Anexo1-2

Minutes of Meeting (1st Steering Committee)

&

Discussion materials

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

DATE: Februar 08, 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.
6. The Project Steering Committee has met for the first time on the 8th of February 2010, in the office of Ministry of Finance, Praia, Cape Verde. The list of participants is given in Appendix 1.
7. The main points discussed are based on the presentation by The JICA study team of all results and propositions related to the project at the time of the meeting. This presentation is given in Appendix-2.
8. The Project Steering Committee members hereby confirmed full understanding of main points discussed as per Appendix 3.

Chairman of the Project Steering Committee

Mr. Abraão Andrade Lopes
MEGC / General Director of Energy (DGE)

Appendix-3

MAIN POINTS DISCUSSED

Overall

1. According to the minutes of the meeting dated 23rd, October 2009 between the GoCV and the JICA Mission, a Project Steering Committee (hereinafter referred to as "the Committee") has been established on 26th of January 2010.
2. The function of Project Steering Committee is officialy defined in the DISPATCH No. 007 / 2010 issued by MEGC. This function is as following:
3. To supervise the Survey and to monitor the progress of the procedure inside the GoCV.
4. The Committee is composed of representatives from JICA, MEGC, ELECTRA, Ministry of Agriculture and Environment, Ministry of Finance, National Institute for Water Resources Management (INGRH) and relevant municipalities.

All the members of Project Steering Committee confirmed that they fully understand the function, organisation and purpose of Project Steering Committee.

Subject discussed during the meeting of Project Steering Committee

The JICA study team first presented all results and propositions related to the project at this time. These results and propositions are detailed in appendix 2.

Following the presentation, the following points have been discussed:

a. Target municipalities:

The JICA study team together with the Steering Committee confirmed that all the municipalities of Santiago Island shall be targeted by the project.

b. Project scope

The JICA study team stated that the project scope is depending on others donors projects and asked for clarification on this point. The Representative of General Direction of Planning at the Ministry of Finance, Mr. Maia, precised that the others donors projects (loan type) related to water development which are due to be signed in 2010 are:

- Development of water system in Santiago 5000m3/day with Spanish cooperation
- Dams construction project with Portuguese cooperation
- Water pipeline construction between Sao Miguel and Assomada with Indian cooperation

In addition, Mr. Maia stated that the World Bank 5000m3/day water development

project (desalination) is overviewed for 2012. He has not heard about the Luxembourg development project.
The JICA study team stated that the scope of the project is also depending on the operation and maintenance organisation. The JICA study team asked for the Steering Committee and Government of Cape Verde to propose the organisation of operation and maintenance of the project installations, including budget management.

The JICA study team proposed three main options for water system development. These options are detailed in the appendix 2. The JICA study team explained these options do not take into account the loss of water supply, the projects by other donors or organisations, the use of existing well ressources. The JICA study team asked for comments of Steering Committee for each of the three options.

The Steering Committee explained its concern about power availibility for desalination plant. The Steering committee asked whether a power development item (using renewable energy) is included in this project. The Steering Committee asked the JICA study team to evaluate the power consumption of each of the three options. The JICA study team explained that the scope of this project is not including the development of power capacity, however power development projects are undergoing at this time. The JICA study team stated that this study is considering as a basic assumption that the power is available and sufficient. The JICA study team stated that the necessary power consumption will be studied.

The Steering Committee has asked whether or not the use of groundwater for mixing with desalinated water would not go against the general idea that groundwater should be left for irrigation and agricultural purpose and desalinated water for potable water use. The JICA study team answered that desalinated water is the main solution for drinking water, and will assess whether the use of groundwater can be available for economizing capacity of desalination plant and reducing operation costs.

The Steering Committee expressed its concern about environment regarding desalination plants, pipelines, and brine discharge in the vicinity of potential touristic place in the case of option 2 and option 3. The JICA study team answered that pipelines are foreseen to follow existing roads, and that area of influence of brine discharge is quite limited when discharging in sea water, these points shall however be studied by EIA.

The Steering Committee asked whether or not there would be a possibility to involve Cape Verdian local engineers in the JICA study team in order to assist the JICA study team. The JICA study team answered that any local contribution of Cape Verdian local engineers is welcomed, however presently involvement of Cape Verdian engineers in the study team is not foreseen.

The Steering Committee asked whether the scope is including rehabilitation of existing distribution network. The JICA study team answered that rehabilitation of existing distribution network is not included in the project.

The JICA Study team stated that based on these comments about scope of the project, one of the three main options will be proposed for further steps of the project.

c. Project sites

The project sites has not yet been selected.

d. Specification of facilities

The JICA study team stated that the capacity of developped water system will be resized according to the information about others donors projects.

e. Project cost

The Steering Committee expressed its concern about price of water because of cost of desalination technology and heavy use of power. The JICA study team answered that the use of desalination is a basic assumption for this study. The price of water should not differ much from the existing desalination plant.

The project cost will be revised in the light of comments and information coming from Steering Committee.

f. Procurement structure

The MECC will be in charge of procurement (tendering, land acquisition) for the project.

g. Project implementation

The MECC is in charge of project implementation.

h. Operation and management organizations

The JICA study team asked the Steering Committee and Government of Cape Verde to propose the organisation of operation and maintenance of the project installations, including budget management, in order to assure an appropriate management for sustainable operation and maintenance.

i. Financial structure

Basically, the project is overviewed to be financed by Japanese Government.

j. Tariff system

The JICA study team asked the Steering Committee and ARE to think about a suitable tariff system in the light of the existing tariff and affordable tariff by people.

k. Concession structure

The JICA study team asked for any information regarding the possible creation of a concession structure for management of water supply system.

l. IEE and EIA schedule, and organisation

The JICA study team explained that the IEE will be conducted by the JICA study team. The EIA will be conducted by Government of Cape Verde following JICA environmental guidelines, and JICA study team can assist the Government to apply the guidelines for EIA if it is requested.

Steering Committee on Water Supply System Development Project in Cape Verde

February 8, 2010 at Praia

Japan International Cooperation Agency

Toyo Engineering Corporation
Ingérosec Corporation
UNICO International Corporation

1. **Opening Remarks**
2. **Purpose of Steering Committee**
3. **JICA Study Explanation**
4. **JICA Study Status**
5. **Discussion**
6. **Closing Remarks**

1. Opening Remarks
2. **Purpose of Steering Committee**
3. JICA Study Explanation
4. JICA Study Status
5. Discussion
6. Closing Remarks

Background of Steering Committee

- The Government of the Republic of Cape Verde (GoCV), in cooperation with the Government of Japan (JICA), 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.
- Given the specific and strategic significance of the project, a diligent and efficient technical follow-up will be needed for the same.
- In the scope of implementation of the above mentioned project, there will be a need to guarantee, to GoCV, reliable technical counsel and assistance.
- 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.

➡ ***The GoCV understands that it is very important PROJECT STEERING COMMITTEE be established.***

Objectives of Committee and its Composition

- According to Minutes of meeting dated 23rd, October 2009 between GoCV and JICA, a Project Steering Committee is needed to be established.
  The objectives and its composition are described as follows;

- The JICA Mission and the MEGC agreed to set-up the Project Steering Committee to supervise the Survey and
  to monitor the progress of the procedure inside GoCV.

- The Committee will be composed of representatives from
  JICA, MEGC, ELECTRA,
  Ministry of Agriculture, Rural Development and Maritime Resources (MADRRM),
  Ministry of Finance, Ministry of Infrastructure and Transport,
  INGRH, and relevant municipalities.

Discussion Items with Steering Committee

To harmonize any opinions among relevant agencies, and
to promote smooth decision by GoCV,
following subjects shall be discussed with the Committee.

a) To set criteria to select the target municipalities to be developed,

b) To identify the Project scope, including project sites, specification of facilities, project cost, procurement structure, etc,

c) To set-up and establish the project implementation, operation and management organizations,

d) To establish financial structure, including tariff system, concession structure, staff allocations, etc.

1. Opening Remarks
2. Purpose of Steering Committee
3. **JICA Study Explanation**
4. JICA Study Status
5. Discussion
6. Closing Remarks

Background of JICA Study

In 1992, Government of Cape Verde made the master plan on Water resources development 1993-2005, for achieving safety and sustainable drinking water supply ratio up to 100% by year 2005.

As the result, water supply ratio improved up to 65%, but it is still not enough to keep safety and sustainable water.

Most of fresh water for Santiago island is produced by the seawater desalination plant, and especially Praia city depends on ¾ of water to desalination plant.

Also one of important policy in Cape Verde is to <u>develop tourism</u>.

For realizing this policy, it is necessary to have sustainable and safe water and its supply network.

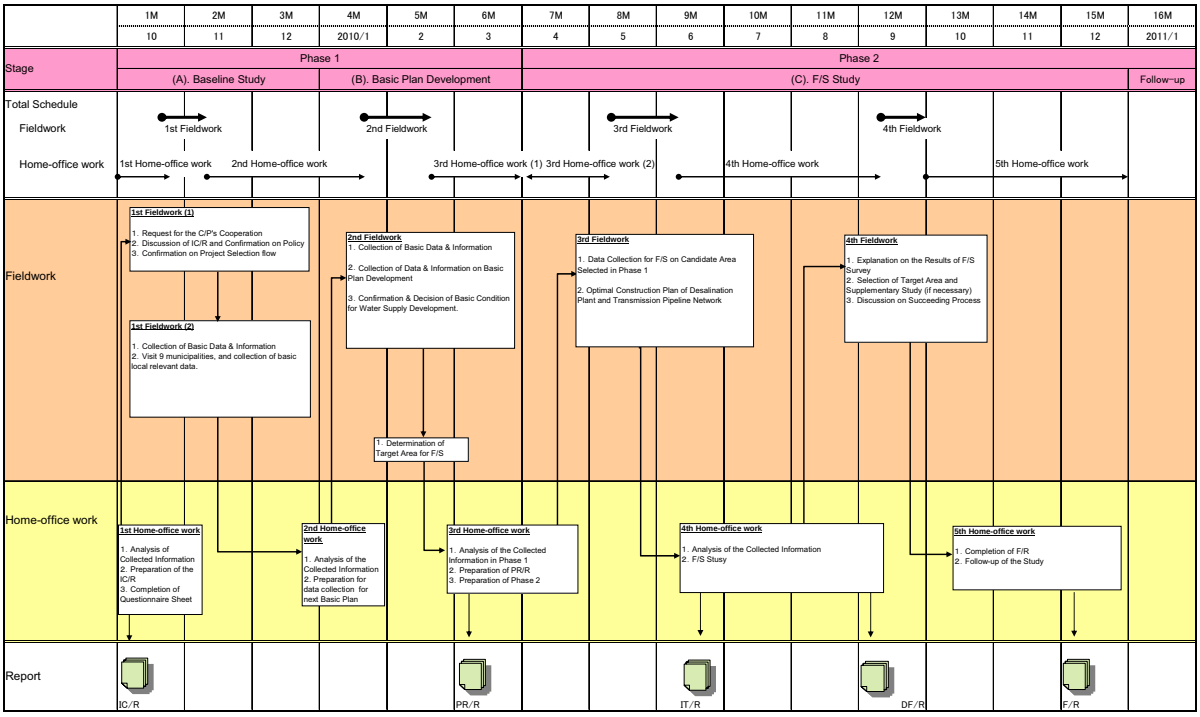
Objective of JICA Study

1) <u>to verify the feasibility of the project</u> including

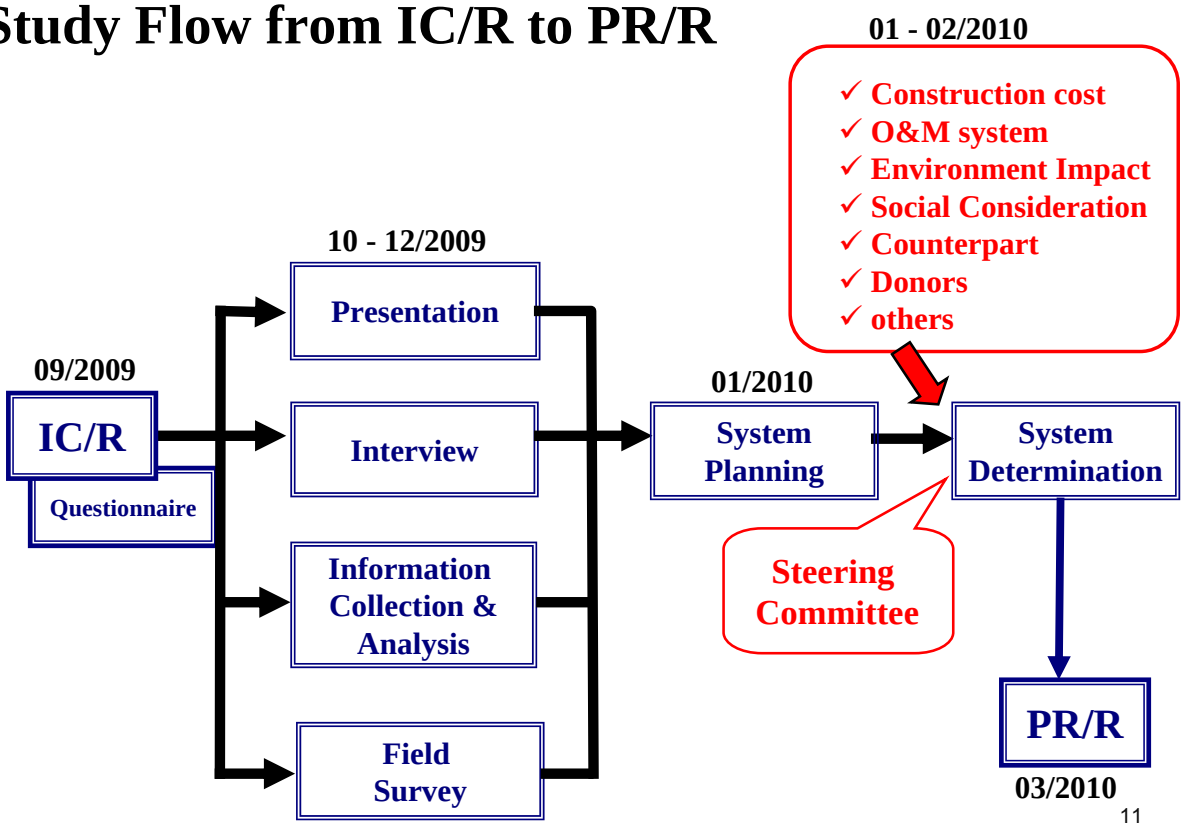
- Increase of fresh water by construction of seawater desalination plant,
- Construction and/or rearrangement of wide area water distribution network to targeted cities, and
- For corresponding the current and future water shortage by economic growth in Santiago island <u>around 2020</u>.

2) <u>to find suitable project</u> for Japanese yen and/or other fund credit.

Study Flow and Time Schedule of JICA Study



Study Flow from IC/R to PR/R

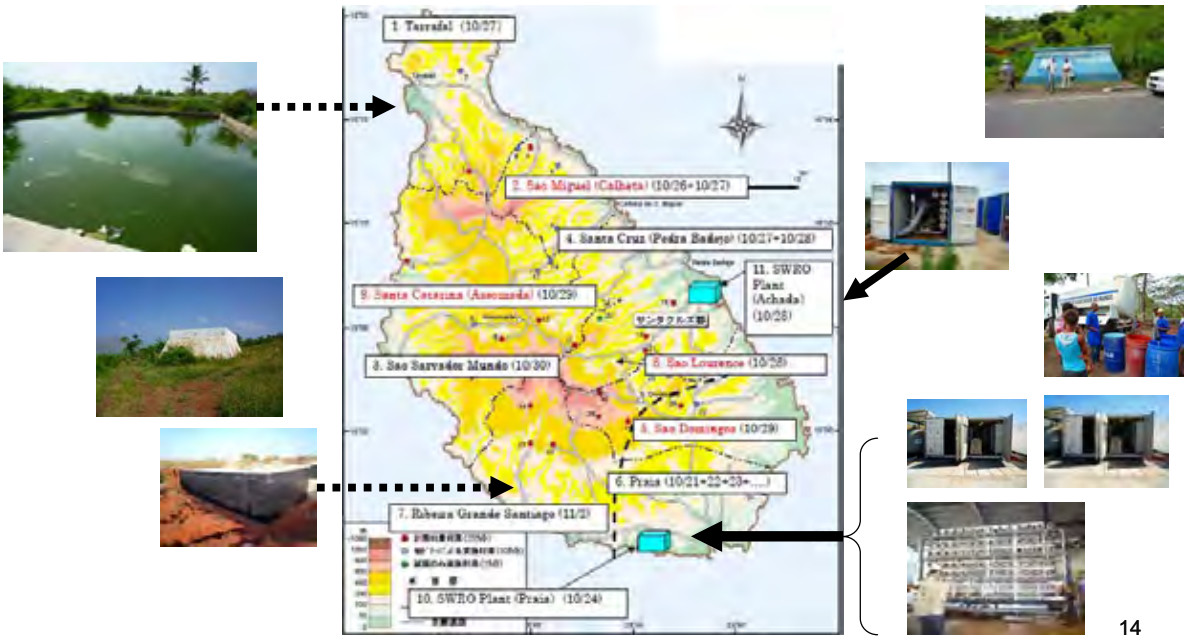


1. Opening Remarks
2. Purpose of Steering Committee
3. JICA Study Explanation
4. **JICA Study Status**
5. Discussion
6. Closing Remarks

Part-1: Summary of 1st field and 2nd domestic work

1. 1st Field Work Summary
2. Interview Records from Municipality
3. Information Analysis
4. Horizons of Water Demand
5. Water Supply System Study
6. other Water Projects in Santiago
7. Steering Committee Establishment

1. 1st Field Work Summary



2. Visit and Interview to all Municipalities

1. *Tarrafal*
2. *Sao Miguel*
3. *San Salvador do Mundo*
4. *Santa Cruz*
5. *Sao Domingo*
6. *Praia*
7. *Ribeira Grande de Santiago*
8. *San Lourenco dos Orgaos*
9. *Santa Catarina (Assomada)*

Interview Summary by MEGC and JICA *as of Oct. 2009*

MUNICIPALITY	unit	S.Miguel	Tarrafal	Santa Cruz		S L D Orgaos	Santa Catarina	Picos	Ribeira Grande		S. Domingo		Praia all	
population		17,000	21,000	30,000		10,000	50,000	10,000	12,000		14,300		120,000	
water supply	m3/day		1160	1200		420	900		250		880		6,802	
water supply loss	%	15-20	34	35			30-40		not available		12		31,5	
water to people	%		75	80		d60-r40	100		33		47		100	
water to agriculture	%		25	20		r60-d40	0		not available		53		0	
water consumption,	l/d/person		55	40		~20	18		30		30		57	
connection to householdrate	%	60	70	82		57		15-16	600 household		21		54	
water price for people	m3/CVE												325	
	0-5m3	220	108	220	0-6m3	500	80	see below	253	0-6m3	220	0-4m3	234	0-6m3
	6-10m3	280	134	280	6-10m3	150	120		354	6-10m3	280	4-8m3	343	>6-10m3
	10-15m3	10+m3 350	189	340	10m3+	170	150		442	10m3+	340	8m3+	457	>10 m3
	15+ m3		269			300	200							
water price for irrigation	CVE/m3													
	Manual	35/m3		25/m3	manual		n/a		n/a		25/m3	manual	n/a	
	Drip system	22/m3		8/m3	Drip system		n/a		n/a		15/m3	Drip system	n/a	
contract fee	CVE	3,000	3,450	varies 8000-14000		4,000			6,000		14,000		varies 9,900-35,000	
tax	CVE/m3			15										
price	CVE/m3		1000 by habitat	1850				350 by habitat						
RO desalination	m3/d	500	n/a	540		n/a	n/a	n/a	n/a		n/a		7400	
from		well near sea	n/a	well near sea		n/a	n/a	n/a	n/a		n/a		sea water	
well water	m3/d	═══	1137	660		varies	900				880		900	
well number			12	8		7	16	5	2+		14		6	
reservoir number		30	2	45		26		3	6+					
reservoir capacity	m3	10 - 500	150	20-1000		8-100		50/40/40	1000/50/30/20					
fountain water	m3/d		23			745 in 10/09			250					
fountain number						4			3+					

from S Catarina via PL	80
from S Domingo via truck	310
from S Cruz via truck	270
from S Catarina via PL	80

3. Information Analysis

Water Production in the Santiago Island

Municipality	2006			
	Potable Water m^3/year	Industrial m^3/year	Total m^3/year	Total m^3/day
Tarrafal	237,011	—	237,011	649.35
São Miguel	89,512	—	89,512	245.24
São Salvador do Mundo	*Within S.Catarina*	—	—	—
Santa Cruz	299,623	7,856	307,479	842.41
São Domingos	128,665	1,670	130,335	357.08
Praia	2,723,248	74,387	2,797,635	7,664.75
Ribeira Grande de Santiago	*Within S.Catarina*	—	—	—
São Lourenço dos Orgaos	*Within S.Catarina*	—	—	—
Santa Catarina	563,492	—	563,492	1,543.81
Total (Santiago Island)	4,041,551	83,913	4,125,464	11,302.64

Horizons of Population in Santiago Island, 2010

Municipality	2000				2010				Evolution of Population
	Total	Urban	Rural	% Urban	Total	Urban	Rural	% Urban	
Tarrafal	17,883	5,810	12,073	32.5	23,786	8,027	15,759	33.7	24.8%
São Miguel	16,213	5,017	11.196	30.9	17,602	6,042	11,560	34.3	7.9%
São Salvador do Mundo	9,214	1,148	8,029	12.5	10,950	1,459	8,029	13.3	15.9%
Santa Cruz	25,333	8,575	16,693	33.8	30,038	11,707	16,693	39.0	15.7%
São Domingos	13,381	1,607	11,774	12.0	14,421	2,212	12,209	15.3	7.2%
Praia	97,232	94,361	2,897	97.0	131,453	129,163	2,897	98.3	26.0%
Ribeira Grande de Santiago	9,664	1,346	8,318	13.9	9,618	1,435	8,183	14.9	-0.5%
São Lourenço dos Orgaos	7,847	1,437	6,410	18.3	9,285	1,831	7,454	19.7	15.5%
Santa Catarina	41,061	7,297	33,764	17.8	48,535	14,380	34,155	29.6	15.4%
Total (Santiago Island)	237,828	126,598	99,969	53.2	295,688	176,256	116,939	59.6	19.6%

Data source: Census 2000, "Resultado de Revisão das Projecções Demograficas 2000-2020".

Urban area population increased.

Horizons of Population in Santiago Island, 2020 - preliminary

➢ ***Horizons will be discussed and confirmed during 2nd field survey***

Municipality	2020			
	Total	Urban	Rural	% Urban
Tarrafal	31,638	11,041	20,596	34.9
São Miguel	19,110	7,204	11,906	37.7
São Salvador do Mundo	13,013	1,835	11,178	14.1
Santa Cruz	35,617	15,743	19,874	44.2
São Domingos	15,542	2,891	12,651	18.6
Praia	177,718	177,007	711	99.6
Ribeira Grande de Santiago	9,572	1,522	8,050	15.9
São Lourenço dos Orgaos	10,987	2,318	8,668	21.1
Santa Catarina	57,369	23,751	33,618	41.4
Total (Santiago Island)	370,566	243,313	127,253	65.7

Total : Estimated by "evolution of population" during 2000-2010

Rural : Estimated by "evolution of urban area population" during 2000-2010

4. Horizons of Water Demand *- preliminary -*

➢ ***Horizons will be discussed and confirmed during 2nd field survey***

➢ ***Including tourism and industry, excluding water loss***

Municipality	Population (year 2000)	Population (year 2008)	City area (%)	Population (year 2020, estimated)				Round Figure (m3/d)
				person	m3/d			
1. Tarrafal	17,883	22,453	33.50%	31,637	2,134	Now 422,000m3/y x 75%		
					2,384			2,400
2. Sao Miguel	16,213	17,291	33.60%	19,110	1,316	→	Italy 3,500m3/d	
					1,641			1,600
3. Sao Salvador Mundo, Picos	9,214	10,560	13.20%	13,013	742			
					742			700
4. Santa Cruz (Pedra Badejo)	25,333	28,989	37.90%	35,617	2,568	→	Italy 1,000m3/d	
					2,893			2,900
5. Sao Domingos	13,381	14,230	14.70%	15,542	922		Luxenburg 2500m3/d	
					922			900
6. Praia	97,232	123,741	98.00%	177,718	17,736		Now 15,000m3/d	
					19,986			20,000
7. Ribeira Grande Santiago (*)	9,664	9,639	14.70%	9,572	555			
					555			600
8. Sao Lourenco Orgaos (*)	7,847	8,961	19.40%	10,986	665			
					665			700
9. Santa Catarina (Assomada)	41,061	46,866	27.30%	57,369	4,056		Now 1,000m3/d	
					6,056			6,000
				person	m3/d			
Total	**237,828**	**282,730**		370,564	30,694			
					35,844			*35,800*

4. Horizons of Water Demand *- presumption -*

Water consumption, l/day/person	**urban**	**100**
	rural	**50**
	tourist	**250**

Tourist Hotel Bed, number	**Tarrafal**	**200**
	Sao Miguel	**500**
	Santa Cruz	**500**
	Praia	**5,000**
	Santa Catarina	**6,000**

Horizon of water consumption, l/person/day

Year	Urban			
	% Coverage Public Pipe	Consumption l / person / day	% Coverage Fountain	Consumption l / person / day
2010	90	100	10	25
2020	100	150	—	—

100 in urban

Year	Rural			
	% Coverage Public Pipe	Consumption l / person / day	% Coverage Fountain	Consumption l / person / day
2010	20	50	80	25
2020	25	80	75	30

50 in rural

Data source : "National Vision on Water, Life and Environment on the horizon 2025" by INGRH (2000)

WHO recommend 100 litter/person/day

Horizons of Water Demand in detail (1/2)

	l/d/person
Urban	100
Rural	50
Hotel	250

ratio 15% 4

Municipality	Population (year 2000)	Population (year 2008)	City area (%)	Population (year 2020, estimated) year 2008			person	m3/d	Round Figure (m3/d)
1. Tarrafal	17,883	22,453	33.50%				31,637	2,134	Now 422,000m3/y x 75% (for Potable)
Urban		7,522					11,041	1,104	= 870m3/
Rural		14,931					20,596	1,030	
Hotel				50	200	beds		50	
Industry								200	
								2,384	2,400
2. Sao Miguel	16,213	17,291	33.60%				19,110	1,316	Italy 3,500m3/d
Urban		5,810					7,204	720	
Rural		11,481					11,906	595	
Hotel				100	400	beds		100	
Industry								200	
								1,616	1,600
3. Sao Salvador Mundo, Picos	9,214	10,560	13.20%				13,013	742	
Urban		1,394					1,835	184	
Rural		9,166					11,178	559	
Hotel				0	0	beds		0	
Industry								0	
								742	700
4. Santa Cruz (Pedra Badejo)	25,333	28,989	37.90%				35,617	2,568	Italy 1,000m3/d
Urban		10,987					15,743	1,574	
Rural		18,002					19,874	994	
Hotel				100	400	beds		100	
Industry (Cement)	China							200	
								2,868	2,900
5. Sao Domingos	13,381	14,230	14.70%				15,542	922	Luxenburg 2500m3/d
Urban		2,092					2,891	289	at S.Francisco
Rural		12,138					12,651	633	
Hotel				0	0	beds		0	
Industry								0	
								922	900

Note 1 : Number of bed is estimated based on the data by Tourist data analysis (PD consultant).

Note 2 : Consumption for tourist and Industry are estimation by JICA study team.

Horizons of Water Demand in detail (2/2)

	l/d/person
Urban	100
Rural	50
Hotel	250

ratio 15% 4

Municipality	Population (year 2000)	Population (year 2008)	City area (%)	Population (year 2020, estimated) year 2008			person	m3/d	Round Figure (m3/d)
6. Praia	97,232	123,741	98.00%				177,718	17,736	Now 15,000m3/d
Urban		121,266					177,007	17,701	
Rural		2,475					711	36	
Hotel				600	2,400	beds		600	
Industry								1,500	
								19,836	20,000
7. Ribeira Grande Santiago (*)	9,664	9,639	14.70%				9,572	555	
Urban		1,417					1,522	152	
Rural		8,222					8,050	403	
Hotel				0	0	beds		0	
Industry								0	
								555	600
8. Sao Lourenco Orgaos (*)	7,847	8,961	19.40%				10,986	665	
Urban		1,738					2,318	232	
Rural		7,223					8,668	433	
Hotel				0	0	beds		0	
Industry								0	
								665	700
9. Santa Catarina (Assomada)	41,061	46,866	27.30%				57,369	4,056	Now 1,000m3/d
Urban		12,794					23,751	2,375	at2020, 3,775m3/d
Rural		34,072					33,618	1,681	
Hotel				300	1,200	beds		300	
Industry								1,500	
								5,856	6,000
							person	m3/d	
Total	**237,828**	**282,730**					370,564	30,694	
Urban		**165,020**					243,312	24,331	
Rural		**117,710**					127,252	6,363	
Hotel				1,150	**4,600**	beds		1,150	
Industry								3,600	
								35,444	*35,800*

Note 1 : Number of bed is estimated based on the data by Tourist data analysis (PD consultant).

Note 2 : Consumption for tourist and Industry are estimation by JICA study team.

5. Water Supply System Study *- presumption -*

- Whole potable water demand in 2020:

35,800 m³/day

- Existing Desalination Capacity in 2010 in Praia and S. Cruz

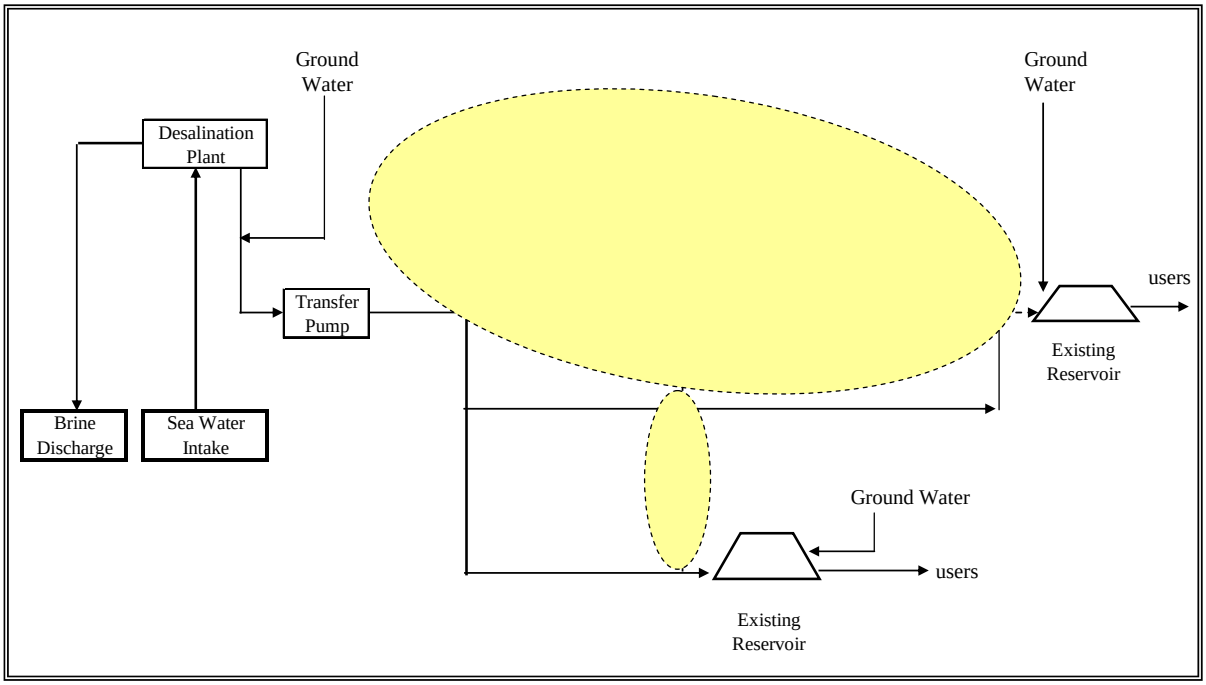
7,900 m³/day

- Additional Capacity for whole demand

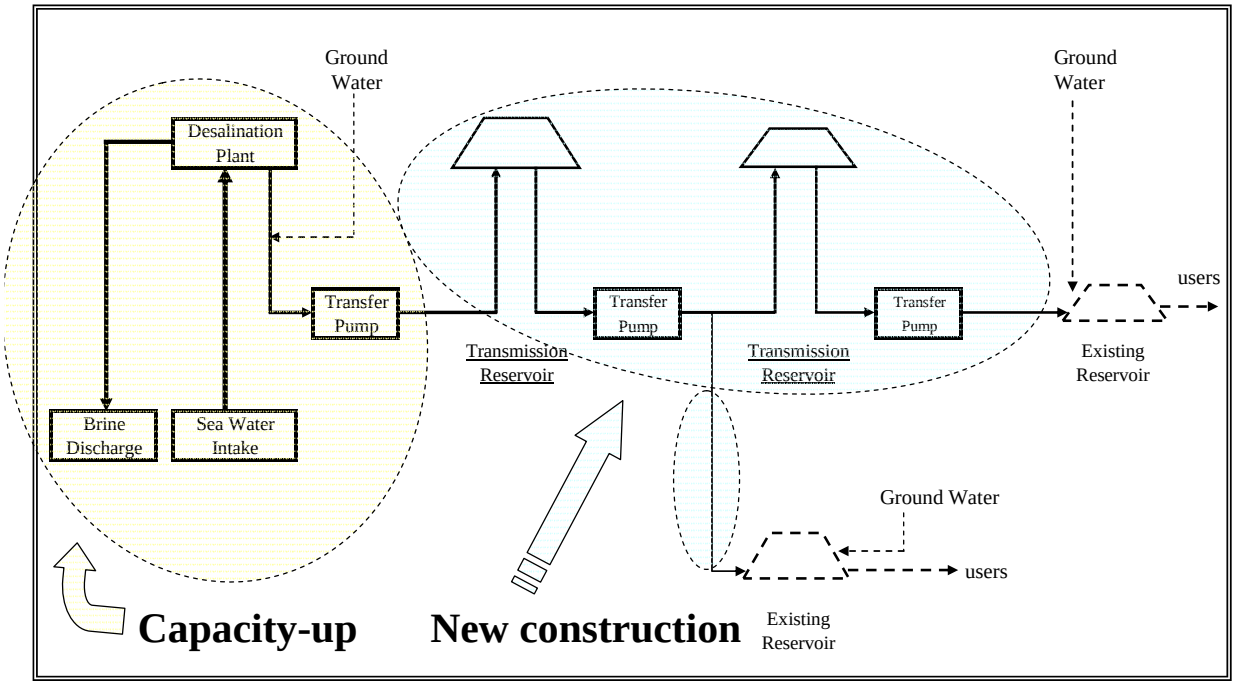
<u>27,900 m³/day</u>

Note: Ground water utilization and Water loss are not countered.

Water Supply System Study *existing system*



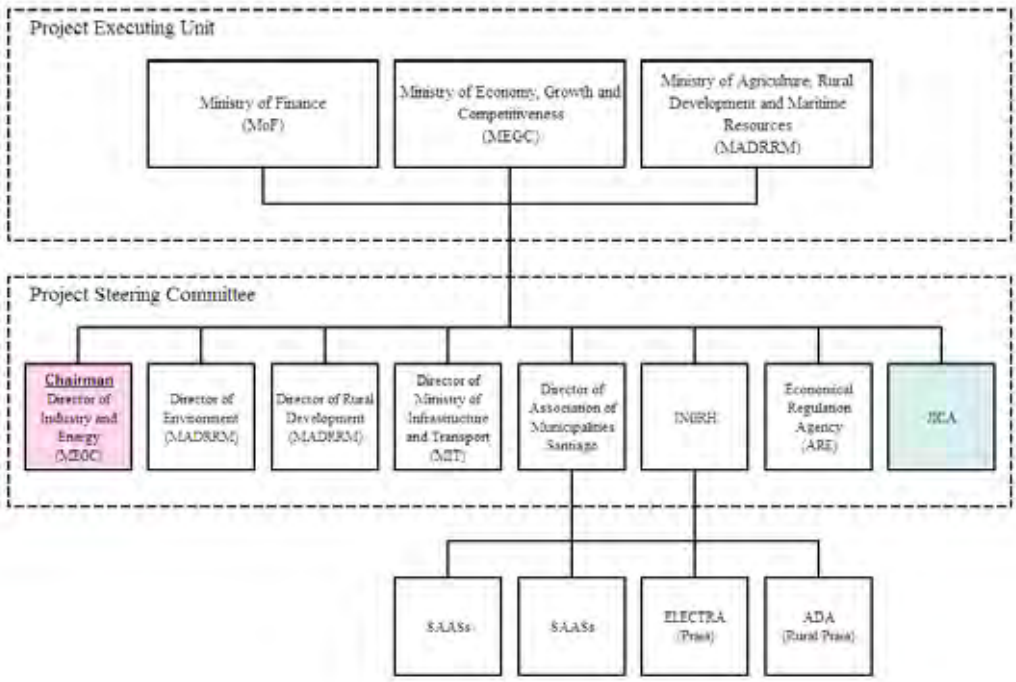
Water Supply System Study *new system*



6. Other Water Projects in Santiago

ODA basis	**- World Bank for 5000-7500m^3/day of water production in Praia under discussion of IBRD funding, after 2012** **- Spain for 5000m^3/day of water production in Praia under negotiation, after 2010 discussion** **- Spain for reservoir , transfer line and distribution line in Cidade Velha** **Phase-1 reservoir construction finished** **Phase-2 line construction will be constructed and connected** **- China for dam** **Phase-1 construction finished** **Phase-2 utilization under discussion** **- French for F/S on ground water supply and sanitation in Assomada** **- Luxemburg for plan on 2,500m^3/day of water production with 9km line in S. Domingo** **- Portugal for other dam ?** **- Morocco for Cidade-Praia network rehabilitation ?** **- 18km pipeline for Calheta and Santa Catarina**
Private basis	***- Lachesi of Italy for 3,500m3 of water production in Calheta, S. Miguel to Assomada under negotiation*** ***- Lachesi of Italy for 500+500m3 of water production in Pedro Badejo, S. Cruz to Assomada under discussion*** ***- CAIS (Company of water introduction Santiago), 30 year Concession Company Lachesi: GoCV=80:20(max)***

7. Steering Committee Establishment

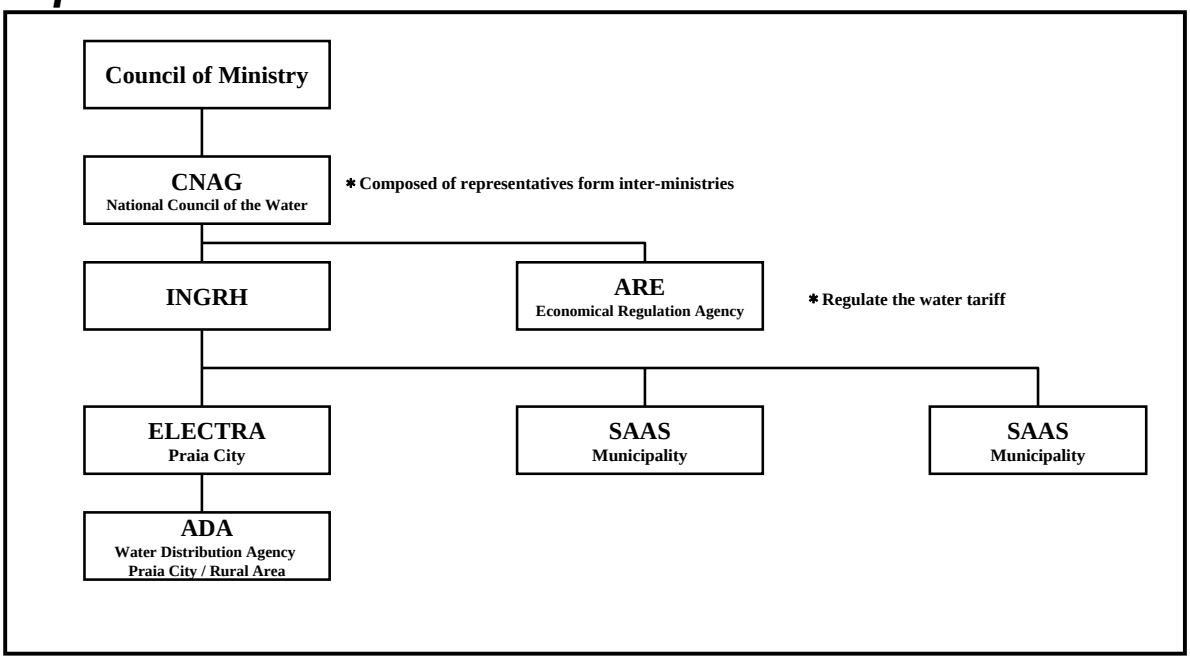


Part-2: Summary of 2nd field work

1. Water related Organization review
2. Project case selection
3. ROM cost estimation
4. Ground water utilization
5. System discussion
6. IEE and EIA

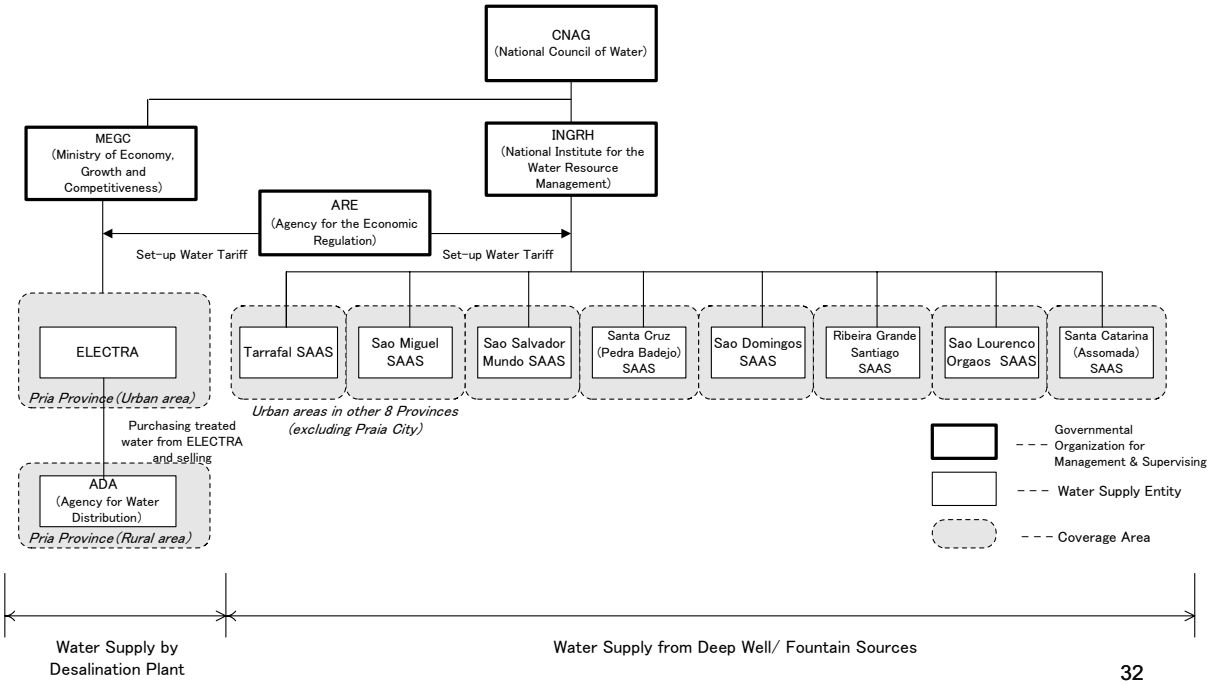
1. Organization and Institution review

- for review -

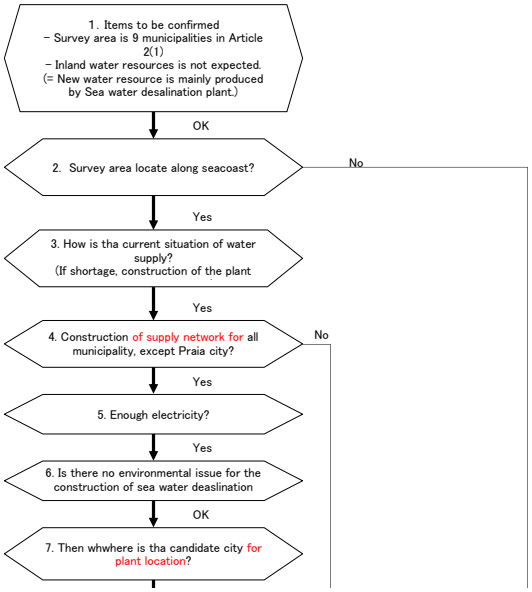


Administrative Framework for Water Supply

- under review -



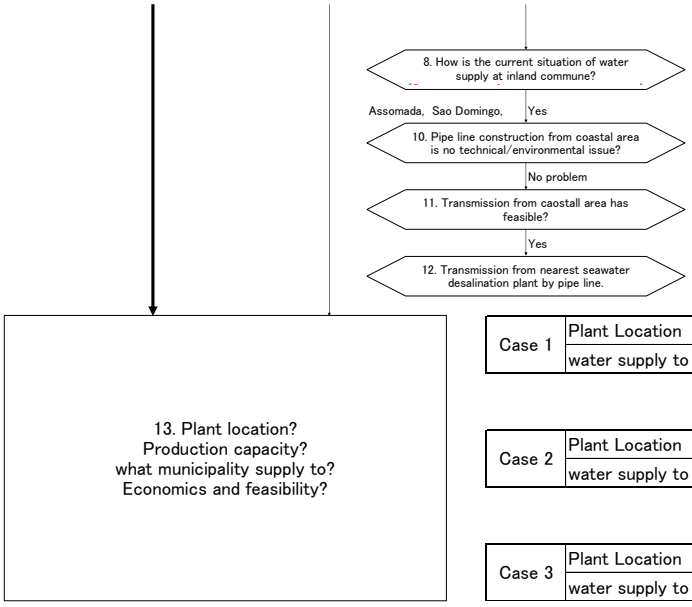
2. Project Case Selection (1/3)



1 TRFL	2 SMG	3 SSdM	4 SCRZ	5 SDmg	6 Praia	7 RbGr	8 SLdO	9 SCtr
○	○	○	○	○	○	○	○	○
○	○		○		○	○		
(○)	○		○		○	(○) enough water		
(○)	○	○	○	○	○	○	○	○
(○) Future supplied	(○) Soon supplied		(○) Soon supplied		○	○		
○	○	○	○	○	○	○	○	○
(○)	○		○		○			

Candidate Supply Base

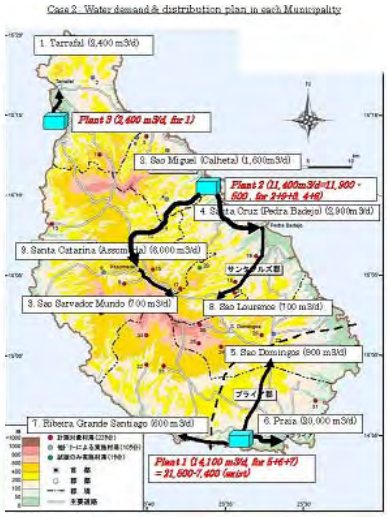
Project Case Selection (2/3)



		1 TRFL	2 SMG	3 SSdM	4 SCRZ	5 SDmg	6 Praia	7 RbGr	8 SLdO	9 SCtr
				○ Shortage		○ Shortage			○ Shortage	○ Shortage
				○		○			○	○
				○		○			○	○
				○		○			○	○
Case 1	Plant Location						○			
	water supply to	○	○	○	○	○	○	(○)	○	○
Case 2	Plant Location	○	○				○			
	water supply to			○	○	○		(○)	○	○
Case 3	Plant Location	○	○		○		○			
	water supply to			○		○		(○)	○	○

Project Case Selection (3/3)

Case 1 *Case 2* *Case 3*

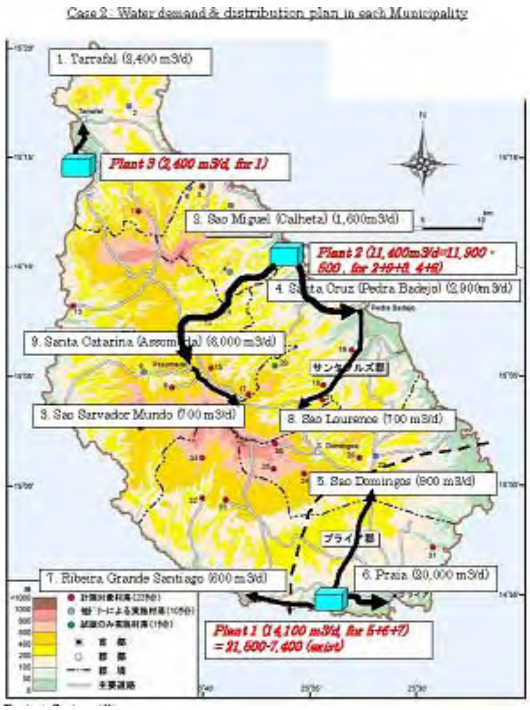


Case 1: One Desalination Plant at Praia

1. **Expected Advantage**
   1) **Lower construction cost for desalination plant**
   2) **Centralized operation and management**

2. **Disadvantage**
   1) **Higher construction cost for pipeline**
   2) **Market sharing with ELECTRA and other Municipalities**
   3) **Risk of water leak and loss**
   4) **Risk of one water supplier**

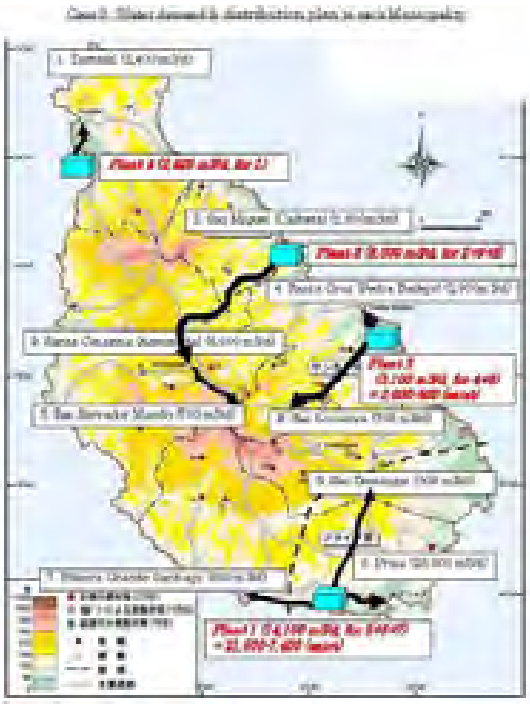
Case 2: Three Plants at Praia, Sao Miguel and Tarrafal



1. Expected Advantage
   1) Lower construction cost for pipeline
   2) Job creation in local Municipalities
   3) Lower conflict between ELECTRA and other Municipalities
   4) Risk Decentralization from one water supplier

2. Disadvantage
   1) Higher construction cost for desalination plants
   2) More Training and people required for Operation and Maintenance

Case 3: Four Plants at Praia, Santa Cruz, Sao Miguel and Tarrafal



1. Expected Advantage
   1) Lower construction cost for pipeline
   2) Job creation in local Municipalities
   3) Lower conflict between ELECTRA and other Municipalities
   4) Risk Decentralization from one water supplier
   5) Adjustment against other Donor's projects

2. Disadvantage
   1) Higher construction cost for desalination plants
   2) More Training and people required for Operation and Maintenance

3. ROM cost estimation

Presumptions:

<u>Preparatory Design basis</u>

<u>Estimation: in-house basis with relative cost</u>

Sea water: available and not specific treatment required

Electric Power: available

EPC contractor: foreign

Equipment and Material: imported

Desalination plant: Reverse Osmosis type, and non specific requirement for installation

Transmission Reservoirs: concrete with 12 hours holdings

Transfer Line

- **Carbon Steel with lining for HP service**
- **HDPE for LP service**

Transfer Pump: 1+1 with Electrical motor driven

Water Supply System Study *selection criteria*

criteria	unit	Case 1	Case 2	Case 3	remarks
Total Water Production	m^3/day	27,900	27,900	27,900	
Praia		27,900	14,100	14,100	
Tarrafal		-	2,400	2,400	
Sao Miguel		-	11,400	8,300	
Santa Cruz		-	-	3,100	
No. of Desalination plants		one	three	four	
Relative construction cost	%	100	77	74	
	%	136	104	100	
Total Construction Cost		×	○	○	
Dasalination Plant		◎	○	○	
others (Lines and Reservoir)		×	○	◎	
O&M cost		×	○	○	
Dasalination Plant		◎	○	○	
others (Lines and Reservoir)		×	○	◎	
EIA cost		×	△	△	
Environmental Impact		△	△	△	
Social Consideration		△	△	△	
Ground water utilization					
comments from GoCV					
comments from Municipalities					
comments from donors					
JICA project (Yen loan) comment					
Project Profitability					
Overall Profitability					
JICA Recommendation					

qualitative evaluation

◎: *excellent*

○: *good*

△: *normal*

×: *negative*

4. Ground Water Utilization for Mixing with Desalinated Water

Ground Water Utilization Policy

Utilization of Ground Water for Mixing with Desalinated Water
- Availability in volume
- Availability in quality
- investment cost reduction
- potable water quality on minerals and Boron
- location, etc.

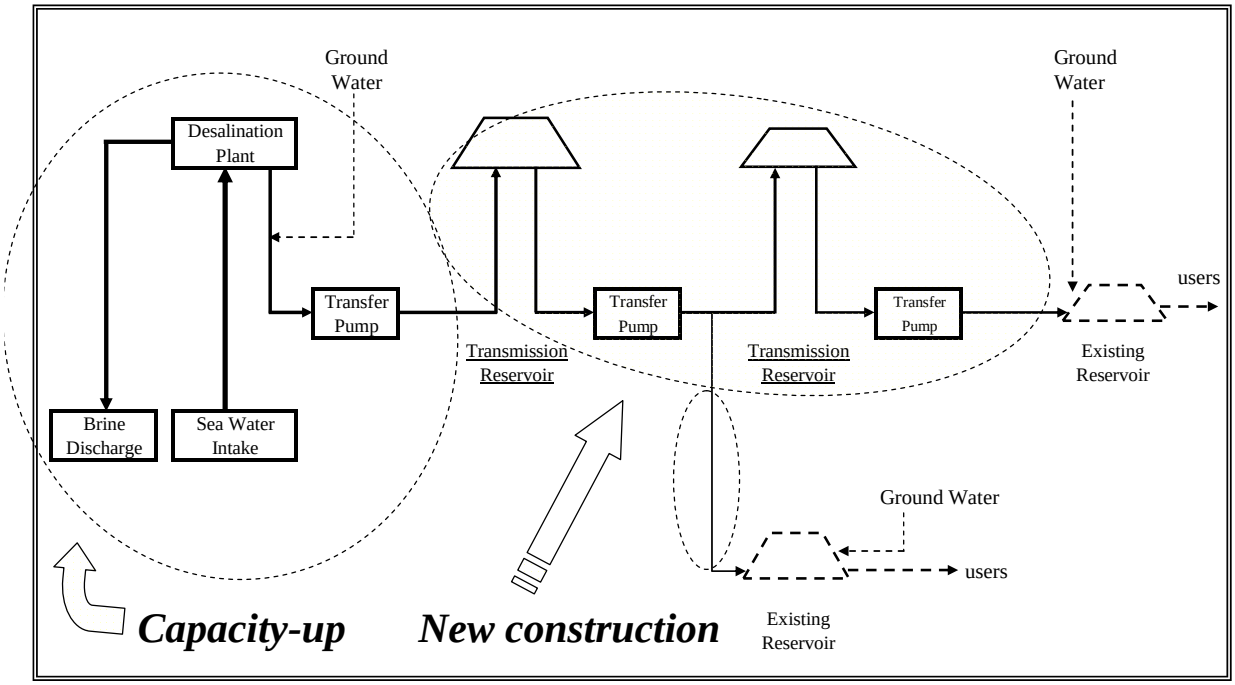
5. Water Supply System Discussion

3 cases were prepared.
For water supply system determination,
- Preparatory design was conducted,
- ROM construction cost was estimated, and
- Selection criteria was prepared.

1) JICA team will make Case recommendation <u>during staying</u>,

2) JICA team will make JICA Project Scope determination <u>after coming home</u>, and by the beginning of March.

Water Supply System Study *JICA Project*



6. IEE and EIA

- **<u>IEE will be carried</u> out in accordance with JBIC Guidelines 2002, relevant local laws and regulation <u>by JICA team</u>.**

- **EIA procedure and necessary items are provided in "decree No. 29/2006" in Cape Verde.**
- **<u>EIA will be conducted by consultants, and approved by MEGC</u>.**
- **EIA is necessary for MEGC to precede Project.**

- **Direction General of Environment is responsible to approve EIA Report.**
- **About 4 months takes for EIA report approval.**

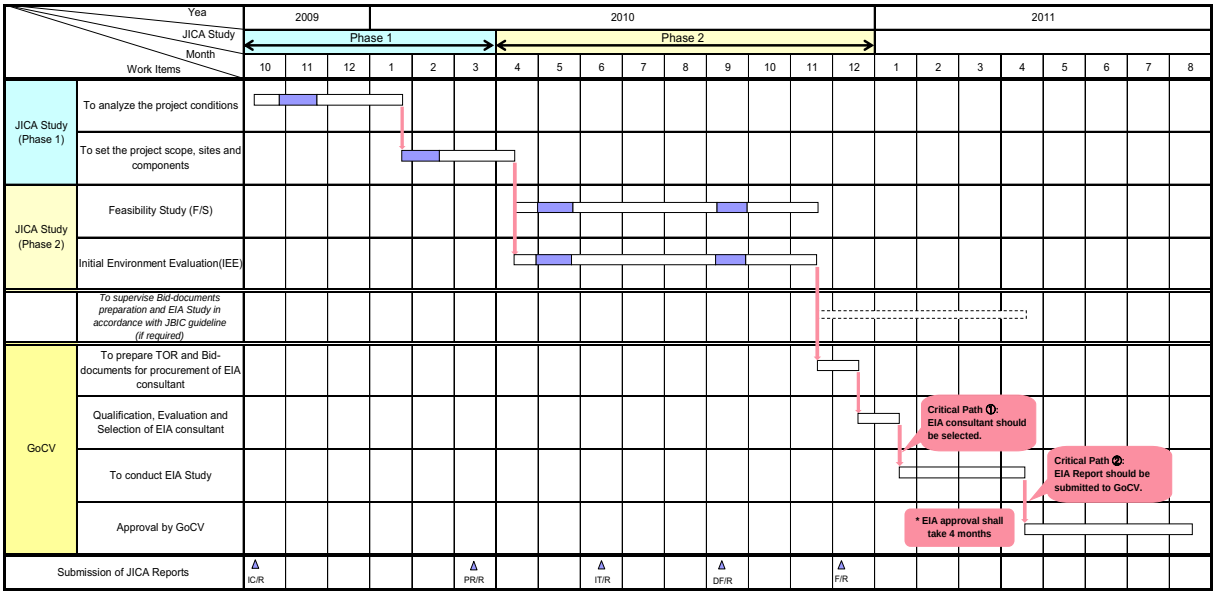
- **Time schedule should be discussed taking Cape Verde policy and Yen-loan into account.**

IEE and EIA *original time schedule*

DRAFT

EIA Schedule in JICA F/S, original

(* Terms and conditions: In the case of "Category B" under JBIC Guideline.)



Legend: Study Mission in Cape Verde, Domestic Work, Submission of Report

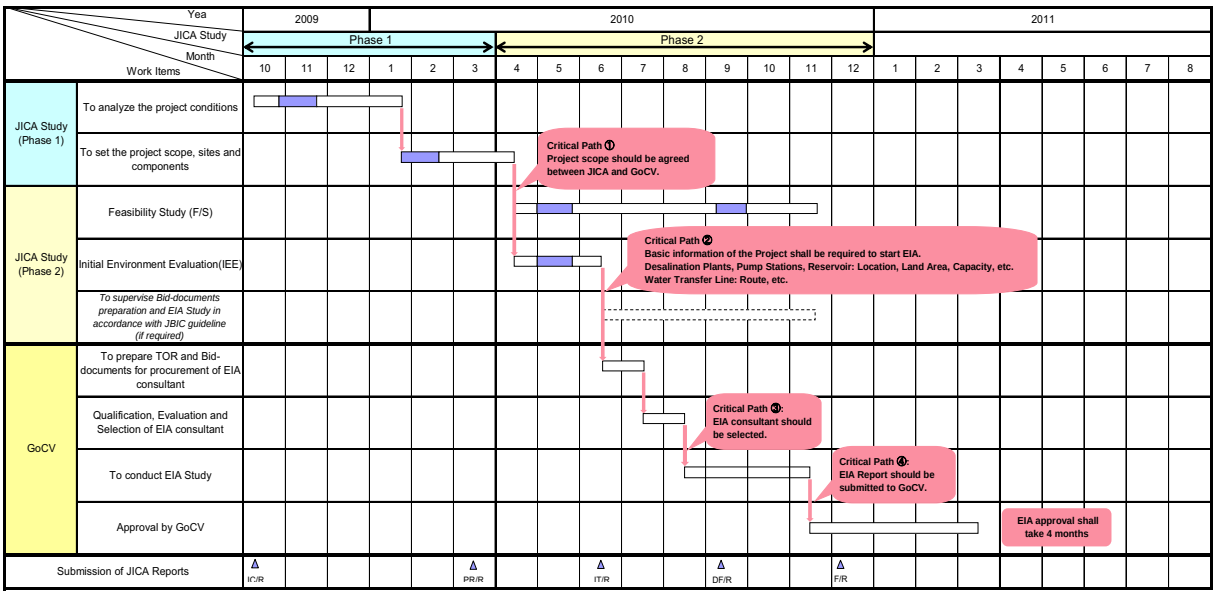
IC/R: Inception Report, PR/R: Progress Report, IT/R: Interim Report, DF/R: Draft Final Repot, F/R: Final Report

IEE and EIA *early L/A schedule case*

DRAFT

EIA Schedule in JICA F/S, early L/A case

(* Terms and conditions: In the case of "Category B" under JBIC Guideline and making loan agreement (L/A) within fiscal year 2010 between JICA and GoCV.)



Legend: Study Mission in Cape Verde, Domestic Work, Submission of Report

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

1. Opening Remarks
2. Purpose of Steering Committee
3. JICA Study Explanation
4. JICA Study Status
5. Discussion
6. Closing Remarks

a. Criteria to select the target municipalities to be developed,

b. Identification of the Project scope, including project sites, specification of facilities, project cost, procurement structure, etc,

c. Setting-up and establishment of the Project implementation, operation and management organizations,

d. Establish of the financial structure, including tariff system, concession structure, staff allocations, etc.

e. --

f. --

g. --

1. Opening Remarks
2. Purpose of Steering Committee
3. JICA Study Explanation
4. JICA Study Status
5. Discussion
6. **Closing Remarks**

Anexo 1-3

Minutes of Meeting (2nd Steering Committee)

&

Discussion materials

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

DATE: May 21st , 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 third time on the 21st of May 2010, in the office of Cape Verde Investment Agency, Praia, Cape Verde. The list of participants is given in Annex-3.
7. The main points discussed are based on the presentation by The JICA study team of all results and propositions related to the project at the time of the meeting. This presentation is given in Annex-1 and 2.
8. The Project Steering Committee members hereby confirmed full understanding of main points discussed as per Appendix 4.

By Chairman of the Project Steering Committee

Mr. Pedro Alcantara Silva
MTIE / General Directorate of Energy

MINUTES OF MEETING
ON
THE PROGRESS REPORT
FOR
THE PREPARATORY SURVEY
ON
WATER SUPPLY SYSTEM DEVELOPMENT PROJECT
IN
THE REPUBLIC OF CAPE VERDE

Praia, 26th May, 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 its arrival on May 17th, 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 Progress 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 Mission will proceed as planned up to December 2010, when the Survey comes to the end.

1. Explanation of Progress Report (PR/R)

The JICA Mission submitted seven (7) copies of the PR/R to the GoCV on 17th May.

The progress report was first presented by the JICA Mission to MTIE and discussed in Praia on 17th May. The JICA Mission presented the basic concept, outline and scope of the survey proposed in the PR/R.

The GoCV side agreed on the contents of the PR/R in principle, understood the survey objectives, schedule, activities and methodology, and promised close cooperation with the JICA Mission during the Survey.

2. Conditions of the Survey

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.

3. Major Points Discussed

(change of ministry in charge)

(1) The GoCV side explained that the Ministry of Economy, Growth and Competitiveness has been changed to Ministry of Tourism, Industry and Energy (MTIE) on April 2010. The MTIE will be responsible for the Survey.

(internal steering committee)

(2) The GoCV side explained the contents of the internal steering committee held on April 28th.

a. Case 1 can be postponed from the options. (Case 1 means Centralized water production in Praia.)

b. Taking into account the current water supply system and activities of other donors and firms in Santiago Island, the Steering Committee decided to propose to the JICA Mission an option for operation and maintenance of water supply facilities in Santiago Island.

c. The system will be composed by two areas, one which will cover the southern part of Santiago Island, and the other which will cover the northern part of Santiago Island. The details of the two areas are as below.

area	Municipalities		Production	Transmission/Distribution
North	6 Municipalities [Santa Catarina, Santa Cruz, Sao Miguel, Sao Salvador do Mundo, Sao Lourenco dos Orgãos, Tarrafal]	Facility Owner	CAIS or other company to be created	GoCV
		O/M	CAIS or other company to be created	"Inter Municipality Water Company" or other company to be created
South	3 Municipalities [Praia, Sao Domingos, Ribeira Grande de Santiago]	Facility Owner	Electra	GoCV
		O/M	Electra	Electra

d. Contents of the internal steering committee proposal has not been discussed yet with relevant Government authorities, including CNAG. It is an option to be considered by JICA Mission in this survey.

(activities of other donors and firms)

(3) As for the activities of other donors and firms the GoCV explained the below.

a. Financial cooperation of Spain (5,000m^3/day) and World Bank (5,000m^3/day) to expand the existing desalination plant in Praia, is official, and the Survey should include the two cooperation projects.

b. The concession contract between GoCV and CAIS is still under discussion. Therefore, CAIS projects to construct desalination plants in Sao Miguel and Santa Cruz are still under discussion.

c. Project to finance transmission line from Sao Miguel to Assomada is under discussion.

(4) For the above points, the JICA mission mentioned the below.

a. JICA Mission will consider the feasibility of the option proposed by the internal steering committee. JICA Mission will conduct the remaining survey for whole Santiago Island as planned.

b. The basic plan and feasibility study will be drafted taking into account activities and projects which are official at this point. With discussion with the GoCV, JICA Mission will propose an optimal plan.

c. In order to conduct meaningful and efficient survey, GoCV side should share any information, changes and results regarding water supply with the JICA Mission.

d. According to the preliminary calculation of the project cost, JICA envisaged the phasing the projects.

(Second Steering Committee)

(5) On May 21st, 2nd Steering Committee was held. JICA Mission explained the current status of the Survey using Annex-1. The conclusion of the steering committee was as follows.

a. Although the options need to be determined by CNAG, JICA Mission will begin feasibility study based on Case 3. Next CNAG meeting should be held before June 7th.

b. JICA Mission explained its concern for Boron in desalinated water and also explained that the dilution with groundwater would be a feasible solution using Annex-2. The GoCV understood the explanation although utilization of groundwater for dilution shall also be determined by CNAG.

c. JICA Mission will provide any information to GoCV regarding preliminary calculation of project cost and water tariff.

d. JICA Mission will, in its survey, propose commercial studies for the construction and operation of water supply facilities.

(design framework of the survey)

(6) JICA Mission proposed to the GoCV side the design framework of the Survey as in Annex-1. The GoCV will look into the framework and make comments by the next steering committee on June 7th.

(EIA procedures)

(7) With reference to the principle of the relevant law in Cape Verde and the JICA Guidelines, EIA report will be prepared and submitted by the GoCV based on the recommendations made by the Survey Team. The Survey team will examine environmental impact of the project through the Survey as level of Initial Environment Evaluation (IEE).

(End)

ANNEX-1	Second Steering Committee Presentation
ANNEX-2	Boron Removal
ANNEX-3	Attendants List of the Second Steering Committee
ANNEX-4	Main Points discussed

2nd Steering Committee on Water Supply System Development Project in Santiago, Cape Verde (JICA-II Project)

May 21, 2010 at Praia

Japan International Cooperation Agency

Toyo Engineering Corporation
Ingérosec Corporation
UNICO International Corporation

1. Opening Remarks
2. Purpose of Steering Committee
3. Progress Report (PR/R) Briefing
4. JICA Follow-up Study
5. Discussion
6. Closing Remarks

Purpose of Steering Committee:

1) to supervise the Survey and
2) to monitor the progress of the procedure inside GoCV.

Discussion Items in Steering Committee:

1) to identify the Project scope, project sites, specification of facilities, project cost, procurement structure, etc,
2) to set-up and establish the project implementation, operation and management organizations,
3) to establish financial structure, including tariff system, concession structure, staff allocations.

Purpose of JICA Study:

1) to verify the feasibility of the project
2) to find suitable project for Japanese yen and/or other fund credit.

Purpose of 2nd Steering Committee

1. Water supply system concept determination
2. Production Capacity proposed and discussed
3. Project scope confirmation
4. IEE/EIA cooperation
5. Water analysis and Geo-technical survey permission

for Interim Report (IT/R) submitted by the end of July.

1. Opening Remarks
2. Purpose of Steering Committee
3. Progress Report (PR/R) Briefing
4. JICA Follow-up Study
5. Discussion
6. Closing Remarks

Progress Report Major Contents

1. General Survey for Cape Verde and Santiago Island
2. Water Related Survey for Santiago Island
   - Operation and Management System and Organization
   - Water Supply and Distribution System
   - Assistance by donors
   - Socio-Economical Analysis
3. Water Supply System Study
   - Basic Conditions
   - Basic Planning
   - Project Recommendation
4. Environment and Social Consideration study

Progress Report Topics

1. Lack of water supply are confirmed for 370,000 people in Santiago, 2020.
2. Complicated management and organization are suggested.
3. Donors and private projects are individually realized and planned.
4. Willingness and Affordability to payment of 200-350 CVE/m^3 are expected, if ample water is supplied.

5. Water Supply System be studied.

(1) System Capacity Discussion

- Horizon of Demand in 2020: 35,800 m^3/day *as net demand horizon*
- Existing Desalination Capacity: 7,900 m^3/day *no change basis*
- Required Desalination Capacity: 27,900 m^3/day *as net basis*

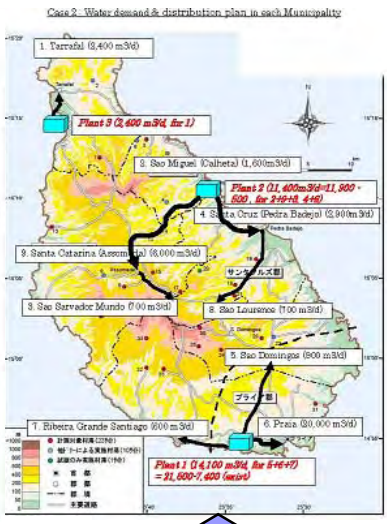
(2) Candidates System Configuration prepared

- JICA prepared 3 candidates, 1 centralized and 2de-centralized production.
- JICA recommends De-Centralized Production from major view points of Economics and Reliability.

3 Candidates be studied and discussed

Case 1

Case 2

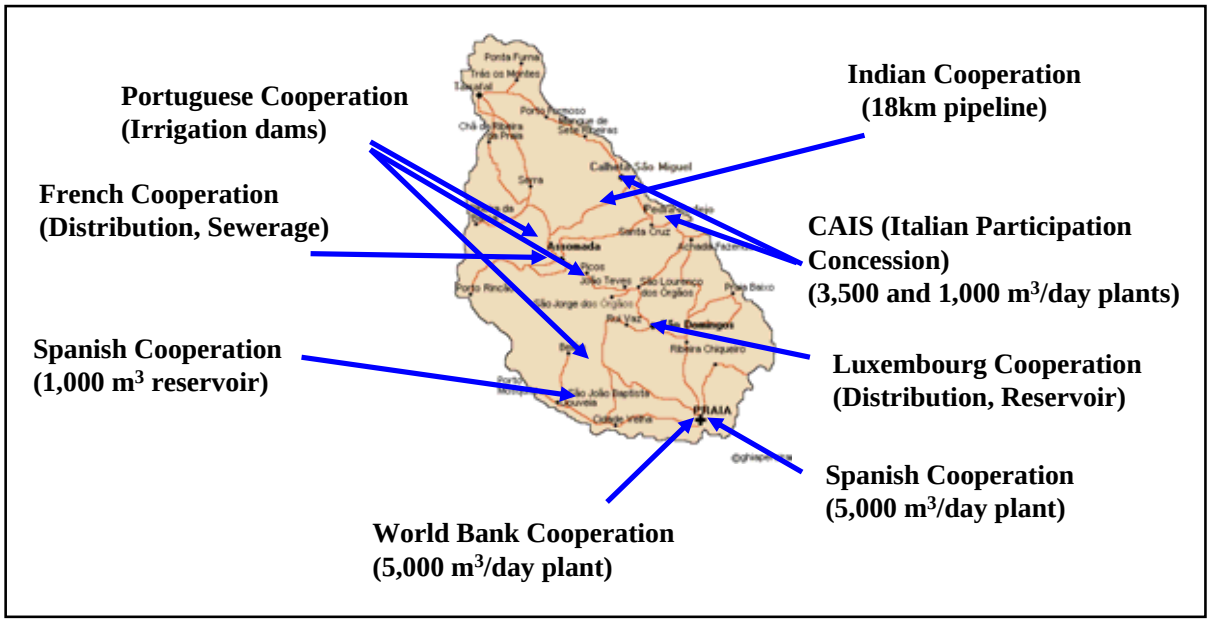


Case 3

Centralized Production

De-Centralized Production

Donor and Private Project on Santiago island



1. Opening Remarks
2. Purpose of Steering Committee
3. Progress Report (PR/R) Briefing
4. **JICA Follow-up Study**
5. Discussion
6. Closing Remarks

JICA Follow-up Study after Progress Report

1. JICA recommends De-Centralized water production system, while GoCV desires Centralized water production system.

2. JICA surveys Donor and private projects, which are individually planned, but those detail status are not disclosed.

3. JICA further studies the followings for the best option selection on PR/R basis;
   - preliminary construction cost estimation,
   - preliminary operation and maintenance cost estimation,
   - preliminary life cycle cost estimation, and
   - preliminary F-IRR (Financial Internal Rate of Return) calculation, and
   - those evaluation

Basic Assumption used for F-IRR Analysis

PRELIMINARY

- Design Stage: PR/R (Preparatory Design basis)
- Cost Estimation grade: Rough order of Magnitude
- Construction period: 2 years
- Sea water: free of charge and no special pretreatment required
- Power price: 0.388 US$/kWh (30 CVE/kWh equivalent)
- Labor Cost: 50,000 US$/year/one person
- F-IRR Analysis period: 20 years
- Non revenue water: zero
- *Major excluded items:*
  - *Power Plant for captive and emergency*
  - *Distributed control system and SCADA system*
  - *Land cost, purchase or lease*

Outcome of F-IRR Analysis

Preliminary for best option selection

Planned Population served		370,000		
Water Production System		Centralized	De-Centralized	
	unit	Case 1	Case 2	Case 3
Production Capacity and location	m^3/day	27,900	27,900	27,900
Praia		27,900	14,100	14,100
Tarrafal		-	2,400	2,400
Sao Miguel		-	11,400	8,300
Santa Cruz		-	-	3,100
No. of Desalination plants		one	three	four
Construction Cost (Base cost)	million US$	147	113	108
Dasalination Plant		33	49	53
others (Lines and Reservoir)		114	64	55
Project Cost	million US$	177	135	130
O&M cost	million US$/year	45	40	40
Life Cycle Cost for 20 years	million US$	1,045	904	901
Construction cost/population	US$/person	398	304	292
F-IRR at 3.3 US$/$m^3$ water	%	negative	negative	negative
F-IRR at 4.3 US$/$m^3$ water	%	negative	2.8	3.0

- 3.3 US$/$m^3$-water means Santiago average tariff
- 4.3 US$/$m^3$ -water means Praia city tariff

Donor and Private Project Survey

Project	Developer	System	Capacity	Location	Status
Donor	World Bank	Desalination Plant	5,000 m^3/day	Praia	2012
	AfDB	rain water collection		entire island	study
	EC/OFID	Distribution Network			
	Spain	Desalination Plant	5,000 m^3/day	Praia	2010
		Reservoir	5,000 m^3	Cidade Velha	completed
	Portugal	Irrigation dams			2010
	China	Irrigation dam			completed
	Japan/JICA	Wells		entire island	on-going
	India	Pipeline	18 km	Sao Miguel to Assomada	2011
	France	Distribution Sewerage	521 m^3/day	Santa Catarina	2010
	Luxembourg	Distribution Reservoir			
Private	CAIS	Desalination Plant	3,500 m^3/day	Sao Miguel	on-going
		Desalination Plant	1,000 m^3/day	Pedra Bajero	on-going

Only Desalination Plants by World Bank and Spain were fixed, and will be integrated with further JICA Study.

JICA Recommendation as follow-up study

JICA recommends Case-3 with some modification due to

- **Project economics**
- **Water supply reliability**
- **Project materialization and flexibility**

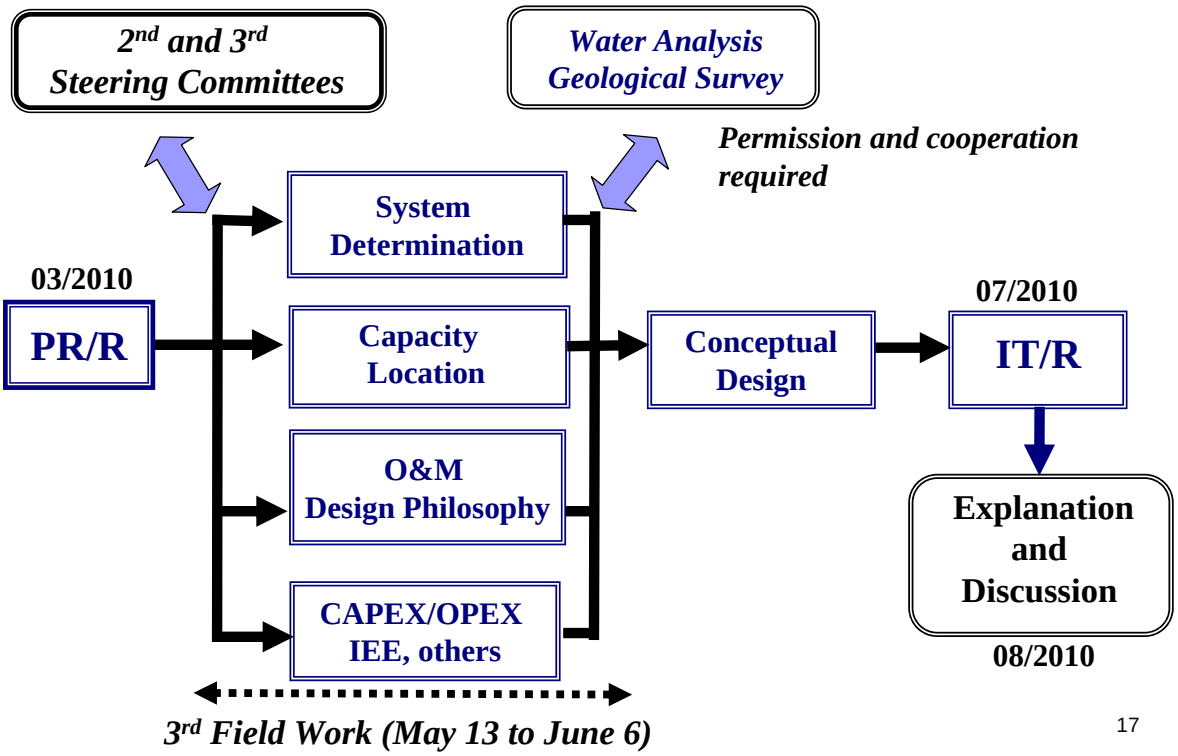
JICA takes notes of the GoCV concerns such as
- proximity of existing desalination plant in Praia,
- tourism development in Santiago island, and
- operation & maintenance concern in local municipalities.

Time Schedule of JICA Study

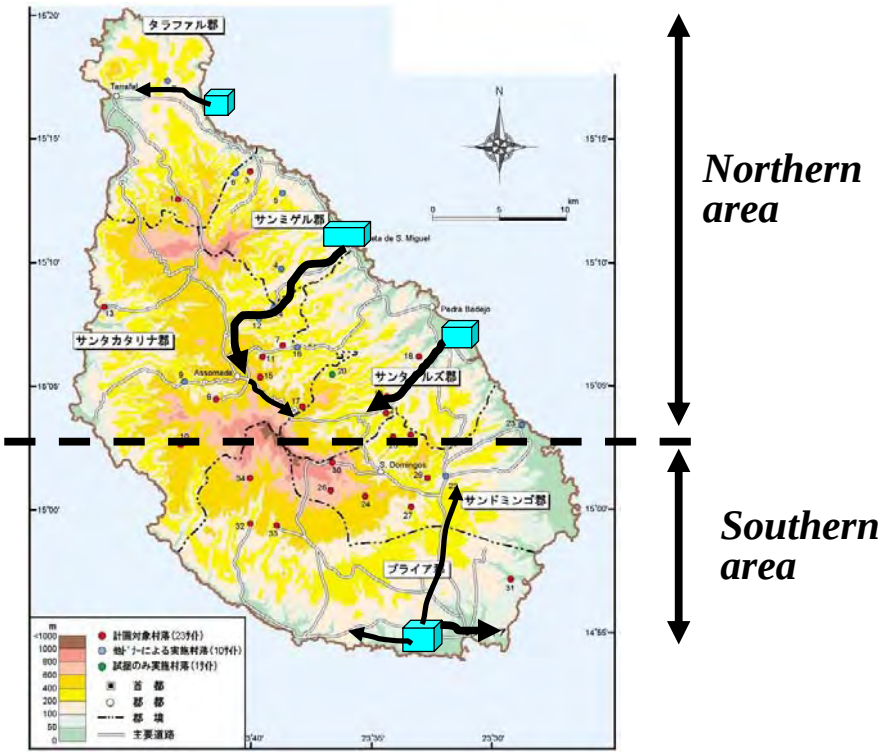
Year		2009			2010											2011					
Month		10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6
		Phase 1						Phase 2														
Field Work		1st			2nd				3rd			4th			5th							
Submission of JICA Report		IC/R					PR/R				IT/R			DF/R		F/R						
Steering Committee						☆			☆	☆		☆			☆							
Local Consultant			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.

Study Flow for IT/R



System Determination proposed



Capacity as basic design frame work proposed

			South			Total South	North						Total North	Grand Total
			Praia	Ribeira Grande	Sao Domingos		Tarrafal	Sao Miguel	SS do Mundo	Santa Cruz	Sao Lourenco	Santa Catarina		
(a)		Target Year (2020) Population	177,718	9,572	15,542	202,832	31,637	19,110	13,013	35,617	10,986	57,369	167,732	370,564
	a-1	Urban	177,007	1,522	2,891	181,420	11,041	7,204	1,835	15,743	2,318	23,751	61,892	243,312
	a-2	Rural	711	8,050	12,651	21,412	20,596	11,906	11,178	19,874	8,668	33,618	105,840	127,252
(b)		Service Coverage (%)	100	100	100	100	100	100	100	100	100	100	100	100
(c)		Served Population	177,718	9,572	15,542	202,832	31,637	19,110	13,013	35,617	10,986	57,369	167,732	370,564
	c-1	Urban	177,007	1,522	2,891	181,420	11,041	7,204	1,835	15,743	2,318	23,751	61,892	243,312
	c-2	Rural	711	8,050	12,651	21,412	20,596	11,906	11,178	19,874	8,668	33,618	105,840	127,252
(d)		Per-Capita Demand (LCD)												
	d-1	Urban	100	100	100	100	100	100	100	100	100	100	100	100
	d-2	Rural	50	50	50	50	50	50	50	50	50	50	50	50
(e)		Domestic Demand (m^3/day)	17,736	555	922	19,213	2,134	1,316	742	2,568	665	4,056	11,481	30,694
	e-1	Urban	17,701	152	289	18,142	1,104	720	184	1,574	232	2,375	6,189	24,331
	e-2	Rural	36	403	633	1,071	1,030	595	559	994	433	1,681	5,292	6,363
(f)		Non-Domestic Demand (m^3/day	2,100	0	0	2,100	250	200	0	300	0	1,800	2,550	4,650
	f-1	Tourizm Demand	600	0	0	600	50	100	0	100	0	300	550	1,150
	f-1-1	Number of Tourists (Daily)	2400	0	0	2,400	200	400	0	400	0	1200	2,200	4,600
	f-1-2	Per-Capita Demand (LCD)	250	0	0	250	250	250	0	250	0	250	1,000	1,250
	f-2	Others	1500	0	0	1,500	200	100	0	200	0	1500	2,000	3,500
(g)		Net Water Demand (m^3/day)	19,836	555	922	21,313	2,384	1,516	742	2,868	665	5,856	14,031	35,344
(h)		Leakage Ratio (%)	24	20	10	23	24	16	20	28	10	28	25	24
(i)		Day Average Demand (m^3/day)	26,100	693	1,020	27,813	3,137	1,804	928	3,983	736	8,133	18,722	46,535
(j)		Seasonal Peak Factor	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
(k)		Day Maximum Demand (m^3/day)	33,930	901	1,325	36,157	4,078	2,346	1,206	5,178	957	10,573	24,338	60,495
						60%							40%	100%

- **Leakage ratio and Seasonal peak factor should be carefully discussed.**
- **Suggested water tariff might be 5.6-6.7 US$/$m^3$, equivalent 430-500 CVE/m^3 on expected F-IRR=5%.**

JICA Study Scope confirmation-1

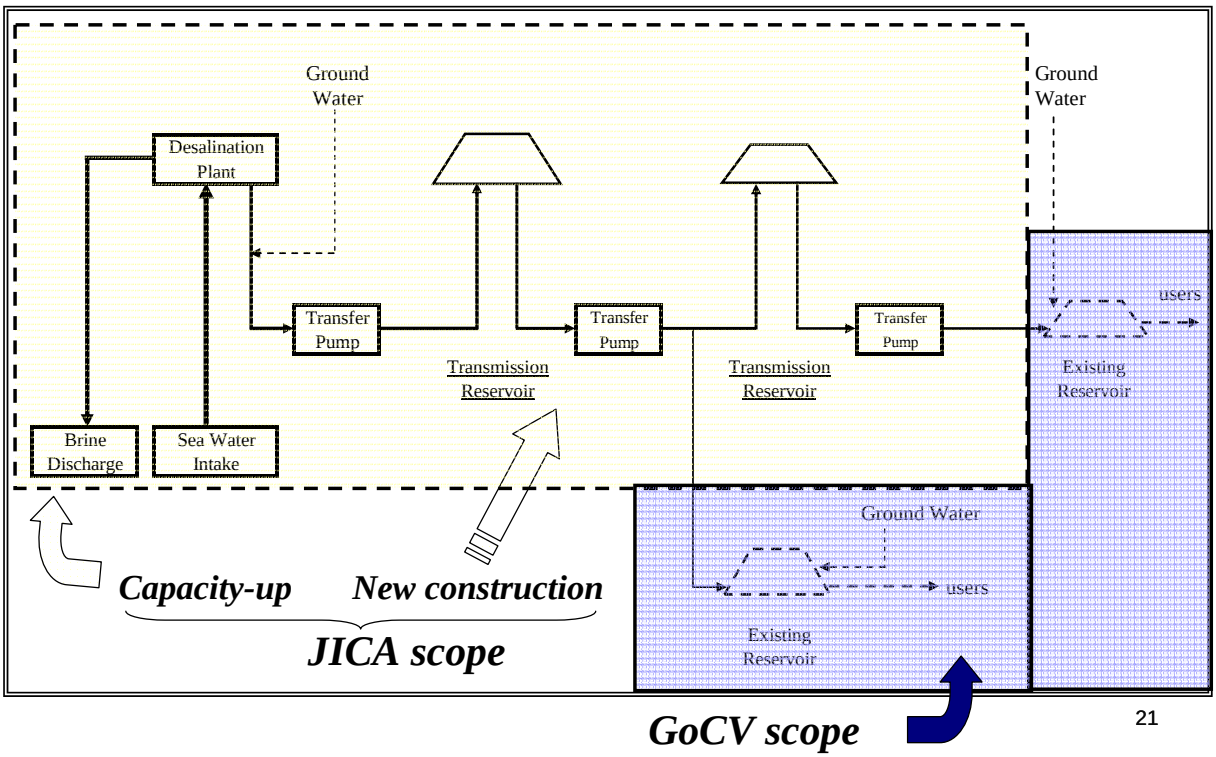
Project Area:
Major urban areas and their surroundings of each municipality, including Praia city in Santiago island.

Scope of Study:

Component	summary
Desalination Plants	**new construction**
Transmission Pipe Line	**new construction from each desalination Plant to municipalities**
Reservoirs, Pump Stations, Main-sub station, Monitoring, etc.	**new construction**
Consulting Services	**Planning and Detail Design, Bidding Assistance Construction Supervision, Initial Operation EIA Supervision**

Notes: Facilities and equipments for house connection from the distribution pipe to the meter of each household will be excluded to the Project Scope.

JICA Study Scope confirmation-2



IEE and EIA

■ Schedule

(*In the case of "Category B" under JBIC Guideline)

		2010									2011				
		4	5	6	7	8	9	10	11	12	1	2	3	4	5
JICA Study	Initial Environment Evaluation(IEE)														
GoCV	To prepare TOR and Bid-documents for procurement of EIA consultant														
	Qualification, Evaluation and Selection of EIA consultant														
	To conduct EIA Study														
	Approval by GoCV														
Submission of JICA Reports					IT/R			DF/R		F/R					

Legend: Study Mission in Cape Verde
IC/R : Inception Report, PR/R: Progress Report, IT/R : Interim Report, DF/R : Draft Final

IEE and EIA

■ EIA conducted by GoCV

GoCV is responsible for:	Time Frame of EIA	Remarks
1. **Mobilization of the budget for EIA procedure.** 2. **Preparation of the TORs for procurement of the EIA consultants.** 3. **Selection of EIA consultants.** 4. **Quality of EIA study.** 5. **Authorization of EIA report.** 6. **Monitoring during construction and operation according to parameters established in the EIA report.**	1. **End of July 2010: JICA Study team will provide IT/R including the result of IEE.** 2. **from August 2010 to April 2011 (9 months): GoCV shall conduct EIA Study and authorize EIA report.**	➢ EIA shall cover all the affected areas and/or municipalities due to the Project. ➢ EIA shall only be aligned environmental law in Cape Verde, if the Project will be categorized "B" by JICA. ➢ EIA report should be submitted to JICA **before the appraisal** of the Project. ➢ The timing of the appraisal shall be discussed with JICA.

23

1. Opening Remarks
2. Purpose of Steering Committee
3. Progress Report (PR/R) Briefing
4. JICA Follow-up Study
5. Discussion
6. Closing Remarks

Anexo 1-4

Minutes of Meeting (3rd Steering Committee)

&

Discussion materials

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

DATE: June 7, 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 third time on the 7th of June 2010, in the office of Cape Verde Investment Agency, Praia, Cape Verde. The list of participants is given in ANNEX-2.
7. The main points discussed are based on the presentation by The JICA study team of all results and propositions related to the project at the time of the meeting. This presentation is given in ANNEX-1.
8. The Project Steering Committee members hereby confirmed full understanding of main points discussed as per hereto the Attachment of the Minutes of Meeting.

By Chairman of the Project Steering Committee

Mr. Abraao Andrade LOPES
Director General,
Ministry of Tourism, Industry and Energy
Cape Verde

MS

MINUTES OF MEETING
ON
DESIGN CONDITION DEFINITION
FOR
THE PREPARATORY SURVEY
ON
WATER SUPPLY SYSTEM DEVELOPMENT PROJECT
IN
THE REPUBLIC OF CAPE VERDE

Praia, June 7, 2010

Mr. Abraao Andrade LOPES
Director General,
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 its arrival on May 17th, 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 Progress 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 Mission will proceed as planned up to December 2010, when the Survey comes to the end.

1. Conditions of the Survey in general
   The JICA Survey Team 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. Major Points Discussed

(Activities of other donors and firms)

(1) As for the activities of other donors and firms the GoCV explained and confirmed the below.
   a. The Survey shall include financial cooperation of Spain (5,000m^3/day) and of World Bank (5,000m^3/day) to expand the existing desalination plant at Palmarejo in Praia.
   b. The concession contract between GoCV and CAIS is still under discussion. Therefore, the Survey does not need to include CAIS projects to construct desalination plants in Sao Miguel and Santa Cruz.
   c. The Survey shall take note of the construction plan of water transmission line from Calheta de Sao Miguel to Assomada, which was already planned by GoCV.

(Outcomes of the 3rd mission by JICA Survey Team and Design Framework)

(2) As for the Survey conducted by during the 3rd mission, JICA Survey Team explained and all the participants of Steering Committee accepted the below.
   a. JICA Survey Team has conducted the actual Survey based on the option proposed by the internal steering committee held on April 28th and the discussion and result of the 2nd Steering Committee held on May 21st, 2010.
   b. JICA Survey Team reached the conclusion of the most optimal solution through development of survey including cost analysis, which is to produce desalinated water by 2 major plants located within the premises of ELECTRA at Palmarejo and at the proposed site of Calheta de Sao Miguel, each of them having a production capacity of 20,000 m^3/day of desalinated water at Horizon 2020, and to transport produced desalinated water with inter-municipality transmission network.
   c. JICA survey team has presented the revised prospective evaluation of water demand in 2020 The JICA Survey Team has actualized the data through the meeting with concerned authorities and institutions of GoCV such as MTIE, INE, INGRH, ELECTRA, etc. for the basic plan and feasibility study.

MS

d. All participants of the present Steering Committee explained their opinion concerning the revised prospective evaluation of water demand, whose subjects are mainly; 1) household connection ratio target in 2020, 2) leakage ratio target in 2020 of their municipalities in order to finalize the prospective evaluation by JICA Survey Team. Thus all participants of the present Steering Committee confirmed the result of calculation as described in the ANNEX-3 Design Framework, and agreed to start the system design by JICA Survey Team.
e. JICA Survey Team summarized the design philosophy. In order to follow the agreed initial schedule of feasibility study to be conducted by the JICA Survey Team, the design framework, comprising basic data for water demand volume and design philosophy, discussed by the members of 3rd Steering Committee should not be altered from this date.
f. GoCV side has shared necessary information, changes and results regarding water supply in the country with the JICA Survey Team. Therefore, it shall be considered that the design framework for the Feasibility Study, attached as ANNEX-3 Design Framework, is accepted by GoCV.

(CNAG Meeting – Ground water and Boron Issues)

(3) Although the conclusion needs to be determined officially by CNAG in the GoCV level for ground water mixture and boron issues, JICA Survey Team will start the system design in Japan based on the agreed design framework with basic data and design philosophy by the 3rd Steering Committee.
   a. JICA Survey Team met and explained and discussed on 3rd of June, 2010 with Ministers of GoCV during the 3rd Mission, Ms. Fátima FIALHO - Honorable Minister of Tourism, Industry and Energy, Ms. Cristina DUARTE - Honorable Minister of Finance, Mr. Jose Maria VEIGA Honorable - Minister of Environment Rural Development and Maritime Resources, though CNAG Meeting was not possible to be held before the present 3rd Steering Committee.
   b. Though GoCV's principal policy of Ground water utilization is orientated to solely agricultural purpose, it shall be utilized for potable water unless the sufficient volume of potable water is supplied to users of each Municipality in Santiago Island. JICA Survey Team will not take into consideration the actual quantity of ground water used for potable water.
   c. The Ministers recommended to follow EU standard concerning Boron content of drinking water as there is not CV standard. This subject is to be officially reported to JICA Headquarter and JICA Survey Team when GoCV decides this issue by the Ministry in charge.

(IEE Workshop)

(4) Inter-Municipal Meeting for Environmental Issues was conducted and invited MTIE, DGA, and Chambers of Municipality on 25th of May, 2010 in Praia. Output and Confirmed items are also shown in ANNEX-4.

(Municipality Mayors Workshop)

(5) Mayors Workshop was conducted and invited Mayors of all municipalities of Santiago island on 31st of May, 2010 for introduction of the JICA Study and its objectives using ANNEX-5. All participants understood the JICA Study.

(Fourth Steering Committee)

(6) JICA Survey Team proposed the 4th Steering Committee after the submission of Interim Report (IT/R) of Feasibility Study to be held around August 2010.

(End)

ANNEX-1	Third Steering Committee Presentation
ANNEX-2	Attendants List of the Second Steering Committee
ANNEX-3	Design Framework
ANNEX-4	IEE Workshop
ANNEX-5	Municipality Mayors Workshop

3rd Steering Committee
on
Water Supply System
Development Project in Santiago, Cape Verde
(JICA-II Project)

June 7, 2010 at Praia

Japan International Cooperation Agency

Toyo Engineering Corporation
Ingérosec Corporation
UNICO International Corporation

Topics and Modification after 2nd Committee

1. **Critical Issues**
2. **Project Work Shop**
3. **IEE Work Shop**
4. **Modification after 2nd Steering Committee**
   - **4-1. Water Demand and Frame Work**
   - **4-2. System Development Approach**
   - **4-3. Water Supply System**
   - **4-4. Cost Comparison**
5. **Ground Water utilization and Boron content**
6. **Basic Data and Design Philosophy**
7. **Way Forward to Interim Report**

Critical Issues

- **To solve the critical issues of the JICA project attending**
  - Minister of Tourism, Industry and Energy
  - Minister of Finance
  - Minister of Environment Rural Development and Maritime Resources
  with JICA Study Team on 3rd June, 2010 in Praia.

- **Solution of Critical issues:**

1. **Desalination will be installed at Calheta Sao Miguel and Palmarejo with inter-municipality network.**
2. **Other projects, which are considered regarding JICA Study,**
   - Spanish cooperation project (5,000m^3/day desalination expansion), and
   - World Bank cooperation project (5,000m^3/day newly installed).
3. **Ground water will not be utilized for potable after JICA project completion.**
4. **Boron content in potable water will follow to EU standard of less than 1.0mg/l.**

Project Work Shop

The work shop was conducted inviting MTIE, INGRH, and Camara Municipals on 31st May, 2010 in Praia.

- **Topics:**

1. **JICA Study, its objective, time schedule, and methodology**
2. **Water demand estimation with population horizon in Santiago island**
3. **Water supply system with layout, production, reservoir, and transmission**
4. **Scope of JICA and GoCV**

- **Discussion Items:**

1. **System development approach was confirmed.**
2. **Ground water utilization and Boron removal were discussed.**
3. **Main reservoir capacity was discussed.**
4. **Holding company idea in Santiago island was discussed.**
5. **Production cost and tariff were discussed.**

IEE Work Shop

- **Output:**

1. **Inter-Municipal Meeting for Environmental Issues was conducted inviting MTIE, DGA, and Camara Municipals on 25th May, 2010 in Praia.**
2. **Subjects discussed:**
   1) **Definition of category of JBIC guideline**
   2) **EIA mandate based on category.**
   3) **General issues to be considered in each municipality for formulation of Project**
   4) **Forthcoming EIA study**

- **Confirmed Items:**

1. **JICA will categorize the Project based on IEE.**
2. **Each Municipality Environment Plan shall be considered as the opinion of local stakeholders for F/S and IEE stage.**
3. **GoCV will prepare TORs for EIA based on recommendation of IEE.**

---

1. **Critical Issues**
2. **Project Work Shop**
3. **IEE Work Shop**
4. **Modification after 2nd Steering Committee**
   - **4-1. Water Demand and Frame Work**
   - **4-2. System Development Approach**
   - **4-3. Water Supply System**
   - **4-4. Cost Comparison**
5. **Ground Water utilization and Boron content**
6. **Basic Data and Design Philosophy**
7. **Way Forward to Interim Report**

Demand and Frame work at 2nd Committee

			South			Total South	North						Total North	Grand Total
			Praia	Ribeira Grande	Sao Domingos		Tarrafal	Sao Miguel	SS do Mundo	Santa Cruz	Sao Lourenco	Santa Catarina		
(a)		Target Year (2020) Population	177,718	9,572	15,542	202,832	31,637	19,110	13,013	35,617	10,986	57,369	167,732	370,564
	a-1	Urban	177,007	1,522	2,891	181,420	11,041	7,204	1,835	15,743	2,318	23,751	61,892	243,312
	a-2	Rural	711	8,050	12,651	21,412	20,596	11,906	11,178	19,874	8,668	33,618	105,840	127,252
(b)		Service Coverage (%)	100	100	100	100	100	100	100	100	100	100	100	100
(c)		Served Population	177,718	9,572	15,542	202,832	31,637	19,110	13,013	35,617	10,986	57,369	167,732	370,564
	c-1	Urban	177,007	1,522	2,891	181,420	11,041	7,204	1,835	15,743	2,318	23,751	61,892	243,312
	c-2	Rural	711	8,050	12,651	21,412	20,596	11,906	11,178	19,874	8,668	33,618	105,840	127,252
(d)		Per-Capita Demand (LCD)												
	d-1	Urban	100	100	100	100	100	100	100	100	100	100	100	100
	d-2	Rural	50	50	50	50	50	50	50	50	50	50	50	50
(e)		Domestic Demand (m^3/day)	17,736	555	922	19,213	2,134	1,316	742	2,568	665	4,056	11,481	30,694
	e-1	Urban	17,701	152	289	18,142	1,104	720	184	1,574	232	2,375	6,189	24,331
	e-2	Rural	36	403	633	1,071	1,030	595	559	994	433	1,681	5,292	6,363
(f)		Non-Domestic Demand (m^3/day	2,100	0	0	2,100	250	200	0	300	0	1,800	2,550	4,650
	f-1	Tourizm Demand	600	0	0	600	50	100	0	100	0	300	550	1,150
	f-1-1	Number of Tourists (Daily)	2400	0	0	2,400	200	400	0	400	0	1200	2,200	4,600
	f-1-2	Per-Capita Demand (LCD)	250	0	0	250	250	250	0	250	0	250	1,000	1,250
	f-2	Others	1500	0	0	1,500	200	100	0	200	0	1500	2,000	3,500
(g)		Net Water Demand (m^3/day)	19,836	555	922	21,313	2,384	1,516	742	2,868	665	5,856	14,031	35,344
(h)		Leakage Ratio (%)	24	20	10	23	24	16	20	28	10	28	25	24
(i)		Day Average Demand (m^3/day)	26,100	693	1,020	27,813	3,137	1,804	928	3,983	736	8,133	18,722	46,535
(j)		Seasonal Peak Factor	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
(k)		Day Maximum Demand (m^3/day)	33,930	901	1,325	36,157	4,078	2,346	1,206	5,178	957	10,573	24,338	60,495
						60%							40%	100%

Estimated daily maximum demand: 60,000m³/day.
- Northern area is 24,000m³/day (40% of island), and
- Southern area is 36,000m³/day (60% of island).

Demand and Frame work modified

items		South			South total	North						North total	Total	[illegible]
		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	Instituto 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,[illegible]	INE
b. Overall Pipeline Service Coverage (%)		99.0%	80.0%	80.0%		90.0%	75.0%	60.0%	80.0%	85.0%	70.0%			Study team
in 2007		47.3%	10.9%	9.9%		54.1%	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	9,250	13,865	179,513	25,719	15,853	7,894	46,657	30,687	7,808	134,618	314,130	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	7,504	11,093	19,386	16,002	8,455	6,118	27,994	16,246	5,577	80,392	99,777	Connection ratio (Rural Total)
c4 = a-c1	Overall population, NOT served by pipe	1,580	2,312	3,466	7,358	2,858	5,284	5,263	11,664	5,415	3,346	33,830	41,189	71%
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	2,312	3,466	7,358	2,858	5,284	5,263	11,664	5,415	3,346	33,830	41,189	
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	[illegible]	2799	2166	335	8,134	32,153	
e2 = c3 x d2	– Rural, with pipe connection	63	600	887	1,551	1280	676	489	2240	1300	446	6,431	7,982	
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	116	173	368	143	[illegible]	263	583	271	167	1,692	2,059	
A. = e1+e2+e3+e4	Domestic Demand (m3/day)	23,483	978	1,477	25,938	2,6[illegible]	2,050	1,019	5,622	3,737	948	16,257	42,195	
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 Ocuppancy	70%	70%	70%		70%	70%	70%	70%	70%	70%			Study team
f3	Per-Capita Demand (liter/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	0	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	99[illegible]	1,548	29,534	2,973	2,171	1,019	6,227	3,879	948	17,217	46,751	
h.	Leakage Ratio (%)	[illegible]	10	0		0	10	10	15	15	0		10	Study team
NOW		[illegible]	20	10		24	16	20	28	28	10		24	SAAS
D = C /(100% - h%)	Day Average Demand (m3/day)	31,750	1,175	1,682	34,607	3,497	2,413	1,199	7,326	4,563	1,031	20,028	54,635	
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/d)	237	10	9	256	20	9	0	49	20	0	98	354	
E = D + j	Daily Maximum Demand (m3/day)	31,987	1,185	1,691	34,863	3,517	2,422	1,199	7,375	4,583	1,031	20,126	**54,990**	
		58%	2%	3%	63%	6%	4%	2%	13%	8%	2%	37%	100%	

2. Existing plant, including planned plant

Existing Desalinat[illegible] plant	5,000	(Palmarejo)	5,000					500		500	5,500
Planned plan[illegible]								(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							500	**15,500**

3. Necessary [illegible]onal plant (1-2)

Detail figure (m3/d)			19,863							19,626	39,490
Round figure (m3/d)			**20,000**							**20,000**	**40,000**

Estimated daily maximum demand: 55,000m³/day.
- Northern area is 20,000m³/day (36% of island), and
- Southern area is 35,000m³/day (64% of island).

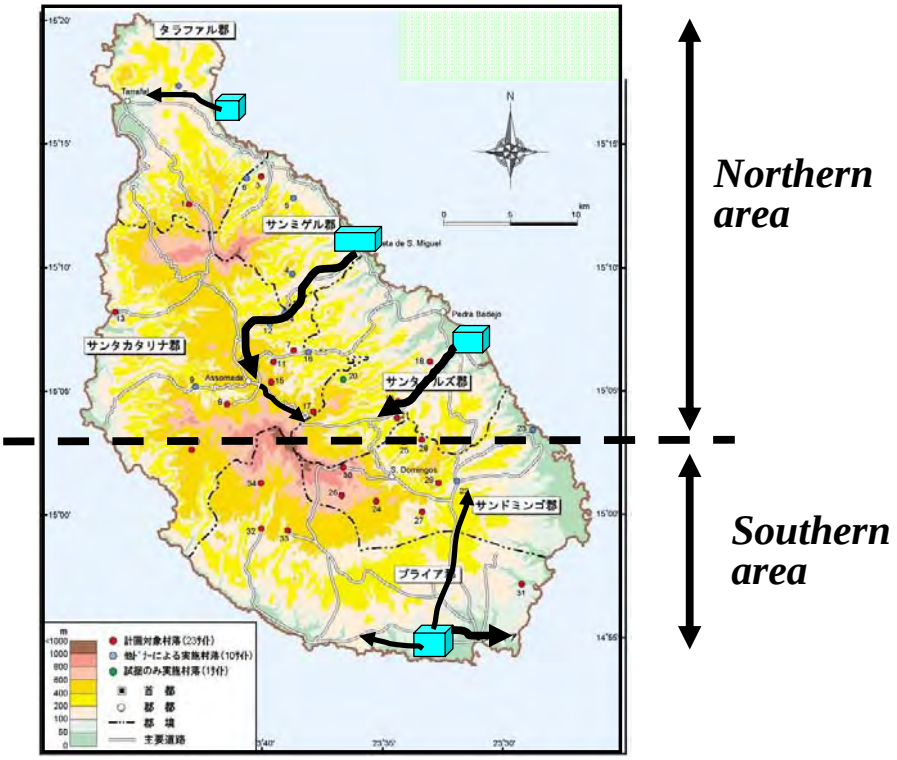
System Development Approach modification

- Served population and its distribution
- Natural condition and Power supply condition
- Construction cost and operation cost
- O & M system and organization
- Environment and social consideration

- *Other project impacts of Spanish, WB, and CAIS*
- *Inter-municipality network*

were added during this field survey in Cape Verde

Proposed System at 2nd Steering Committee



Modified System

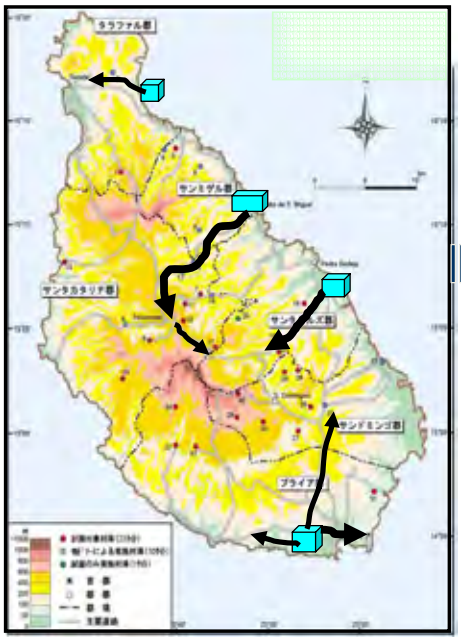
Altitude levels are indicative
Pumps location and reservoirs locations are indicative

- transmission mains
- transmission mains
- transmission mains
- pumping station
- existing and planned desalination plants
- JICA dessalination plant
- Existing reservoir
- JICA reservoir
- JICA reservoir

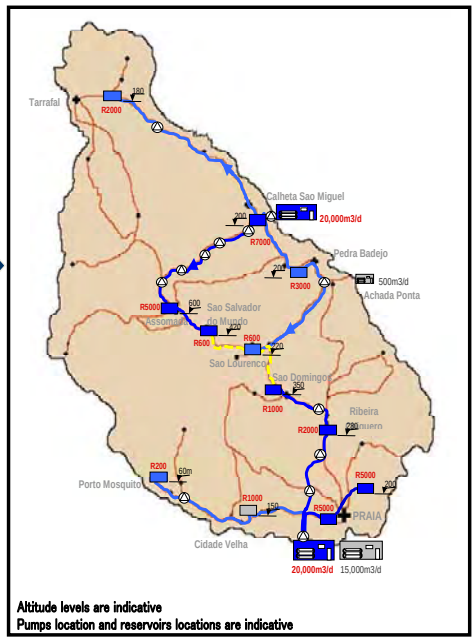
1. **Two desalination system will be installed at Palmarejo and Calheta Sao Miguel.**
2. **Palmarejo Capacity:**
   Total Production 35,000m³/day
   <u>Existing and fixed plan 15,000m³/day</u>
   JICA plan 20,000m³/day
3. **Calheta Capacity: 20,000m³/day**
4. **Desalinated water will be supplied to all communities by transmission line to reservoirs.**

System Modification after 2nd Steering Committee

before

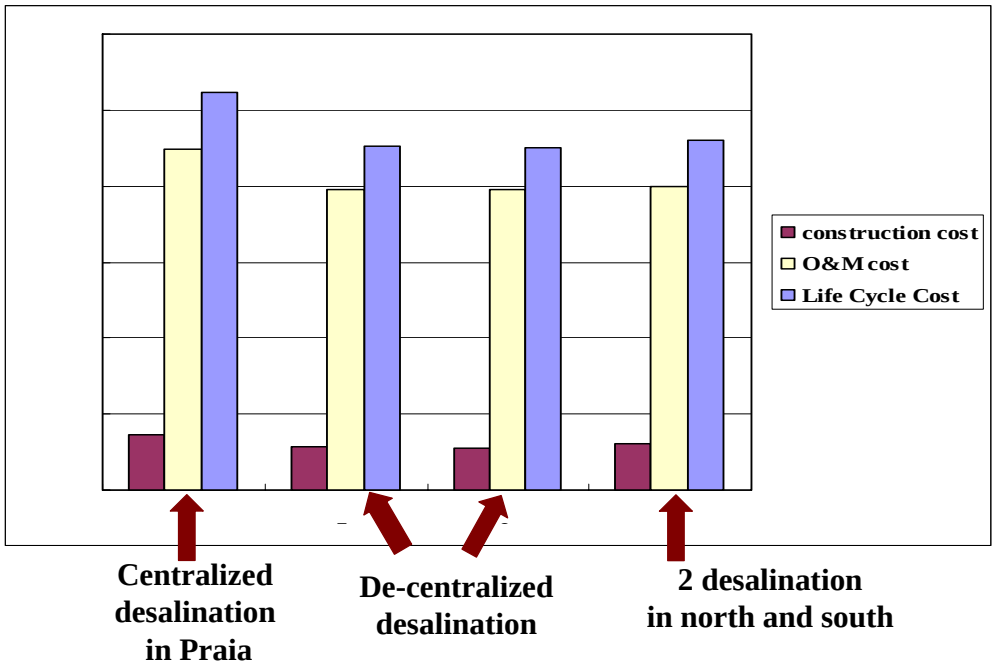


after



Altitude levels are indicative
Pumps location and reservoirs locations are indicative

Cost comparison of 3 + 1 cases on PR/R basis



1. Critical Issues
2. Project Work Shop
3. IEE Work Shop
4. Modification after 2nd Steering Committee
   - 4-1. Water Demand and Frame Work
   - 4-2. System Development Approach
   - 4-3. Water Supply System
   - 4-4. Cost Comparison
5. Ground Water utilization and Boron content
6. Basic Data and Design Philosophy
7. Way Forward to Interim Report

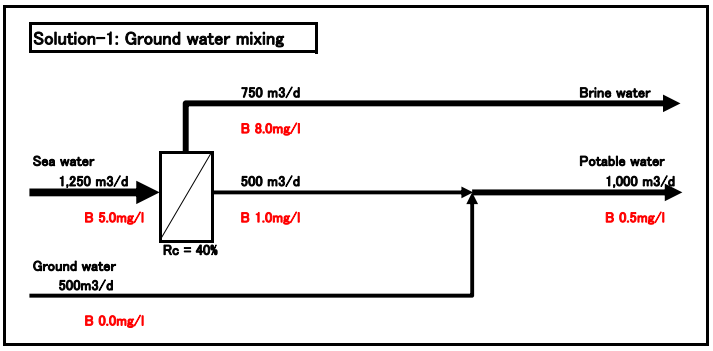
Ground Water Utilization issues

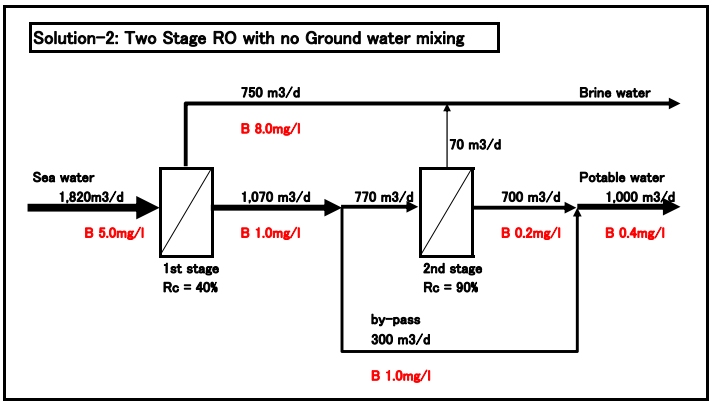
- **Major Advantage:**
  - Desalination capacity reduction
  - Water tariff reduction
  - Boron content reduction

- **Major Disadvantage:**
  - Unstable supply
  - Unstable quality
  - Lack of irrigation water

- **GoCV Policy**

Boron Removal Solution for WHO guideline





WHO: <0.5mg/l
EU: <1.0mg/l
Japan: <1.0mg/l

View points of
- **GW availability**
- **GW utilization policy**
- **Boron content of EU/JPN**

EU standard might follow.

Basic Data for Design

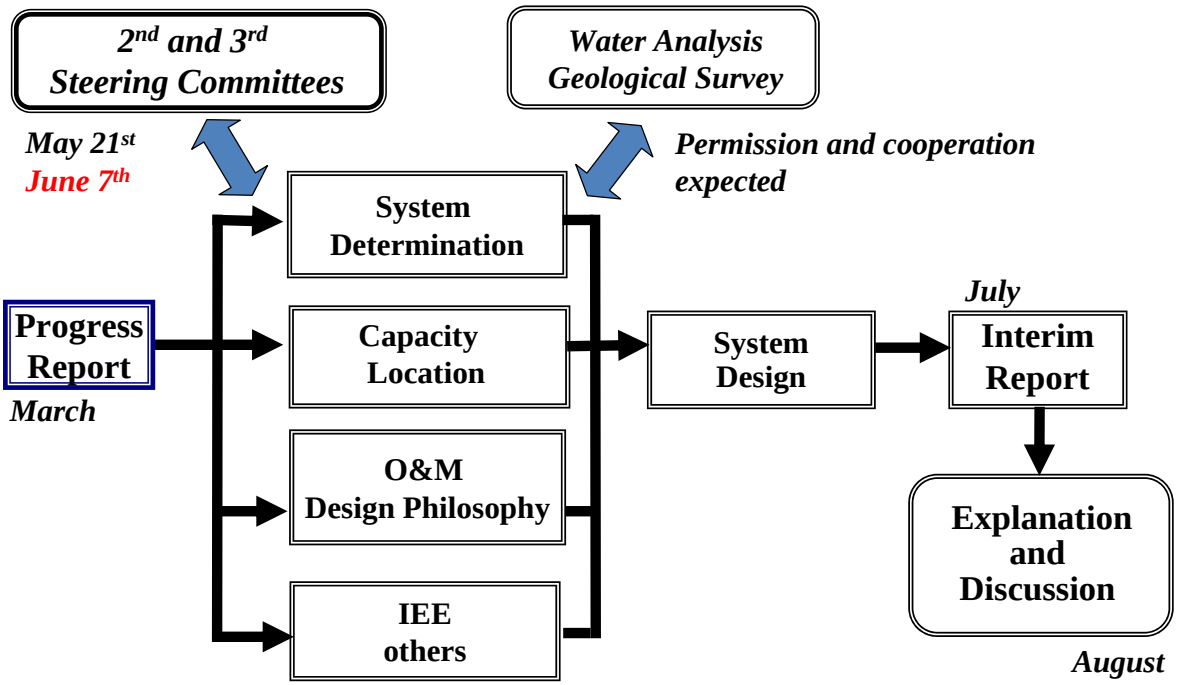
1.	Unit of Measurement	SI (International System)
2.	Code and Standard	ISO, EN and/or JIS
3.	Sea water specification	To be identified (*)
4.	Product water specification	EU standard
5.	Effluent information	To be identified
6.	Ground water specification	To be identified (*)
7.	Soil information	To be identified (*)
8.	Supplied power	Medium voltage, 20/15/10/6kV

(*) : under analysis

Design Philosophy

1.	Desalination Technology	Reverse Osmosis
2.	Power source	Electric power purchased
3.	Major pumps	50% spare
4.	Reservoir capacity	1/2 day for consumer 1/3 day for production
5.	Instrumentation	Flow control for pumping Level control for reservoir
6.	Disinfection system	Chlorination
7.	Major monitoring	pH, Cl^-, Conductivity

Way forward to Interim Report



Interim Report contents

- Water supply system specification
- Each desalination plant specification
- Each reservoir specification
- Transmission network specification with pumping
- Preparation of project financial analysis
- IEE result
- EIA study preparation
- Sea Water and Ground Water Analysis
- Soil Analysis

Thank you and Obrigado