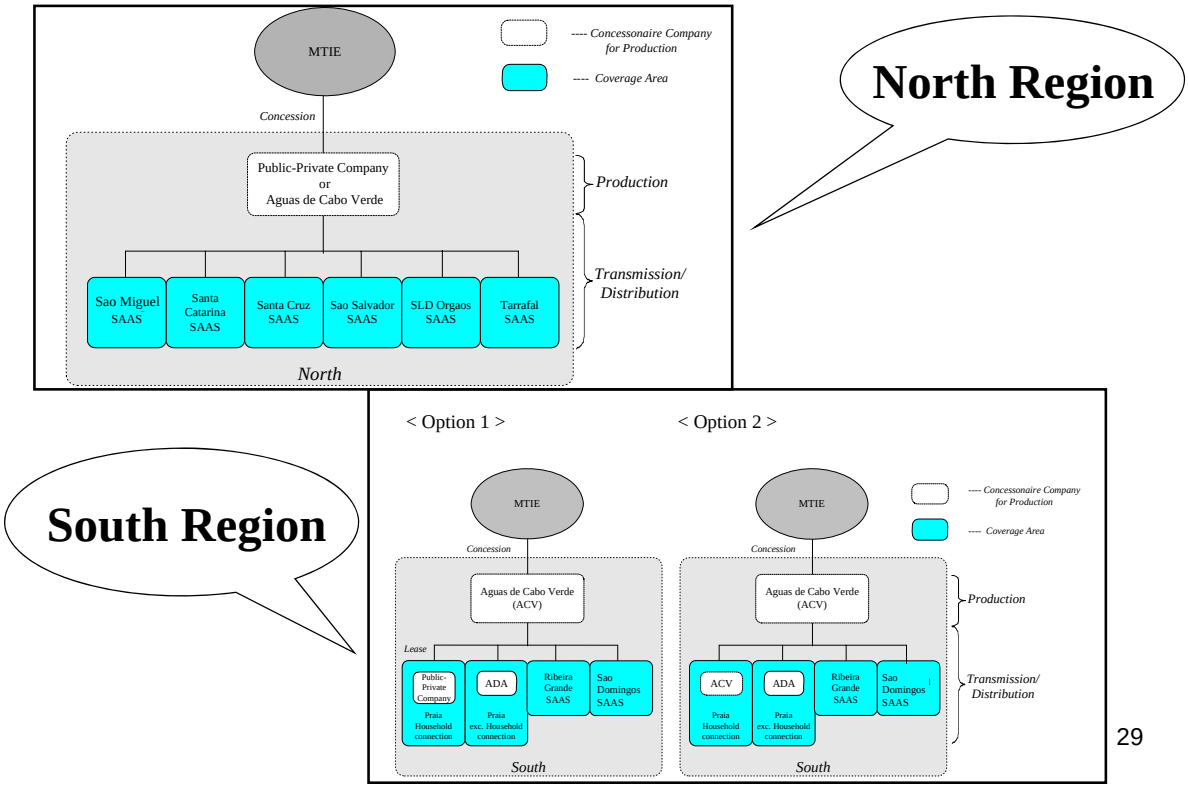
There is no organization which comprehensively manages and supervises waterworks and O&M at whole island level.

Considering the current waterworks situation and the project nature, the O&M systems in the transition period and in the future are recommended.

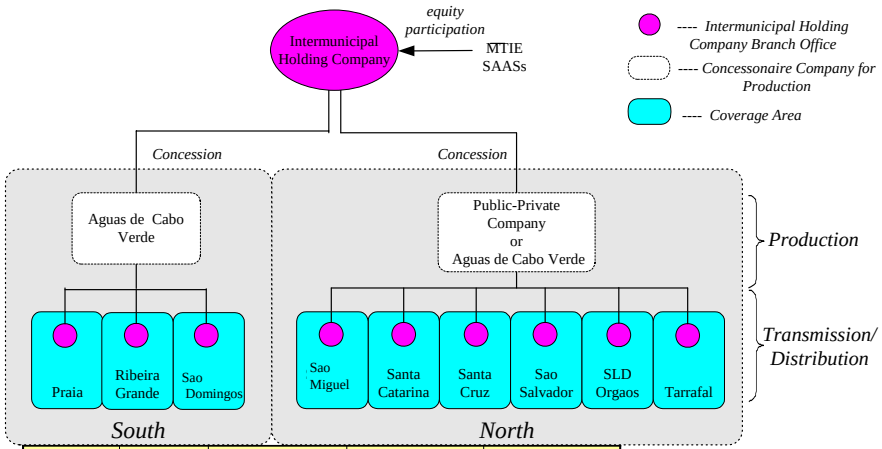
In the transition period, two water supply systems will be established in the south and the north in the island. The desalinated water produced by 2 desalination facilities in the southern and the northern regions will be transmitted and distributed to target municipalities.

As a future scenario, establishing an inter-municipal public holding company will manage and supervise the water supply system comprehensively in southern and northern regions.

5-1 O&M Planning in Transition Period



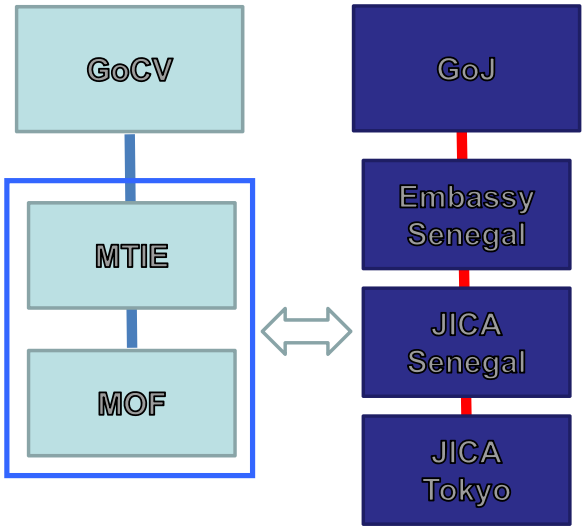
5-2 O&M Planning in Future



Region	*Ownership/ Role*	*Production*	*Transmission*	*Distribution*
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

6-1 Approach to Japan's ODA loan

- **Type of Applicable Loan:**
  - **"the Project loan"**
- **Terms and Conditions of Loans:**
  - **Interest Rates and Repayment Periods to be determined by the Government of Japan (GoJ)**
  - **Special Terms for Economic Partnership (STEP) is very interesting loan with Japan-Tied condition**



6-2 Sequence of Procedures (1/2)

(1) Project Identification by GoCV

The result of Survey consists of several potential elements of the project.

GoCV shall make an official decision for Project identification.

(2) Request submission by GoCV

After the approval of the JICA feasibility study,

GoCV will issues the request for Japan's ODA loan to be submitted through the Japanese Embassy in Senegal to GoJ.

6-2 Sequence of Procedures (2/2)

(3) Appraisal Mission by JICA

JICA's Appraisal Mission will be dispatched to Cape Verde.

After the Appraisal Mission, the GoJ will make decision and determination of loan amount and its terms of conditions.

After Prior Notification issued by the GoJ,

Exchange of Notes and Loan Agreement will be concluded.

7. Conclusion

(1) Horizon of Drinking Water Demand in 2020 is set, and F/S Project of 40,000m^3/day Sea Water Desalination Facility and its Drinking Water Transmission Facility is planned.

(2) Water Supply System Project is Technically, Environmentally and Financially feasible in Northern, Southern and entire island.

(3) JICA recommends that the following way forward should be conducted by the Government of Cape Verde;

1) to review (Draft) Final Report
2) to discuss Financing and Funding in consideration of Japan's ODA
3) to initiate Environmental Impact Assessment
4) to discuss and select Project priority

Anexo2

List of Received Document

(Development, Institutions, Environment)

LIST OF DOCUMENT: PART A, DOCUMENTS RELATED TO DEVELOPMENT PLAN

	No.	TITLE OF DOCUMENT	TYPE		CONTENTS
PHASE I	A1	Perfil de Pobreza em Cabo Verde (2001-2002, Instituto nacional de Estatistica/World Bank)	□COPY ■RECEIVED	□DATA □ PURCHASED	Study report on Poverty Ratio Profile.
	A2	Condicoes de Vida dos Agregados familiares (2001-2002, Instituto nacional de Estatistica/World Bank	□COPY ■RECEIVED	□DATA □ PURCHASED	Socioeconomically study on the livelyfood of the families.
	A3	Caracterristicas Socio-Demograficas (2001-2002, Instituto nacional de Estatistica/World Bank)	□COPY ■RECEIVED	□DATA □ PURCHASED	Socioeconomically study on the livelyfood of the families.
	A4	Rapport Final de l'Etude de faisabilite de l'Amelioration de l'Alimentation en Eau et de l'assainissement de la Commune de Santa Catarina (2009, Agence Francaise de Developpement:AFD)	□COPY ■RECEIVED	□DATA □ PURCHASED	F/S on the water supply and swerage development project in the municipality of Santa Catarina/Assomada.
	A5	Plan de situation - Eau potable - Calheta	■COPY □RECEIVED	□DATA □ PURCHASED	Location map of deep wells and reservoirs in the municipality of Sao Miguel
	A6	Memorandum do Atelier de Reflexao Sobre a Intermunicipalidade dos Servicos de Agua e Saneamento na Ilha de Santiago (September 2009, Agence Francaise de Developpement:AFD)	■COPY □RECEIVED	□DATA □ PURCHASED	Minutes of Workshop among Municipalities' SAASs in the Santiago island.
	A7	Unidade de desalinizacao e Aducao de Agua (2009, Municipality of Sao Domingos)	□COPY □RECEIVED	■DATA □ PURCHASED	Project summary report on new desalination plant in the municipality of Sao Domingos financed by Lux-Development.
	A8	Estatisticas E Projeccoes Do Turismo Em Cabo Verde	□COPY □RECEIVED	■DATA □ PURCHASED	Statistics about tourism until 2008
	A9	Plano Estrategico Para O Desenvolvimento Do Turismo Em Cabo Verde	□COPY □RECEIVED	■DATA □ PURCHASED	Development plan of tourism for 2010-2013
	A10	Estimativa orçamental	□COPY ■RECEIVED	□DATA □ PURCHASED	Unit prices relative to power related works
	A11	Lista de furos realizados no Municipio / Resarvatorios de stockagem de agua existentes no Municipio	□COPY ■RECEIVED	□DATA □ PURCHASED	List of wells and reservoirs in the municipality of Picos (San Salvador de Mundo)
	A12	no title	□COPY ■RECEIVED	□DATA □ PURCHASED	List of reservoirs in municipality of Pedro Badejo (Santa Cruz)
	A13	no title	□COPY ■RECEIVED	□DATA □ PURCHASED	List of reservoirs in municipality of Tarrafal

PHASE II	A14	Relacao Dos Reservatorios Para Agua Potavel Em Funcionamento	□COPY ■RECEIVED	□DATA □ PURCHASED	List of reservoirs in Municipality of Sao Lourenco dos Orgaos
	A15	No title	□COPY ■RECEIVED	□DATA □ PURCHASED	Drawings of Sao Domingos existing water facilities
	A16	COMUNICAR	□COPY ■RECEIVED	□DATA □ PURCHASED	News about Health Administration
	A17	No title	□COPY □RECEIVED	■DATA □ PURCHASED	Topographic maps of Santiago
	A18	No title	□COPY □RECEIVED	■DATA □ PURCHASED	Planimetric maps of Santiago
	A19	No title	□COPY □RECEIVED	■DATA □ PURCHASED	Geologic map of Santiago
	A20	The study for groundwater development for Santiago Island	□COPY □RECEIVED	■DATA □ PURCHASED	Study for groundwater development for Santiago Island
	A21	No title	□COPY □RECEIVED	■DATA □ PURCHASED	Distribution network of ELECTRA for S.Filipe, S.Vicente, Achadinha, Grande Tras, Lem Ferreira, Terra Branca, Bela Vista, Eugenio Li;a, Pensa;ento, Ribeirinha, Areia Branca, Lombo Veneno
	A22	Gabinete de Qualidade e Ambiente	□COPY ■RECEIVED	□DATA □ PURCHASED	Water quality at ELECTRA desalination plant of Palmarejo
	A23	Lista furos (INGRH)	□COPY □RECEIVED	■DATA □ PURCHASED	List of wells in Santiago with results of water quality analysis
	A24	Onde Estamos?	□COPY ■RECEIVED	□DATA □ PURCHASED	Touristic facilities in Cape Verde
	A25	RELECAO de reservatorios publicos de abastecimento de agua potavel no concelho de sao migue	□COPY ■RECEIVED	□DATA □ PURCHASED	List of water related infrastructures of Sao Miguel
	A26	PAGIRH	□COPY □RECEIVED	■DATA □ PURCHASED	National Action Plan for Integrated Water Resources Management: definition of water resources related policy in Cape Verde.

LIST OF DOCUMENT: PART B, DOCUMENTS RELATED TO INSTITUTIONS

	No.	TITLE OF DOCUMENT	TYPE		CONTENTS
PHASE I	B1	Relatorio de actividades e conta de 2008 (Camara Municipal do Tarrafal)	■COPY □RECEIVED	□DATA □ PURCHASED	Annual report 2008 and tarrif chart of the SAAS in the municipality of Tarrafal
	B2	Relatorio de Sintese das actividades Realizadas no de 2008 (Camara Municipal de Sao Lourenco dos Orgaos)	■COPY □RECEIVED	□DATA □ PURCHASED	Annual report 2008 of the SAAS in the municipality of Sao Lourenco dos Orgaos
	B3	Relatorio de actividades Referente ao Ano de 2003, 2004, 2005, 2006, 2007, 2008 (Camara Municipal de Santa Cruz)	■COPY □RECEIVED	□DATA □ PURCHASED	Annual report from 2003 to 2008 of the SAAS in the municipality of Santa Cruz.
	B4	Decreto-Lei No.36/2008	■COPY □RECEIVED	□DATA □ PURCHASED	Decree on concession, project, construction, financement, exploration, infrastructure and equipments of desalination plant of sea water in the municipalities in the Santiago island.
	B5	Decreto-Lei No.75/1999	■COPY □RECEIVED	□DATA □ PURCHASED	Decree on legal licence for concession of utilization of natural resources.
	B6	Contrato general de Concessao de Transporte e Distribuicao de Energia Electrica e Agua e de Recolha e Tratamanto de Aguas Residuais para Reutilizasao	■COPY □RECEIVED	□DATA □ PURCHASED	Concession contract between GoCV and ELECTRA on Electricity and Water Transmission and Distribution. General.
	B7	Decreto-Lei No.115/V/2007	■COPY □RECEIVED	□DATA □ PURCHASED	Authorization by GoCV for water related laws.
PHASE II	B8	Relatorio Estatistico 2008	□COPY ■RECEIVED	□DATA □ PURCHASED	Statistics about Health sector in Cape Verde, of the Ministry of Health of Cape Verde
	B9	ELECTRA Annual Report	□COPY □RECEIVED	■DATA □ PURCHASED	Annual Report of the power and desalination water producer and distributor from 2005 to 2008
	B10	Boletim Oficial	□COPY □RECEIVED	■DATA □ PURCHASED	Base of concession and agreement for independant water producer between Cape Verde governement and LACHESI company (CAIS)
	B11	Instrucao 02/2008	□COPY □RECEIVED	■DATA □ PURCHASED	Notice on the modalities of Agua de Porto Novo, office of water management
	B12	Contrato especifico de Concessao de Transporte e Distribuicao de Energia Electrica e Agua e de Recolha e Tratamanto de Aguas Residuais para Reutilizasao	□COPY □RECEIVED	■DATA □ PURCHASED	Concession contract between GoCV and ELECTRA on Electricity and Water Transmission and Distribution. Specific.
	B13	Boletim Oficial	□COPY □RECEIVED	■DATA □ PURCHASED	Law establishing the INGRH organisation.
	B14	SAAS Santa Catarina - Relatorio 2009	□COPY □RECEIVED	■DATA □ PURCHASED	Annual Report 2009 and management documents about the Water Service of Santa Catarina

	B15	SAAS Santa Cruz - Relatorio 2003-2008	□COPY ■RECEIVED	□DATA □ PURCHASED	Annual Reports 2005-2009 and managements documents about the Water Service of Santa Cruz
	B16	SAAS San Miguel - Relatorio 2008	□COPY ■RECEIVED	□DATA □ PURCHASED	Annual Report 2008 of the Water Service of San Miguel
	B17	Convention de Financement entre l'Union Européenne et Cap Vert	□COPY ■RECEIVED	□DATA □ PURCHASED	European Union Financing Agreement for Cape Verde
	B18	Resolução nº 19/2010 de 16 de Abril	□COPY ■RECEIVED	□DATA □ PURCHASED	Restrucuring procedure of creation of 2 operational companies for transmission and distribution of electricity
	B19	Lei No.115/V/99 de 13 de Dezembro	□COPY □RECEIVED	■DATA □ PURCHASED	Modified Water Code Law authorized by the Government on December 13, 1999

LIST OF DOCUMENT: PART C, DOCUMENTS RELATED TO ENVIRONMENT

	No.	TITLE OF DOCUMENT	TYPE		CONTENTS
PHASE I	C1	Environmental Assessment of Energy, Water and Sanitation Project (1998, World Bank)	□COPY □RECEIVED	■DATA □ PURCHASED	The main components of the project are rehabilitation and extension of water supply and sanitation systems in Praia and main urban centres (Assomada and Mindelo) plus institutional strengthening and support to SEMAP and INGRH.
	C2	Assessment of Environmental Impact of the Project "Santiago Iitegrated Energy Project" (2006, Direction General of Environment/AfDB)	□COPY □RECEIVED	■DATA □ PURCHASED	The Project envisages the extension of the Palmarejo Thermal Power Plant, the construction of sub-stations, as well as of the transmission and distribution lines
	C3	Boa Vista Wind Farm Project (2008, EXECUTIVE SUMMARY)	□COPY □RECEIVED	■DATA □ PURCHASED	Boa Vista Vigia wind farm project which has an installed capacity of 4MW and is located on the northwestern tip of the island.
	C4	ESTUDO DE IMPACTE AMBIENTAL BARRAGEM DE POILÃO (2005, MINISTERIO DO AMBIENTE, AGRICULTURA E PESCAS)	□COPY □RECEIVED	■DATA □ PURCHASED	Environment assessment on the Poilao Dam construction project financed by china.
	C5	Decreto-Lei No.3/2007	■COPY □RECEIVED	□DATA □ PURCHASED	Decree on expropriate, land acquisition.
PHASE II	C6	Boletim Oficial	□COPY □RECEIVED	■DATA □ PURCHASED	Environment laws of Cape Verde
	C7	Primeira Lista Vermelha de Cabo Verde	□COPY □RECEIVED	■DATA □ PURCHASED	List of Endangered Species of Cape Verde
	C8	Lei n44/6/2004	□COPY □RECEIVED	■DATA □ PURCHASED	Law for coastal environment protection
	C9	Plano de Gestao - Parque Natural do Fogo	□COPY □RECEIVED	■DATA □ PURCHASED	Fogo Natural Park - Management Plan
	C10	Plano de Gestao - Parque Natural do Monte Gordo	□COPY □RECEIVED	■DATA □ PURCHASED	Monte Gordo Natural Park (San Nicolau) - Management Plan
	C11	Plano de Gestao - Parque Natural do Serra Malagueta	□COPY □RECEIVED	■DATA □ PURCHASED	Serra Malagueta Natural Park (Santiago) - Management Plan

Anexo 3

Questionnaire

November 16, 2009

Additional Questionnaire for the JICA Survey on Water Supply System Development Project

A. General Information about Water Sector

Questionnaire	Answer from MEGC on Nov. 03, 2009
1. Organization for Water Sector	
1-1; (To MEEC) Organization, role of each department and section, and No. of staff.	Refer to URL: www.governo.cv/
1-2; (To ELECTRA) Organization, role of each department and section, and No. of staff. No. of staff for Operation and Maintenance of water supply facilities.	→To be provided.
1-3; (To SAAS) Organization, role of each department and section, and No. of staff. No. of staff for Operation and Maintenance of water supply facilities.	→To be provided.
2. Organizations for Japanese ODA Loan Project	
2-1; Primary Organization, name and role for loan agreement Bank and other organization as borrower Government guarantee application	Typical will be extracted from the Existing JBIC Loan Agreement for a project.
2-2; Project organization of Cape Verde side for new water supply system	Not available for the moment, Steering Committee should discuss.
2-3; Construction organization of Cape Verde side for new water supply system	Not available for the moment, Steering Committee should discuss.
2-4; Operation and maintenance organization of Cape Verde side for new water supply system	Not available for the moment, Steering Committee should discuss.
2-5; Relending mechanism from the central government Entity which will bear the foreign exchange risk Entity which will propose the terms and conditions of relending	Not available for the moment, Steering Committee should discuss.

3. Financial / Budgetary situation on Water Sector	
3-1; ・ Fiscal year start from the month of X and close Y? ・ Deadline of budget application from each ministry/ municipality according to the procedure of fiscal year? ・ Which ministry/agency is the responsible to approve the plan/program on water sector, especially the project financed by the international donors? ・ Which ministry/agency is the responsible to approve and allocate the annual budget to each ministry/ municipality? ・ Detailed procedure to apply the budget of new project from each executing agency such as CNAG, INGRH, ELECTRA, etc, to the Government? Financial situation of the Government, e.g. audit report, law of finance (version of fiscal year 2009 and latest 5 years), etc.	from January to December Description will be prepared
3-2; ・Annual budget to relevant agencies concerned with water sector such as CNAG INGRH, ELECTRA, each municipality's SAAS, etc. including the construction cost, personnel cost, operation & maintenance cost, etc.	MEGC will try to get →Partly provided.
3-3; ・Functions/roles on Project formulation and financial arrangement of those agencies concerned with water sector as below: - Ministry of Economy (MoE) - CNAG - INGRH - ELECTRA - ADA - SAAS	MEGC will try to get →Already interviewed.

- MADRRM - INERF - ARE	
3-4; Information on budget/amount to on-going projects financed by international donors in water sector according to the latest law of finance approved by GoCV including the composition of budget such as budget financed by GoCV and by international donors.	Information from Ministry of Finance as of 17/09/2009 was disclosed as reference.
4. Financial / Budgetary situation of ELECTRA	
Information on financial situation and annual cash flow such as - Annual budget from GoCV to ELECTRA (at least latest 5 years) - Annual revenue from water fee, etc. - Annual expense to personnel cost, operation & maintenance cost of water facilities, etc.	About 74 million EURO of 2015 for both water and power. Annual report of ELECTRA (latest 5 years) should be provided. →To be provided.
5. Information on On-going and Planned Water Supply Project in Santiago Island	
5-1; Projects financed by the GoCV	To be identified. →To be provided.
5-2; Projects financed by other donors	Detail description shall be required regarding project name, target areas, implementation schedule, project cost, budget from GoCV, budget from donors, etc. →To be interviewed.
5-3; Opportunity of Desalination projects other than Praia city	Yes. Desalination for Assomada from S. Cruz and S. Miguel Detail description shall be required regarding project name, target areas, implementation schedule, project cost, budget from GoCV, budget from donors, etc. Related report should be provided. →To be provided.

5-4; If yes on 5-3, who are projects implementation organizations?	
6. Water Tariff	
6-1; (To ARE) Current water tariff tables of SAAS in Santiago island and ELECTRA, determined by ARE	MEGC will try to get →Received.
6-2; (To ARE) Procedure and principle for setting water tariff Concerns or issues for resident's affordability to pay	MEGC will try to get →To be interviewed.
6-3; Collection system of water tariff	MEGC will try to get →Received.
6-4; Subsidy system on rural water supply	MEGC will try to get →To be interviewed.
6-5; House / individual connection fee	MEGC will try to get →To be interviewed.
6-6; Loss of water without water tariff collection	MEGC will try to get →To be interviewed.
7. Operation and Maintenance (O&M) of Water Supply Facilities	
7-1; (To ELECTRA, SAAS) Experienced major problems on O&M of water supply facilities	Lack of budget →Already interviewed.
7-2; (To ELECTRA, SAAS) What do you think of the causes and necessary actions?	Plumber training is necessary. WB assistance to each SAAS is planned →Already interviewed.
7-3; (To ELECTRA, SAAS) What kind of training is necessary for capacity development of your staff? Necessary training area and subject	Any training from Austria, France, WB, Germany →Already interviewed.
7-4; (To INGRH) Current major problems on O&M of water supply facilities, operated by ELECTRA and SAAS	→Already interviewed.

7-5; (To INGRH) What kind of technical supports INGRH provide to SAAS in the past?	→To be interviewed.
7-6; (To INGRH) What kind of training on O&M of water supply facilities does INGRH conduct for SAAS staff?	→To be interviewed.
8. Others	
According to JICA Preparatory Study on March 2009, a new PAGIRH mentioned about a necessity of new law/ institutional system on water sector. Please describe what kind of law/institutional system is developed?	Related documents should be provided. →Already interviewed.

B. Technical Information about Water Facilities

Questionnaire	Answer
1. Water Quality	
1-1; Regulations on water quality of drinking water	Draft on 2004 was received →Received.
1-2; Specification of drinking water	WHO generally applied
2. Procurement	
2-1; Availability of facility construction materials including cement, sand, gravel, steel structure, pipe and fitting, cable, wire, pump, motor, instrument, drum, tank, RO module, etc.	Only gravel, rock and stone are available →To be provided.
2-2; Availability of spare parts of facility	Not available
3. Construction	
3-1; Work Unit Price of - civil - construction - piping - welding - electrical cable - instrumentation - others	MEGC will try to get from Ministry of Infrastructure →To be provided.

4. Existing Water Supply System	
4-1: Network System - Specification and actual performance - Operation and maintenance system - Experienced major troubles - Major corrective and preventive maintenance issues - Maps indicating location of existing main reservoirs and their capacity (except for Santa Cruz): Note: Information on Santa Cruz was already provided.	Limited information was prepared and submitted →Partly provided (To see **E**, **F**, **G**).
4-2 Raw Water source	
- Sea water intake point, where? - Ground water intake points, where?	5000m3/d SWRO in Praia: Direct intake from creek 1200m3/d SWRO in Praia: sea water pumped from well near creek 500m3/d SWRO in S. Cruz: blackish water pumped from well near sea →Already interviewed.
4-3 Desalination Plant - Specification and actual performance - Operation and maintenance system - How Sea water resource imported? - How brine water discharge system? - Experienced major troubles? - Major corrective and preventive maintenance?	See each site visit memorandum →To be provided.
4-4 Water specification Desalinated water? Sea water? Well water?	Refer to sub-Contact report from INGRH →To be provided.

4-5 Soil or ground information Boring for N value, Ground water level, and Soil Composition and Soil corrosivity	MEGC try to get information on Praia desalination site →To be provided.

C. Socioeconomically Information

Questionnaire	Answer
1. Water tariff system	
1-1; Procedure of new tariff determination - Which agency is the responsible to determine the new price of water tariff and please describe detailed procedure?	→Already interviewed.
2. Water tariff collection	
2-1; Which agency is the responsibleto decide the utilization of the revenue from water tariff?	→Already interviewed.
3. Power Tariff and Consumption	
3-1; Power supply system in Santiago Island - Existing and planned supply system - Composition and characteristics of power tariff - Power tariff table - cost for new connection from grid to industrial facility	<from ELECTRA> →To be provided.

D. Natural and Environmental Information

Questionnaire	Answer
1. Environmental Assessment	
1-1; Necessary procedure of Environmental Impact Assessment (EIA) for water supply system project referring to the following points: ・ Who is responsible to conduct the EIA study? ・ Who is responsible to approve the EIA report? Time schedule of EIA	・ MEGC is responsible to conduct EIA study, ・ EIA study is necessary for MEGC to approve and proceed the project, ・ DGE is responsible to approve EIA report in relation with MEGC, and ・ It takes 4 months to approve EIA report by GoCV. Consultant companies that will be able to conduct EIA study are available in Cape Verde →Already Interviewed.
1-2; JICA will conduct Initial Environment Evaluation (IEE) level study for the project according to JBIC guideline and local relevant law in Cape Verde. Based on the above stage, how do you assess adequate study level as IEE? Note: JBIC guideline is separately attached for reference.	The procedure of EIA and necessary items to be studied is provided in *declare No.29/2006* →Already Interviewed.
2. Resettlement	
2-1; Necessary procedure of resettlement for the project referring to the following points: ・ Who is responsible to proceed resettlement? ・ Who is responsible to compensate the residents suffered from the project? How does the GoCV compensate the residents for their propertie? How does the GoCV compensate the residents for their income if the residents lose their income resources?	・ MEGC is responsible to proceed Resettlement and Land Acquisition, ・ Project affected people and properties are identified by MEGC and compensated by Ministry of Finance ・ Related decree, *declare No.3/2007,* has been provided. MEGC proceeds MEGC compensates using MoF budget →Already Interviewed.

3. Land Acquisition	
3-1; Necessary procedure of land acquisition for the project referring to the following points.	See above
・ Who is responsible to proceed land acquisition?	MEGC proceeds
・ Who is responsible to compensate the residents suffered from the project?	MEGC compensates using MoF budget
・ How does the GoCV compensate the residents for their land?	
・ How does the GoCV estimate the land price?	Subject to negotiation →Already Interviewed.

E. List of required documents

Following documents are required to implement the Study and please provide them to the Study Team at the first meeting of the Study.

Name of document	Objective of utilization
1. National Development Plan 2006-2011	Version 2004-2007 and 2008-2011 have been provided
2. Visao Nacional sobre a Agua, a Vida e o Ambiente No horizonte 2025	MEGC will check
3. Plano de Accao e Gestao Integrada dos Recursos Hidricos (PAGIRH)	MEGC will try to get →Received
4. Strategie Developpement a L'Horizon 2015 & Plan D'Action 2005-2008	MEGC will try to get
5. National program to Fight Poverty 1996-2005	MEGC will try to get →Received
6. Reports concerning about water resource and socioeconomically survey in basin of sao Miguel, Tarrafal, Salto **Direccao General da Agricultura, Silvicultura e Pecuaria (DGASP) , 2006**	MEGC will try to get →Not Necessary
7. Reports concerning about Water Sector Development 2011-2016 prepared by Lux-Development Agency	Required document has been identified. See No.3 of "**Additional list of required documents"** MEGC will try to get →Received
8. Reports concerning about National Census (last version) **Instituto National de EstaEistica**	MEGC will try to get, 2020 forecast in particular →Received
9. Reports concerning about Geological, Hydrographical and Meteorological (last 10 years) data of Santiago island **Instituto National de EstaEistica**	MEGC will try to get →Received

10. Documents, Low, Byelaw and declarations concerning about Environment Impact Assessment to proceed the project regarding water sector	Related decrees, *Decreto-Lei No.29/2006*, have been provided. If possible, digital formatted file, from MS-Word to PDF but any photocopy and scanning data, is also needed to be provided in order to translate directly from Portuguese to English on software for translation. →Received
11. Documents, Low, Byelaw and declarations concerning about Resettlement and Land Acquisition to proceed the public works	Related decrees, *Decreto-Lei No.3/2007*, have been provided. If possible, digital formatted file, from MS-Word to PDF but any photocopy and scanning data, is also needed to be provided in order to translate directly from Portuguese to English on software for translation. →Received
12. Documents concerning about Natural Park in Santiago island and Regulations applied to public works in Natural Park	MEGC will try to get Required document has been identified. See No.5 of "**Additional list of required documents"** →Received
13. Audit Reports (last 5 years) of ELECTRA and SAAS (Sao Miguel, Tarrafal, Assomada, etc)	Certain municipalities has provided few part of latest 5 years. From No.6 to No.14 of "**Additional list of required documents"** have not been provided. Shibata received 3D CAD. →Partly received

14. Please provide with the following Law/By-law on Water Sector. - Decreto-Lei no 115/V/99, de 13 de Dezembro - Decreto-Lei no 75/99, de 13 de Dezembro - DecretoLei no 168/87 de 31 de Dezembro	*Decreto-Lei no 115/V/99* and *Decreto-Lei no 75/99* have been provided. *DecretoLei no 168/87* will be provided. →Received If possible, digital formatted file, from MS-Word to PDF but any photocopy and scanning data, is also needed to be provided in order to translate directly from Portuguese to English on software for translation. →Received
15. Governmental decree/ regulation/ guideline on setting water tariff	MEGC will try to check and get if available →Interviewed
16. (To ELECTRA, SAAS) The latest Business Plan, Annual report	Certain municipalities has provided few part of latest 5 years. From No.6 to No.14 of "**Additional list of required documents"** have not been provided. →To be provided

F. Additional list of required documents (Before 2nd Mission)

Following documents have not been provided or additionally identified through the 1st mission and please add them to the "**List of required documents"**.

Name of document	Version	To be provided from
1. National census data of population in each municipalities	2008 and latest 10 years	MEGC Instituto National de Estat Eistica →Received.
2. Reports concerning about water resource and socioeconomically survey in basin of Sao Miguel, Tarrafal, Salto	2006	Direction General da Agricultura, Silvicultura e Pecuaria (DGASP) →Not Necessary.
3. Reports concerning about Water Sector Development 2011-2016 prepared by Lux-Development Agency (Etude faisabilité économique pour production et amélioration en eau menbre d'Associacion Santiago ???)		INGRH If possible, digital formatted file, from MS-Word to PDF but any photocopy and scanning data, is also needed to be provided in order to translate directly from Portuguese to English on software for translation. →Received.
4. Reports concerning about Geological, Hydrographical and Meteorological data of Santiago island	Last 10 years	Instituto National de Meteologia de Geofisica →Received.
5. Serra Malagueta protection management plan	Latest	Direction General of Environment If possible, digital formatted file, from MS-Word to PDF but any photocopy and scanning data, is also needed to be provided in order to translate directly from Portuguese to English on software for translation. →Received.
6. Annual Reports of ELECTRA	2004, 2005, 2006, 2007, 2008	ELECTRA →Received.

7. Annual Reports of the ADA in the municipality of Praia.	2004, 2005, 2006, 2007, 2008	Camara Municipal do Praia →To be provided form Ms. Miliam.
8. Annual Reports of the SAAS in the municipality of Tarrafal.	2004, 2005, 2006, 2007	Camara Municipal do Tarrafal →Received.
9. Annual Reports of the SAAS in the municipality of Sao Miguel. Staff information	2004, 2005, 2006, 2007, 2008	Camara Municipal do Sao Miguel →To be provided form Ms. Miliam.
10. Annual Reports of the SAAS in the municipality of Sao Domingos.	2004, 2005, 2006, 2007, 2008	Camara Municipal do Sao Domingos →Received.
11. Annual Reports of the SAAS in the municipality of Sao Lourenco dos Orgaos.	2004, 2005, 2006, 2007	Camara Municipal do Sao Lourenco dos Orgaos →Received.
12. Annual Reports of the SAAS in the municipality of Ribeira Grande. Copy of Contract with INGRH	2004, 2005, 2006, 2007, 2008	Camara Municipal do Ribeira Grande de Santiago →To be provided form Ms. Miliam.
13. Annual Reports of the SAAS in the municipality of Santa Catarina.	2004, 2005, 2006, 2007, 2008	Camara Municipal do Santa Catarina →Received.
14. Annual Reports of the SAAS in the municipality of Sao Salvador do Mundo.	2004, 2005, 2006, 2007, 2008	Camara Municipal do Sao Salvador do Mundo →Received.
15. Organization Chart of INGRH	Latest	INGRH →Received.
16. Organization Chart of ELECTRA	Latest	ELECTRA →Received.
17. Organization Chart of Ministry of Economy, Growth and Competitiveness (MEGC)	Latest	MEGC →Received.

18. Organization Chart of Ministry of Environment, Agriculture, Rural Development and Maritime Resources (MADRRM),	Latest	MADRRM →To be confirmed.
19. Decreto-Lei no 8/2004, de 23 de Fevereiro	2004 (final)	MEGC or INGRH If possible, digital formatted file, from MS-Word to PDF but any photocopy and scanning data, is also needed to be provided in order to translate directly from Portuguese to English on software for translation. →Received.
20. Despacho ARE no 01/07 de 13 de Janeiro	2007	ARE If possible, digital formatted file, from MS-Word to PDF but any photocopy and scanning data, is also needed to be provided in order to translate directly from Portuguese to English on software for translation. →Received.

Remarks: If possible, digital formatted file, from MS-Word to PDF but any photocopy and scanning data, are also needed to be provided, because it is much more helpful to us to translate directly from Portuguese to English on software for translation.

G. Additional list of required documents (During 2nd Mission)

Name of document	Version	To be provided from
1. Activity (Annual) Report of ARE	2008 and latest 5 years	ARE →To be provided form Ms. Miliam.
2. CAIS F/S Report, Technical Study Report		MEGC (Mr. Daniel) →To be provided form Ms. Miliam.
3. Financial Statement/ Break down of O&M cost of ELECTRA		ELECTRA (Mr.Pina) →To be provided form Ms. Miliam.
4. Localization map of reservoirs for Tarrafal		Austrian Cooperation -> Association of Municipalities? →To be provided form Ms. Miliam.
5. Localization map of reservoirs		San Lorenzo →To be provided form Ms. Miliam.
6. Reservoir list for potable water + localization map		SAAS San Miguel (to be sent to ONO's email address) →To be provided form Ms. Miliam.
7. Reservoir list for potable water + localization map		San Salvador do Mundo (Director) →To be provided form Ms. Miliam.
8. Reservoir list for potable water + localization map		Ribeira Grande →To be provided form Ms. Miliam.