参　考　資　料

参考資料 １

一般資料

[資　料]

1. 調査団員・氏名

（1）基本設計調査			
氏　　名	担　　当	所　　属	期　　間
三浦　和紀	総括	JICA 無償資金協力部管理課	2002/07/30-08/07
浅川　浩彦	技術参与	大阪府水道部事業管理室 事業管理課主査	2002/07/30-08/07
田中　紀子	無償資金協力	外務省経済協力局 無償資金協力課	2002/07/30-08/04
佐藤　公平	計画管理	JICA 無償資金協力部 業務第一課	2002/07/30-08/07
美和　彧男	業務主任	㈱ｴﾇｼﾞｪｰｴｽ・ｺﾝｻﾙﾀﾝﾂ	2002/07/30-09/11
澤井　茂雄	給水計画	㈱ｴﾇｼﾞｪｰｴｽ・ｺﾝｻﾙﾀﾝﾂ	2002/07/30-09/11
木口　孝文	自然条件調査	㈱ｴﾇｼﾞｪｰｴｽ・ｺﾝｻﾙﾀﾝﾂ	2002/07/30-08/27
渡部　隆	施設計画	㈱ｴﾇｼﾞｪｰｴｽ・ｺﾝｻﾙﾀﾝﾂ	2002/07/30-09/11
藤原　廣輝	設備設計	㈱ｴﾇｼﾞｪｰｴｽ・ｺﾝｻﾙﾀﾝﾂ	2002/08/14-09/11
末武　透	事業運営計画	㈱ｴﾇｼﾞｪｰｴｽ・ｺﾝｻﾙﾀﾝﾂ	2002/08/14-09/11
落合　孝男	施工調達計画／積算	㈱ｴﾇｼﾞｪｰｴｽ・ｺﾝｻﾙﾀﾝﾂ	2002/08/14-09/11
三浦　輝	業務調整	㈱ｴﾇｼﾞｪｰｴｽ・ｺﾝｻﾙﾀﾝﾂ	2002/08/14-09/11
（2）報告書説明協議			
佐藤　公平	総括	JICA 無償資金協力部 業務第一課	2002/11/04-11/15
美和　彧男	業務主任	㈱ｴﾇｼﾞｪｰｴｽ・ｺﾝｻﾙﾀﾝﾂ	2002/11/04-11/15
澤井　茂雄	給水計画	㈱ｴﾇｼﾞｪｰｴｽ・ｺﾝｻﾙﾀﾝﾂ	2002/11/04-11/15
渡部　隆	施設計画	㈱ｴﾇｼﾞｪｰｴｽ・ｺﾝｻﾙﾀﾝﾂ	2002/11/04-11/15

2．調査行程

（1）基本設計調査

No.	日付		宿泊地	行　動			
				三浦、浅川、田中、佐藤	美和、木口	澤井、渡部	藤原、末武、落合、三浦
1	07/29	月	コロンボ	成田発			
2	07/30	火	コロンボ	コロンボ着			
				大使館、JICA、住宅公共事業省表敬訪問・協議			
3	07/31	水	ゴール	NWS&DBと協議、政策開発実施省表敬訪問、マータラへ移動			
4	08/01	木	マータラ	NWS&DB南部事務所と協議、現地調査			
5	08/02	金	マータラ	現地調査			
6	08/03	土	コロンボ	コロンボに移動		現地調査	
7	08/04	日	コロンボ	調査団内打合せ		休日	
				田中団員コロンボ発			
8	08/05	月	コロンボ	NWS&DBと協議		現地調査、資料収集	
9	08/06	火	マータラ	M/Dに署名、大使館・JICAへ報告		現地調査、資料収集	
					マータラに移動		
10	08/07	水	マータラ	コロンボ発	現地調査（取水場）		
11	08/08	木	マータラ		資料収集、整理		
12	08/09	金	マータラ		資料収集、整理		
13	08/10	土	マータラ		調査団内打合せ		
14	08/11	日	マータラ		休日		
15	08/12	月	マータラ		資料収集、整理		
16	08/13	火	マータラ		資料収集、整理		東京発
17	08/14	水	マータラ		資料収集、整理		コロンボ着、マータラに移動
18	08/15	木	マータラ		資料収集、整理		
19	08/16	金	マータラ		資料収集、整理		
20	08/17	土	マータラ		調査団内打合せ		
21	08/18	日	マータラ		休日		

22	08/19	月	マータラ		資料収集、整理
23	08/20	火	マータラ		資料収集、整理
24	08/21	水	マータラ		資料収集、整理
25	08/22	木	マータラ		休日
26	08/23	金	マータラ		資料収集、整理
27	08/24	土	マータラ		調査団内打合せ
28	08/25	日	マータラ		休日
29	08/26	月	マータラ		資料収集、整理
30	08/27	火	マータラ		資料収集、整理
31	08/28	水	マータラ		資料収集、整理、木口団員コロンボ発
32	08/29	木	マータラ		資料収集、整理
33	08/30	金	マータラ		資料収集、整理
34	08/31	土	コロンボ		コロンボに移動
35	09/01	日	コロンボ		休日
36	09/02	月	コロンボ		資料収集、整理
37	09/03	火	コロンボ		資料収集、整理
38	09/04	水	コロンボ		資料収集、整理
39	09/05	木	コロンボ		資料収集、整理、NWS&DBと協議
40	09/06	金	コロンボ		資料収集、整理
41	09/07	土	コロンボ		調査団内打合せ
42	09/08	日	コロンボ		休日
43	09/09	月	コロンボ		プレゼンテーション、NWS&DBと協議
44	09/10	火	機中		大使館、JICAに報告
45	09/11	水			コロンボ～東京

（2）報告書説明協議

No.	日付		宿泊地	行　動	
				佐藤	美和、澤井、渡部
1	11/04	月	コロンボ		成田発
2	11/05	火	コロンボ		コロンボ着 NWS&DBと協議
3	11/06	水	コロンボ		NWS&DBと協議
4	11/07	木	コロンボ		NWS&DBでプレゼンテーション
5	11/08	金	コロンボ		道路庁と協議、マータラ橋梁添加現地調査（澤井・渡部）
6	11/09	土	コロンボ		団内打ち合わせ
7	11/10	日	コロンボ	成田発	休日
8	11/11	月	コロンボ	コロンボ着	資料整理
				EOJ、JICA,住宅公共事業省、NWS$DBに表敬・協議	
9	11/12	火	コロンボ	NWS&DB と協議	
10	11/13	水	機中泊 / コロンボ	M/Dに署名、大使館・JICAへ報告	
11	11/14	木	機中泊	コロンボ～成田	道路庁と協議
12	11/15	金			コロンボ～成田

3. 関係者（面会者）リスト

(スリ・ランカ側)

政策開発省外資局

Mrs. Sujatha Cooray	Director General
表　新次郎	JICA Expert

住宅公共事業省

Mr. W. D. Ailapperuma	Secretary
Mr. M. L. Adulf Latiff	D. D. (Water Supply)

全国上下水道公社 (NWS&DB)

Mr. W. M. R. Wijesundara	Chairman
Mr. S. Weeraratna	General Manager
Mr. M. Wickramage	Addl. G. M.
Mr. K. M. N. S. Fernando	Addl. G. M. (P&M)
Ms. T. P. Lamabadusooriya	D. G. M. (P&D)
Mr. K. R. Dewasurendra	A. G. M. (P&D)
Mr. U. C. Pathiranage	C.E. (P&D)
Mr. D. N. J. Ferdinando	A. G. M. (Japanese Projects Unit)
池田　章	JICA Expert (Water Supply)

Mr. G. A. Kumararathne	D. G. M. (S/U)
Mr. W. A. N. Wickramatunga	A. G. M. (S)
Mr. M. Wijesinghe	C.E. (P&D)-RSC
Mr. J. V. Wijerathna	C.E. (P&C)/C-RSC
Mr. J. P. G. Jayarathna	E. (O&M)/RM-Office

(日本側)

日本国大使館

大塚　大使
遠藤　一等書記官

JICA スリ・ランカ事務所

杉原　所長
荒津　次長
石黒　所員

4．当該国の社会経済状況（国別基本情報抜粋）

スリ・ランカの主要指標

年　　度	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
人口（各年7/1現在、百万人）	16.5	16.8	17.0	17.3	17.5	17.7	17.9	18.3	18.5	18.7
人口伸び率		101.3	101.5	101.4	101.2	101.4	101.3	101.9	101.0	101.4
現在市場価格での工業系GDP 国家勘定（暦年、百万ルピー）										
現在価格での工業系ＧＤＰ	421,755	499,708	579,159	662,384	768,128	890,272	1,017,986	1,105,964	1,257,634	1,400,117
増加率		118.5	115.9	114.4	116.0	115.9	114.3	108.6	113.7	111.3
現在要素費用での電気・ガス･水道	7,417	10,362	13,486	14,846	9,171	11,280	13,660	14,425	13,415	16,127
増加率						123.0	121.1	105.6	93.0	120.2
1990年価格一定での1996年要素費用	347,822	371,876	392,884	414,608	768,128	817,288	855,701	892,496	946,046	932,336
増加率						106.4	104.7	104.3	106.0	(1.4)
現在市場価格での１人当りＧＤＰ	24,203	28,318	32,372	36,523	44,011	50,292	56,760	60,741	68,102	74,760
増加率		117.0	114.3	112.8	120.5	114.3	112.9	107.0	112.1	109.8
物価指数（期間平均）										
	1,260.4	1,408.4	1,527.4	1,644.6	1,906.7	2,089.1	2,284.9	2,392.1	2,539.8	2,899.4
消費者物価指数（コロンボ、1952 年=100）		111.7	108.4	107.7	115.9	109.6	109.4	104.7	106.2	114.2
政府の財政（12/31終了の会計年度、百万ルピー）										
歳入	85,770	98,267	110,038	136,162	146,245	164,769	174,969	195,896	211,244	231,420
中央政府の機能上の支出										
歳出	119,261	143,129	167,539	206,972	221,121	236,010	267,925	278,710	335,237	382,556
経済的サービス：電気、ガス、水道	5,660	4,821	6,036	5,993	6,625	7,302	9,561	11,586	13,756	15,324
歳出に対する比率（%）	4.7	3.4	3.6	2.9	3.0	3.1	3.6	4.2	4.1	4.0

出典：アジア開発銀行 ”Key Index 2002”

スリ・ランカの人口

	県　　名	人　　口		1981-2001 の 年間伸び率	人口密度（人/km²）	
		1981 年	2001 年		1981 年	2001 年
1	Colombo	1,699,241	2,234,289	1.3	2,605	3,305
2	Gampaha	1,390,862	2,066,096	1.9	994	1,541
3	Kalutara	829,704	1,060,800	1.2	516	673
4	Kandy	1,048,317	1,272,463	1.0	554	664
5	Matale	357,354	442,427	1.1	180	227
6	Nuwara Eliya	603,577	700,083	0.7	354	410
7	Gale	814,531	990,539	1.0	487	613
8	Matara	643,786	761,236	0.8	516	599
9	Hambantota	424,344	525,370	1.1	164	210
10	Jaffna	738,788	490,621	-2.0	795	528
11	Mannar	106,235	151,577	1.7	53	81
12	Vavuniya	95,428	149,835	2.2	36	81
13	Mullathivu	77,189	121,667	2.2	39	50
14	Kilinochchi	91,764	127,263	1.6	80	106
15	Batticaloa	330,333	486,447	1.9	134	186
16	Ampara	388,970	589,344	2.0	86	140
17	Tricomalee	255,948	340,158	1.4	98	135
18	Kurunegala	1,211,801	1,452,369	0.9	254	314
19	Puttalam	429,533	705,342	1.8	165	245
20	Anuradhapura	587,929	746,466	1.2	82	112
21	Polonnaruwa	261,563	359,197	1.6	77	117
22	Badulla	640,952	774,555	0.9	227	274
23	Monaragala	273,570	369,173	1.8	49	72
24	Ratnapura	797,087	1,008,164	1.2	246	312
25	Kegalle	784,944	779,774	0.6	412	463
	Sri Lanka	**14,846,750**	**18,732,255**	**1.1**	**230**	**299**

出典：「人口・住宅センサス 2001」センサス統計局

5．**討議議事録（**M／D**）**

Minutes of Discussions
on
The Basic Design Study
on
The Project for Improvement of Water Supply in Matara District
in
The Democratic Socialist Republic of Sri Lanka

In response to the request from the Government of the Democratic Socialist Republic of Sri Lanka (hereinafter referred to as 'Sri Lanka'), the Government of Japan decided to conduct a Basic Design Study on the Project for Improvement of Water Supply in Matara District (hereinafter referred to as "the Project"), and entrusted the study to Japan International Cooperation Agency (hereinafter referred to as 'JICA').

JICA sent to Sri Lanka the Basic Design Study Team (hereinafter referred to as 'the Team'), which was headed by Mr. Kazunori MIURA, Director, Project Monitoring and Coordination Division, Grant Aid Management Department, JICA, and was scheduled to stay in the country from July 30th to September 11th, 2002.

The Team held a series of discussions with the concerned officials of the Government of Sri Lanka and conducted a field survey in the study area.

In the course of discussions and field survey, both parties confirmed the main items described on the attached sheets. The Team will proceed to further work and prepare the Basic Design Study Report.

Colombo, August 6th, 2002

三浦和紀

Kazunori MIURA
Leader
Basic Design Study Team
Japan International Cooperation Agency
Japan

Asoka Fernando
Director – Japan Division
Department of External Resources
Ministry of Policy Development and Implementation
Sri Lanka

W.D.Ailapperuma
Secretary
Ministry of Housing and Plantation Infrastructure
Sri Lanka

Colonel W.M.R.Wijesundara
Chairman
National Water Supply and Drainage Board
Sri Lanka

ATTACHMENT

1. Objective of the Project

The objective of the Project is to improve the water supply services in Matara District in order to make safe and stable water supply for the residents.

2. Responsible and Implementing Organization

Responsible organization:

Ministry of Housing and Plantation Infrastructure

Implementing organization:

National Water Supply & Drainage Board

3. Site of the Project

The site of the Project is as shown in Annex-1 (page 4).

4. Items requested by the Government of Sri Lanka

After discussions with the Team, the items described in Annex-2 (Page 5) were finally requested by Sri Lanka side. JICA will assess the appropriateness of the request and will report the findings to the Government of Japan.

5. Japan's Grant Aid Programme

Sri Lanka side has understood the system and characteristics of Japan's Grant Aid Programme as described by the Team shown in Annex-3 (Page 6).

6. Necessary measures to be taken by the Sri Lanka side

Sri Lanka side will take the necessary measures, as described in Annex-4 (Page 10), for smooth implementation of the Project on condition that the Japanese Grant Aid is extended.

7. Further Schedule of the Study

a. The consultant members of the Team will proceed with further studies in Sri Lanka until September 11th, 2002.

b. JICA will prepare the Basic Design Study Report in English and dispatch a mission in order to explain its contents in (or around) November 2002.

c. In case the contents of the report is accepted in principle by the Government of Sri Lanka, JICA will complete the final report and send it to the Sri Lanka side by March 2003.

8. Other relevant issues

a. The target area for water supply shall be finalized after detailed examination of the data and justification of the appropriateness of water supply facilities.

b. Sri Lanka side shall present the possible site for water intake structure to the Team for topographic survey and soil investigation by August 15th, 2002 at the latest.

c. Sri Lanka side shall take measures to clear, level and reclaim the sites for water treatment plant, water intake structure and water reservoir prior to commencement of work on condition that Grant Aid is extended.

d. Sri Lanka side explained the salinity problem would be coped with the temporary barrier using sand bags in the short term and the permanent structure in the long term, and that the latter would be funded by ADB based on the Memorandum of understanding between the Government of Sri Lanka and ADB on June 20th, 2002.

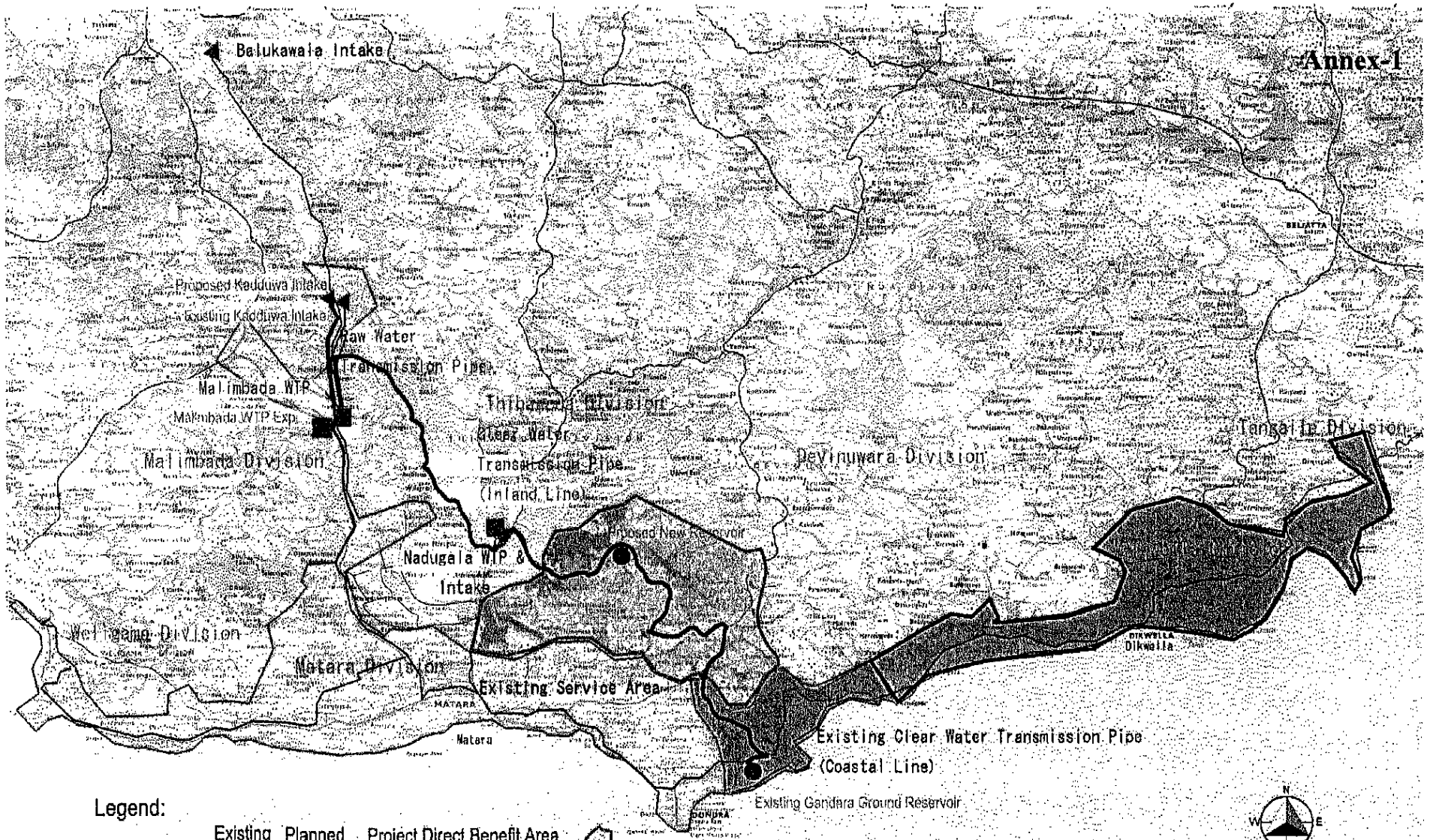
e. The taxes including customs duties and the Value Added Tax (VAT) related to the Project shall be met by implementation organization.

f. The water supply facilities requested by Sri Lanka side shall be properly operated and maintained including the collection of water rate by National Water Supply & Drainage Board.

g. If according to the local regulations environmental clearance is necessary for the Project, the Sri Lanka side should take immediate action to conduct IEE/EIA as required.

h. The Sri Lanka side described that there is no obstacle of water rights for surface water intake from Nilwala River.

Annex-1



Legend:

	Existing	Planned
Intake	▲	▲
Treatment Plant	■	■
Reservoir	●	●
Convey./Trans. Pipeline	—	—

Project Direct Benefit Area

Project Indirect Benefit Area

Existing & Proposed Matara Water Supply Schemes

Note: The design flow, service area, location and route of the water supply facilities to be newly constructed will be finally identified based on the results of the Basic Design Study.

Annex-2 List of Requested Items

1. Facility Construction

(1) Water intake structure including pumping station

(2) Raw water transmission main

(3) Water treatment plant

(4) Clear water transmission system

(5) Transmission pumping stations

(6) Storage reservoirs

(7) Distribution systems

2. Technical training as required

Annex-3 Japan's Grant Aid Programme

1. Grant Aid Procedures

a. Japan's Grant Aid Program is executed through the following procedures.

・Application	(A request made by the recipient country)
・Study	(Basic Design Study conducted by JICA)
・Appraisal &Approval	(Appraisal by the Government of Japan and Approval by the Cabinet of Japan)
・Determination of Implementation	(Exchange of Notes between the Governments of Japan and the recipient country)

b. Firstly, the application or request for a Grant Aid project submitted by a recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA (Japan International Cooperation Agency) to conduct a study on the request.

Secondly, JICA conducts the study (Basic Design Study) using (a) Japanese consulting firm(s).

Thirdly, the Government of Japan appraises the project to see whether or not it is suitable for Japan's Grant Aid Programme, based on the Basic Design Study Report prepared by JICA, and the results are then submitted to the Cabinet for an approval.

Fourthly, the project, once approved by the Cabinet, becomes official with the Exchange of Notes signed by the Governments of Japan and recipient country.

Finally, for the implementation of the project, JICA will assists the recipient country in such matters as preparing tenders, contract and so on.

2. Basic Design Study

a. Contents of the study

The aim of the Basic Design Study (hereafter referred to as "the Study") conducted by JICA on a requested project (hereafter referred to as "the Project") is to provide a basic document necessary for the appraisal of the Project by the Government of Japan. The contents of the Study are as follows:

a) Confirmation of the background, objectives, and benefits of the Project and also

institutional capacity of agencies concerned of the recipient country necessary for the Project's implementation.

b) Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, social and economic point of view.

c) Confirmation of items agreed on by both parties concerning the basic concept of the Project.

d) Preparation of a basic design of the Project.

e) Estimation of costs of the Project.

The contents of the original request are not necessarily approved in their initial form as the contents of the Grant Aid project. The Basic Design of the Project is confirmed considering the guidelines of the Japan's Grant Aid Scheme.

The Government of Japan requests the Government of the recipient country to take whatever measures are necessary to ensure its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization in the recipient country actually implementing the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country through the Minutes of Discussions.

b. Selection of Consultants

For smooth implementation of the Study, JICA uses (a) registered consultant firm(s). JICA select (a) firm(s) based on proposals submitted by interested firms. The firm(s) selected carry (ies) out a Basic Design Study and write(s) a report, based upon terms of reference set by JICA.

The consultant firm(s) used for the Study is(are) recommended by JICA to the recipient country to also work on the Project's implementation after the Exchange of Notes, in order to maintain technical consistency.

3. Japan's Grant Aid Scheme

a. Grant Aid

The Grant Aid Programme provides a recipient country with non-reimbursable funds to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for economic and social development of the country

under principles in accordance with the relevant laws and regulations of Japan. Grant Aid is not supplied through the donation of materials as such.

b. Exchange of Notes (E/N)

Japan's Grant Aid is extended in accordance with the Notes exchanged by the two Governments concerned, in which the objectives of the Project, period of execution, conditions and amount of the Grant Aid, etc., are confirmed.

c. Period

"The period of the Grant Aid" means the one fiscal year which the Cabinet approves the Project for. Within the fiscal year, all procedures such as exchanging of the Notes, concluding contracts with (a) consultant firm(s) and (a) contractor(s) and final payment to them must be completed.

However, in case of delays in delivery, installation or construction due to unforeseen factors such as weather, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two Governments.

d. Purchase of the Products and or Services

Under the Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased.

When the two Governments deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country.

However, the prime contractors, namely, consulting, constructing and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means persons of Japanese nationality or Japanese corporations controlled by persons of Japanese nationality.)

e. Necessity of "Verification"

The Government of recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. This "Verification" is deemed necessary to secure accountability to Japanese taxpayers.

f. Undertakings required of the Government of the Recipient Country

(As described in ANNEX 4)

g. Proper Use

The recipient country is required to maintain and use the facilities constructed and the equipment purchased under the Grant Aid properly and effectively and to assign staff necessary for this operation and maintenance as well as to bear all the expenses other than those covered by the Grant Aid.

h. Re-export

The products purchased under the Grant Aid should not be re-exported from the recipient country.

i. Banking Arrangements (B/A)

a) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient country in an authorized bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.

b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an authorization to pay issued by the Government of the recipient country or its designated authority.

Annex-4 Necessary Measures to be taken by the Sri Lanka side

The following necessary measures should be taken by the Sri Lanka side on condition that the Grant Aid by the Government of Japan is extended to the Project:

1. To provide data and information necessary for the Project.
2. To prepare the land for the Project and secure the authority to build facilities.
3. To secure the water rights for surface water intake development in the Project.
4. To provide proper access road to the Project area, if necessary.
5. To remove existing facilities, if necessary.
6. To bear commissions to the Japanese bank for its banking services based upon the Banking Arrangement, namely the advising commission of the "Authorization to Pay" and payment commission.
7. To ensure prompt payment of taxes, customs clearance at the port of disembarkation and facilitate prompt unloading and internal transportation therein of the materials and equipment for the Project purchased under the Grant Aid.
8. To undertake incidental outdoor works such as security of the sites, if necessary.
9. To exempt Japanese juridical and physical nationals engaged in the Project from customs duties, internal taxes and other fiscal levies which may be imposed in Sri Lanka with respect to the supply of the products and services under the verified contracts. To the extent any taxes or duties are to be paid, the implementing organization shall bear such liabilities.
10. To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contracts, such facilities as may be necessary for their entry into Sri Lanka and stay therein for the performance of their work in accordance with the relevant laws and regulations of Sri Lanka.
11. To obtain necessary permissions, licenses and other authorizations for implementing the Project, if necessary.
12. To maintain and use properly and effectively the facilities constructed and the equipment provided under the Grant Aid.
13. To bear all the expenses, other than those to be borne by the Japan's Grant Aid within the scope of the Project including provision of staff quarters for operational personnel.
14. To assign the necessary staff and secure the necessary budgetary provision for operation and maintenance of the facilities constructed and the equipment provided under the Grant Aid.

MINUTES OF DISCUSSIONS
ON
THE BASIC DESIGN STUDY
ON
THE PROJECT FOR IMPROVEMENT OF WATER SUPPLY SYSTEM IN MATARA DISTRICT
IN
THE DEMOCRATIC SOCIALIST REPABLIC OF SRI LANKA
(EXPLANATION ON DRAFT FINAL REPORT)

In November 2002, Japan International Cooperation Agency (hereinafter referred to as 'JICA') dispatched a Basic Design Study Team on the Project for Improvement of Water Supply in Matara District (hereinafter referred to as "the Project") to the Democratic Socialist Republic of Sri Lanka (hereinafter referred to as 'Sri Lanka'), and through discussion, field survey, and technical examination of the results in Japan, JICA prepared a draft final report of the study.

In order to explain and to consult with the Sri Lanka side on the contents of the draft final report, JICA sent to Sri Lanka the Draft Final Report Explanation Team (hereinafter referred to as 'the Team'), which was headed by Mr. Kohei SATO, Staff, First Project Management Division, Grant Aid Management Department, JICA, and was scheduled to stay in the country from November 11th to November 14th, 2002.

As a result of discussion, both parties confirmed the main items described on the attached sheets.

Colombo, November 14th, 2002

Kohei SATO
Leader
Basic Design Study Team
Japan International Cooperation Agency
Japan

Asoka Fernando
Director – Japan Division
Department of External Resources
Ministry of Policy Development and Implementation
Sri Lanka

W.D.Ailapperuma
Secretary
Ministry of Housing and Plantation Infrastructure
Sri Lanka

Colonel W.M.R.Wijesundara
Chairman
National Water Supply and Drainage Board
Sri Lanka

ATTACHMENT

1. Components of the Project

The Sri Lanka side agreed and accepted in principle the components of the draft final report explained by the Team. After discussions with the Team, the Sri Lanka side confirmed the components which will be constructed under the Japanese Grant Aid listed in **Annex-I**.

2. Japan's Grant Aid scheme

The Sri Lanka side understands the Japan's Grant Aid Scheme and the necessary measures to be taken by the Government of Sri Lanka as explained by the Team and described in **Annex-III** and **Annex-IV** of the Minutes of Discussions signed by both sides on August 6, 2002.

3. Schedule of the Study

JICA will complete the final report in accordance with the confirmed items and will send it to Sri Lanka by March 2003.

4. Other relevant issues

(1) Extension of the existing water supply system

Sri Lanka side confirmed to complete the following works by 2007 for proper and effective operation and maintenance of the facilities to be constructed by the Japanese Government: improvement of the existing transmission system from Dickwella reservoir to Naigala elevated tank and from Devinuwara junction to Devinuwara elevated tank; and also replacement of the existing pump in Dickwella reservoir, which are necessary.

(2) Road Reinstatement

The Sri Lanka side explained that the road reinstatement costs would be covered by the Sri Lanka side.

(3) River Crossing

The Sri Lanka side confirmed to get the permission from Road Development Authority (RDA) and Ministry of Irrigation and Water Management for attaching the transmission pipes to the existing three bridges and laying the transmission pipes in the box below the walk at the drainage pump station bridge. In case that the above mentioned will not be accepted by RDA and Ministry of Irrigation and Water Management, the Sri Lanka side will undertake the construction of independent water bridges with no additional cost to the Japanese. The pipe-laying on those bridges shall be undertaken by the Japanese side.

(4) Land Acquisition

The Sri Lanka side confirmed to secure the land for Diyagaha Ground Reservoir and lots for community based stand posts.

(5) The branches on transmission pipes

The Japanese side confirmed that the branches should be installed on transmission pipes between Diyagaha reservoir and Gandara reservoir for future extension upon the request from the Sri Lanka side.

(6) Confirmation of using the patent

Sri Lanka side shall take measures to use the British patent concerning the cloth sludge cones in Malimbada Water Treatment Plant.

(7) All the taxes

The Sri Lanka side confirmed the taxes including customs duties and the Value Added Tax (VAT) related to the Project shall be met by National Water Supply & Drainage Board.

(8) Overseas Training

The Sri Lanka side requested the execution of overseas training in Japan for the staff of National Water Supply & Drainage Board, and the Team recommended the official submission of the request concerning the training to the JICA Sri Lanka Office. The Team explained that not all requests are eligible for overseas training.

Annex- I THE PROJECT COMPONENTS

Facility Construction

1. Expansion of Kadduwa water intake structure including pumping station: capacity 15,000m3/day
2. Installation of raw water transmission main: 3km long
3. Expansion of Malinbada water treatment plant: capacity 15,000m3/day
4. Installation of clear water transmission system: 21km long
5. Construction of a new ground storage reservoir in Diyagaha: capacity 1,080m3
6. Development of distribution systems: 23km long

6．事前評価表

１．対象事業名

スリ・ランカ国マータラ上水道整備計画

２．我が国が援助することの必要性・妥当性

（１）我が国の援助対象国としての位置づけ

我が国は、スリ・ランカと伝統的友好関係にあること、1948 年の独立以来民主的選挙による政権運営を行っている民主主義国家であり、構造調整を実施し、経済改革の自助努力を行っていること、また我が国をはじめとする先進国からの経済援助がスリ・ランカの経済社会開発に不可欠であることから、経済基盤の整備・改善、鉱工業開発、農林水産業開発、保健・医療体制の改善を重要分野として援助を行っている。

（２）当該分野の援助の必要性

スリ・ランカ国政府はその貧困削減戦略(Poverty Reduction Strategy)において、「安全な水と衛生へのアクセス」を優先事項の 1 つとして捉えており、過去 15 年間本セクターの改善を持続してきた。政府の目的は 2010 年までに国民の 85%に安全な水を確保することにある。現在、安全な水は国民の 69%に行き渡っているが、農村部に限れば 57%に過ぎない。また、配水管によるサービスを受けているのは国民の 29%で、その大部分が都市部である。しかし、2010 年目標達成のための負担は政府の組織的・財務的能力を超えており、民間セクターの水道セクターへの参入が検討されている。

本プロジェクト対象地域のスリ・ランカ国南部州マータラ県の一部（4 郡：マータラ、マリンバダ、デビヌワラ、ディクウェラ）における給水率は、スリ・ランカ国中でも低く、2001 年「ス」国南部で発生した旱魃の際には、マータラ県では深刻な被害を受け、約 4 ヶ月にわたる断水状態で地域住民の基本的生活が脅かされた。さらに、同地域での人口増加による需要の増加及び高い無収水率（40%）により、給水の絶対量が不足しているので、中心部を除く殆どの地域で時間給水を余儀なくされている。また、赤痢等の水系伝染病も多発しており、マータラ地域の給水施設への早急な対策が望まれている。

３．協力対象事業の目的（プロジェクト目標）

プロジェクト対象地域に、給水施設と関連する機材を整備することにより、住民に安全で衛生的な水を安定して供給することを目的とする。

４．協力対象事業の内容

（１）対象地域

スリ・ランカ国南部マータラ県の 4 郡（マータラ、マリンバダ、デビヌワラ、ディクウェラ）

（２）アウトプット

・プロジェクト対象地域の給水施設が整備される。

（３）インプット

[日本側負担]

・カドゥワ取水場改修（15,000 m^3/日能力増強）
・カドゥワ取水場～マリンバダ浄水場間の送水管敷設
・マリンバダ浄水場改修（15,000 m^3/日能力増強）
・マリンバダ浄水場～新設ディヤガハ配水池～既設ガンダーラ配水池間の送水管敷設
・ディヤガハ配水池建設
・ディヤガハ配水区配水管網建設

[スリ・ランカ側負担]

・建設用地の確保
・送水管等の埋め戻し後の舗装復旧工事

・配水処理施設及び配水池のフェンス工事
・既存（海岸部）送水システム能力増強工事

（４）総事業費

概算事業費　　16.20 億円（日本側　14.98 億円、　スリ・ランカ側　1.22 億円）

（５）スケジュール

詳細設計期間を含め 27 ヶ月を予定。

（６）実施体制

実施機関：全国上下水道公社

５．プロジェクトの成果

（１）プロジェクトにて裨益を受ける対象の範囲及び規模

マータラ県の 4 郡（マータラ、マリンバダ、デビヌワラ、ディクウェラ）地域住民

裨益人口：199,415 人

（２）事業の目的（プロジェクトの目標）を示す指標

	現　　状		プロジェクト完了時	
	海岸部	内陸部	海岸部	内陸部
給水人口(直接裨益区域)	69,650 人	0 人	75,421 人	14,507 人
給水人口(間接裨益区域)	101,110 人		109,487 人	
給水原単位（戸別栓）	122 L 人/日		145 L 人/日	145 L 人/日
給水量(全体量)	31,800 m^3/日		46,800 m^3/日	
給水時間	12～20 時間		24 時間	

直接裨益区域：ディヤガハ配水池、ガンダーラ配水池及び以東の給水区域

間接裨益区域：ガンダーラ配水池以西の給水区域

（３）その他の成果指標

・　水因性伝染病の罹患率の改善
・　女性と子どもの水汲み労働時間の短縮

６．外部要因リスク

・　良質で安定した水源が確保される。
・　関係諸機関における専門職員が適切に配置される。
・　維持管理に必要な予算が継続して確保される。
・　大規模な天候不順や自然災害が発生しない。
・　給水量の増大に伴って能力不足を生じる既存送水施設の改善が継続してなされる。

７．今後の評価計画

（１）事後評価における成果指標

ア）給水人口　イ）給水原単位　ウ）給水量　エ）給水時間

（２）評価のタイミング

平成１７年以降に予定

7．参考資料／入手資料リスト

様式第 1 号（記第 2 関係）　　（収集／作成資料）

資 料 リ ス ト （□収集資料／□専門家作成資料）

平成 15 年 3 月 1 日作成

主管部長	文書管理課長	主管課長	情報管理課長	技術情報課長	図書館受入日

		ﾌﾟﾛｼﾞｪｸﾄ ID	－ － －	調査団番号	－ － －		
地域	南西アジア	調査団名又は専門家氏名	ｽﾘ･ﾗﾝｶ国ﾏｰﾀﾗ上水道整備事業基本設計調査	調査団の種類又は指導科目	開発調査	担当部課	無償資金協力部業務第一課
国名	ｽﾘ･ﾗﾝｶ国	配属機間名	National Water Supply and Drainage Board	現地調査期間又は派遣期間	H.14 年 7 月 29 日～H.14 年 9 月 11 日	担当氏名	佐藤　公平

番号	資料の名称	形態（図書・ﾋﾞﾃﾞｵ・地図・写真等）	資料収集	専門家作成資料	JICA 作成資料	ﾃｷｽﾄ	発行機関	取扱区分	図書館記入欄
	（方針）								
	Memorandum of Understanding for Proposed Secondary Towns and Rural Community Based Water Supply & Sanitation Project (June 2002)	報告書コピー	○				ADB and Government of Democratic Socialist Republic of Sri Lanka		
	（マータラ地区水道データ）								
	Current production & Supply in Water supply Schemes	コピー	○				NWS&DB RSC-South		
	Matara Group Distribution Pipe Line Length	コピー	○				NWS&DB RSC-South		
	Connection Details – Matara Group W.S.S. 1998-2002	コピー	○				NWS&DB RSC-South		
	Water Intake Stop at Nadugala WTP (2001)	コピー	○				NWS&DB RSC-South		
	Matara Operations and Maintenance Manual	報告書コピー	○				Sterling SPP Limited (England)		
	Matara Region General Ledger Accounting System – Income & Expenditure Statement	コピー	○				NWS&DB RSC-South		

	(Jan. – June 2002)								
	Daily Water Quality Report 2001 – Nadugala WTP	コピー	○				NWS&DB RSC-South		
	Daily Water Quality Report 2001 – Malimbada WTP	コピー	○				NWS&DB RSC-South		
	（地図、航空写真）								
	Topogaraphical Map 1:50,000 (Matara, Morawaka）	オリジナル	○				Survey Department		
	Topogaraphical Map 1:10,000	オリジナル	○				Survey Department		
	Topogaraphical Map 1:10,000 (Agricultural Base Mapping Project – Morawaka)	オリジナル	○				Survey Department		
	Aerial Photograph	Photograph	○				Survey Department		
	（人口）								
	2001 Census Population Data by GN unit	Floppy	○				Dept. of Census & Statistics		
	Population by Sex, Age, Religion, Ethnicity according to District and D.S. Division (Provisional)	報告書コピー	○				Dept. of Census & Statistics		
	Population Data for Wards and G.S. Division of Matara District (1981)	報告書抜粋 Copy	○				Dept. of Census & Statistics		
	（水道計画）								
	Matara District Water Supply Development Programme – Summary Report (Dec. 2001)	報告書コピー	○				Corporate Planning Division, NWS&DB (assisted by GTZ)		
	Matara District Water Supply Development Programme – Main Report (Dec. 2001)	報告書コピー	○				Corporate Planning Division, NWS&DB (assisted by GTZ)		
	Matara District Water Supply Development Programme – Annexes (Dec. 2001)	報告書コピー	○				Corporate Planning Division, NWS&DB (assisted by GTZ)		
	（その他）								
	RATES 2002	報告書コピー	○				Planning & Designs Division, NWS&DB		
	（設計図面）								

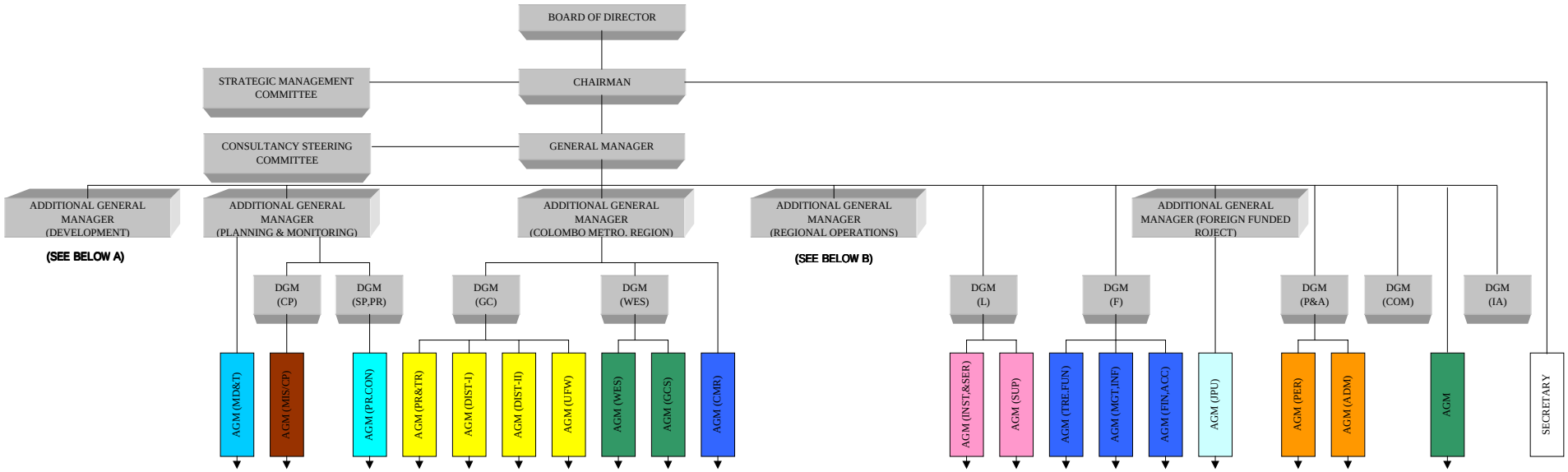
1	National Water Supply and Drainage Board Corporate Plan 1999-2000, Vol.1 Objectives	報告書コピー	○				NWSDB	JR・CR ( )・SC	
2	National Water Supply and Drainage Board Corporate Plan 1999-2000, Vol.2 Strategies	報告書コピー	○				NWSDB	JR・CR ( )・SC	
3	NWSDB Annual Report in 1999	報告書コピー	○				NWSDB	JR・CR ( )・SC	
4	NWSDB Annual Report in 1997	報告書コピー	○				NWSDB	JR・CR ( )・SC	
5	Financial Statement in '98 '99	報告書コピー	○				NWSDB	JR・CR ( )・SC	
6	Information Sheet on Completed or On-going Project	質問書回答	○				NWSDB	JR・CR ( )・SC	
11	Water Tariff – NWS&DB, May. 2002	公示コピー	○				NWS&DB	JR・CR ( )・SC	
22	Geological Map (1:20,000)	地図	○				Geological Survey and Mines Bureau	JR・CR ( )・SC	
23									
24									
25	Census of Population and Housing 2001	ペーパー	○				Department of Census and Statistics	JR・CR ( )・SC	
26	Household Income & Expenditure Survey 1995/96	ペーパー	○				Department of Census and Statistics	JR・CR ( )・SC	
27	The Gazette of the Democratic Socialist Republic of Sri Lanka No.1159/22 The National environmental Act, No.47 of 1980	ペーパー	○					JR・CR ( )・SC	
28	New Environmental Protection Licence Scheme for Industries	ペーパー	○				Centaral Environmental Authority	JR・CR ( )・SC	

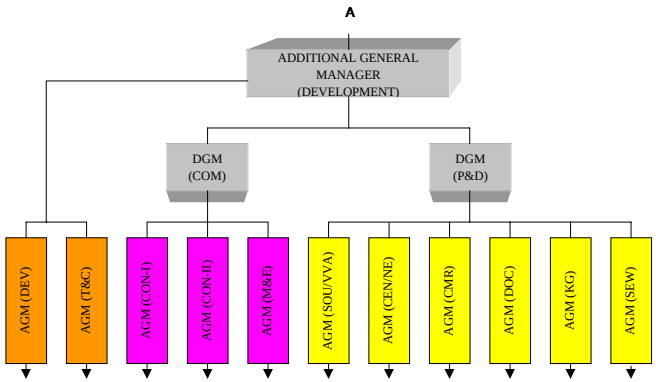
参考資料 ２

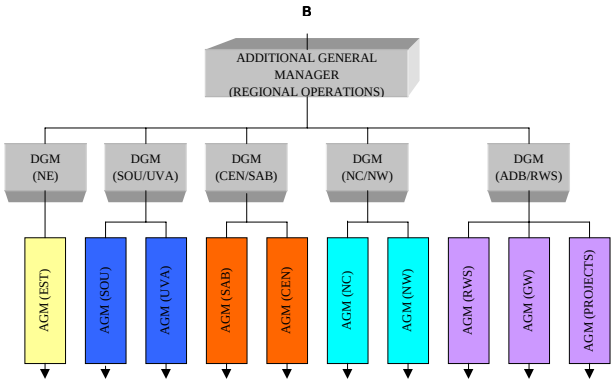
設計資料-１

付図２．１　全国上下水道公社（NWS&DB）の組織

ORGANIZATION OF NATIONAL WATER SUPPLY AND DRAINAGE BOARD





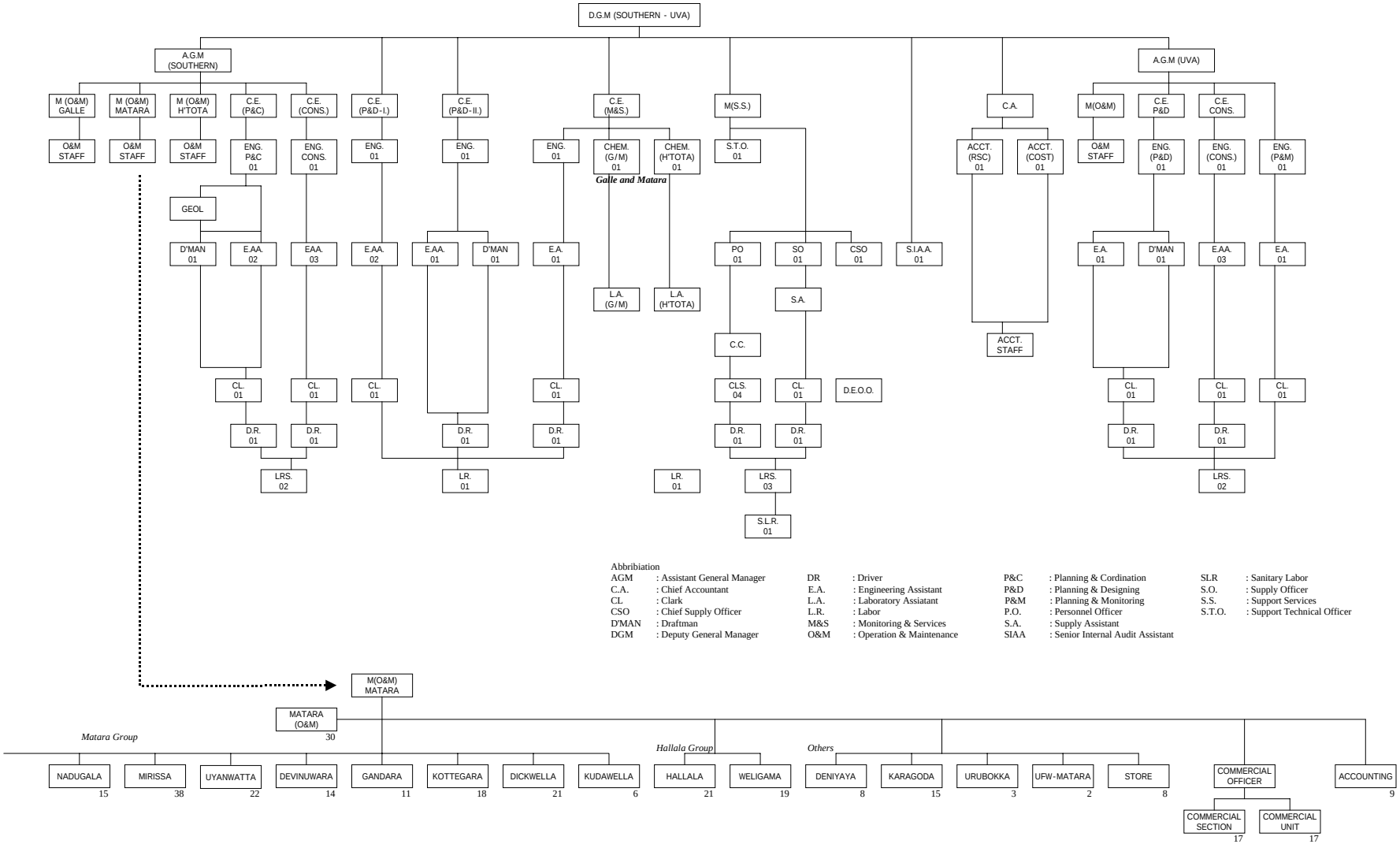


Abbreviation

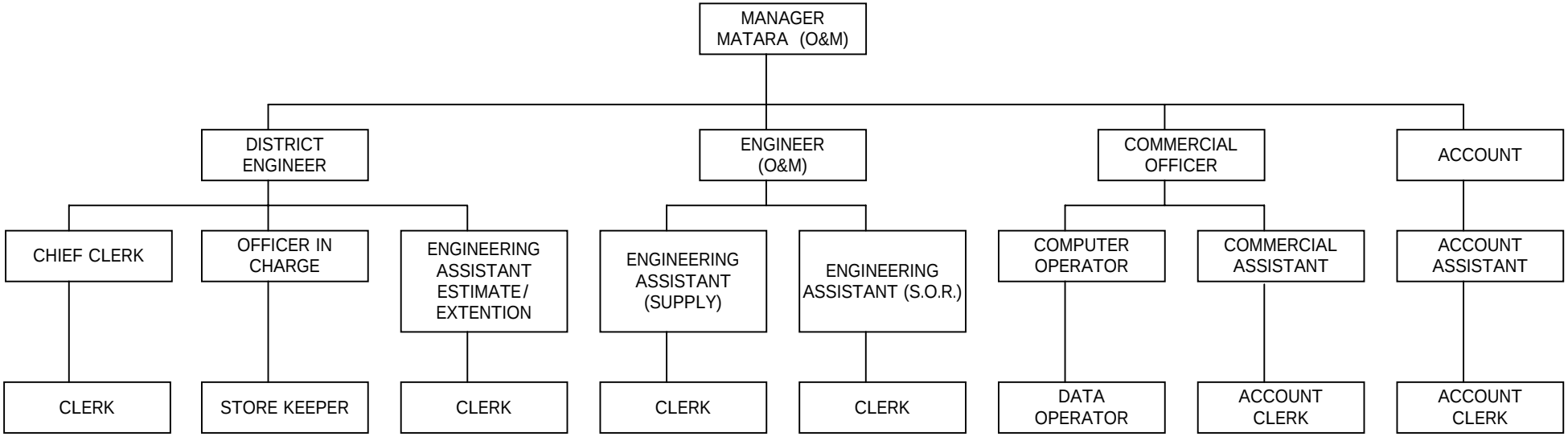
ADM:	Administration	M&E:	Mecanical & Electrical
ADB:	Asian Development Bank	MD&T:	Manpower Development & Training
AGM:	Assistant General Manager	MGT.INF:	Management Information
COM:	Commercial	MIS:	Management Information System
CON:	Construction	NC:	North Central
CP:	Corporate Planning	NE:	North Eastern
CEN:	Central	NW:	North Western
CMR:	Colombo Metropolitan Region	P&A:	Personnel & Administration
DEV:	Develoment	PR&TR:	Production & Transmission
DGM:	Deputy General Manager	P&D:	Planning & Design
DOC:	Documentation	PER:	Personnel
DIST:	Distribution	PR CON:	Project Construction
EST:	Eastern	RWS:	Rural Water Supply
F:	Finance	SAB:	Sabaragamuwa
FIN.ACC:	Financial Accounting	SEW:	Sewerage
GW:	Ground Water	SOU:	Sourthern
GC:	Greater Colombo	SP PR:	Special Projects
GCS:	Greater Colombo Sewerage	SUP:	Supplies
IA:	Internal Audit	T&C:	Tender & Contracts
INST&SER:	Instrumentation & Services	TRE.FUN.:	Treasury Function
JPU:	Japanese Project Unit	UFW:	Unaccounted For Water
KG:	Kaluganga Project	WES:	Western
LG:	Logistics		

付図２．２　全国上下水道公社南部地方局（*NWS&DB RSC-SOUTHERN/UVA*）の組織

NWS&DB RSC-SOUTHERN ORGANIZATION CHART



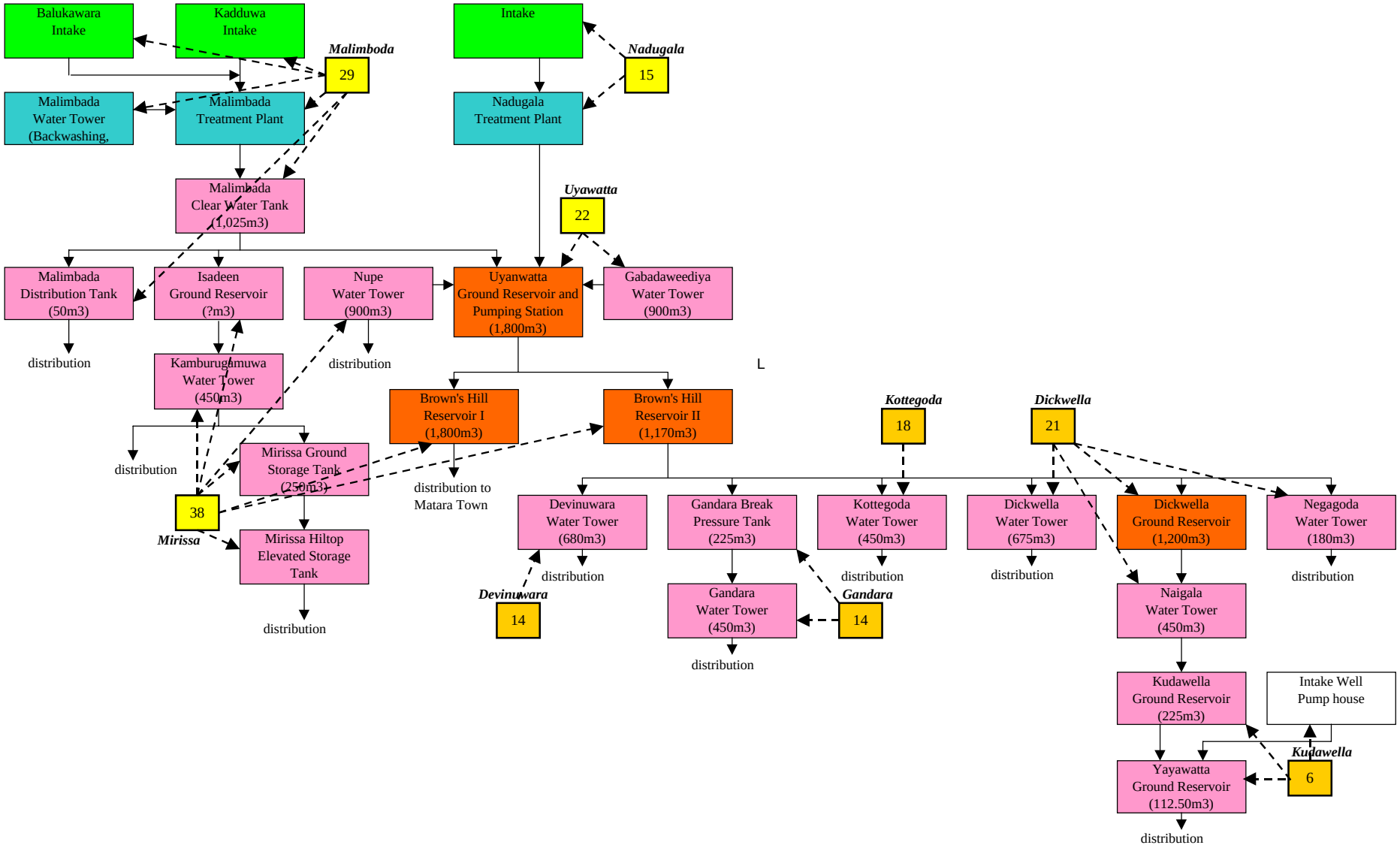
付図２．３　　全国上下水道公社マータラ地区管理事務所 （*NWS&DB MATARA (O&M)*） の組織



O&M: Operation & Maintenance
S.O.R. System Operation and Repair

付図２．４　　全国上下水道公社マータラ地区管理事務所 （NWS&DB MATARA (O&M)） の実際の職員配置

Matara Group Water Supply Scheme - Distribution and Transmission System



付表２．１　　NWS&DBキャッシュ・フロー

National Water Supply & Drainage Board

CASH FLOW STATEMENT	1996	1997	1998	1999	2000	2001
A. Net Cash Inflow Operating Activities	357,475,621	(16,162,475)	1,479,889,276	493,627,194	1,218,577,062	765,724,691
Cashiflow from Investing Activities						
Increase in Fixed Assets	(3,715,748,128)	(4,303,520,575)	(3,099,247,354)	(4,150,189,887)	(4,304,191,058)	(4,402,246,403)
New Deferred Expenditure during the year	(9,511,764)	(20,626,271)	(15,079,018)	(41,920,381)	(12,806,565)	(11,361,104)
Decrease (Increase) in Long Term Investments	709,430	(78,285,273)	(263,569,120)	(298,694,540)	(61,858,324)	(4,183,386)
(Increase)/Decrease in Short Term Investments	274,421,264	334,681,636	(330,791,688)	(64,345,238)	253,936,222	226,668,436
Capital Grants during the year	2,489,503,536	3,589,006,389	1,875,936,758	3,883,642,006	3,030,065,664	3,573,808,202
Capital Recovery Fund	0	0	117,132,457	0	0	0
Interest Income	243,972,134	148,534,969	163,184,224	219,095,723	213,243,032	250,010,199
Net Cash used in Investing Activities	(716,653,528)	(330,209,125)	(1,552,433,741)	(452,412,317)	(881,611,029)	(367,304,056)
Net Cash Inflow/((outflow) before financing	(359,177,907)	(346,371,600)	(72,544,465)	41,214,877	336,966,033	398,420,635
Cash Flow from Financing Activities						
New Loans	715,069,865	439,431,695	678,744,786	480,943,379	393,380,924	426,960,264
Loan Repayments	0	(56,399,627)	(90,032,872)	(144,305,189)	(192,604,446)	(216,082,193)
Interest Payments	(356,419,641)	(151,656,765)	(504,200,464)	(377,276,519)	(492,397,271)	(488,501,330)
Net Cash inflow from Financing Activities	358,650,224	231,375,303	84,511,450	(40,638,329)	(291,620,793)	(277,623,259)
Increase/(Decrease) in Cash ad Cash quiv.	(527,683)	(114,996,297)	11,966,985	576,548	45,345,240	120,797,376
B. Analysis of cash & cash equivalents during the year						
Balance bought forward	113,012,586	112,484,903	72,593,372	84,560,357	85,136,905	130,482,145
Increase/(Decrease) in Cash during the year	(527,683)	(114,996,297)	11,966,985	576,548	45,345,240	120,797,376
Balance carried forward	112,484,903	(2,511,394)	84,560,357	85,136,905	130,482,145	251,279,521
C. Net Cash Inflow from Operating Activities						
Operating Income after Interest	(556,034,546)	(60,895,218)	19,213,040	143,015,329	7,619,304	(91,637,177)
Depreciation	309,681,417	408,720,947	474,245,852	510,155,139	575,637,165	644,571,582
Adj. For Depreciation on Disposals	0	(13,627,907)	(10,093,759)	(7,022,214)	(440,145)	(10,617,180)
Adj. For Provision for Staff Irrecoverable Debts	0	0	0	(3,628,809)	0	0
Rechargeable Expenditure written off	389,162,414	0	0	0	0	0
Exchange Equalization Income	(14,181,685)		0	0	0	0
Deferred expenditure amortized	20,594,129	20,598,343	20,046,411	22,233,459	21,291,119	20,298,117
Pre 1995 suspense balance adjustment	118,779,271	(34,447,433)	1,312,250	(40,013,095)	(133,957,068)	59,456,527
Retiring gratuity provision	127,707,220	43,373,650	66,776,977	37,233,132	48,961,215	49,090,689
Interest	356,419,641	238,211,493	299,866,057	413,455,797	501,492,535	481,010,238
Special government levy	(40,000,000)	0	0	0	0	0
Operating inflow before working capital changes	712,127,861	601,933,875	871,366,828	1,075,428,738	1,020,604,125	1,152,172,796
Increase/Decrease in current account difference	12,859,990	1,126,881	(318,570)	1,416,496	(1,209,906)	5,615,712
Increase/Decrease in stocks	(175,968,665)	(103,230,216)	(342,449,992)	42,761,217	(111,046,736)	85,945,631
Increase/Decrease in receivables, debtors & adv.	(151,425,481)	(818,467,318)	613,482,235	(761,748,832)	227,826,764	(835,904,290)
Increase/Decrease in creditors & provisions	(40,118,084)	302,474,303	337,808,775	135,769,575	82,402,815	357,894,841
	357,475,621	(16,162,475)	1,479,889,276	493,627,194	1,218,577,062	765,724,690

付表２．２　　NWS&DB長期的損益計算書

National Water Supply & Drainage Board - Income and Expenditure trends

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Income													
Sales of Water	292.2	478.2	923.7	964.8	1,128.9	1,299.4	1,498.9	1,525.8	2,042.9	2,569.2	2,707.6	2,991.7	3,376.1
Other revenue	69.3	80.8	176.7	246.8	360.0	408.3	444.2	478.0	412.8	426.7	669.5	659.7	883.9
Total	361.5	559.0	1,100.4	1,211.6	1,488.9	1,707.7	1,943.1	2,003.8	2,455.7	2,995.9	3,377.1	3,651.4	4,260.0
Expenditure													
Direct Expenditure	374.3	424.9	574.2	671.8	814.5	1,001.5	1,175.5	1,501.2	1,648.2	1,934.1	1,950.0	2,263.9	2,863.0
Surplus (Deficit) from direct operation	(12.8)	134.1	526.2	539.8	674.4	706.2	767.6	502.6	807.5	1,061.8	1,427.1	1,387.5	1,397.0
1. Depreciation/amortization	250.9	248.2	242.1	251.3	282.9	283.7	276.7	330.1	429.3	494.3	532.4	596.9	664.9
2. Loan Interest	129.3	73.9	74.8	101.2	201.9	224.1	285.9	356.0	238.2	299.9	413.5	501.5	481.0
3. Provision of Bad Debtors	0.0	0.0	0.0	0.0	9.7	2.9	5.5	0.0	14.8	18.6	82.0	19.3	43.6
4. Retiring Gratuity	0.0	0.0	0.0	0.0	0.0	13.2	12.9	127.7	43.4	66.8	37.2	49.0	49.1
Total of 1 to 4	380.2	322.1	316.9	352.5	494.5	523.9	581.0	813.8	725.7	879.6	1,065.1	1,166.7	1,238.6
Special Government Levy and trs. To Cap.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	40.0	0.0	0.0	121.1	119.3	136.5
Income (Loss)	(393.0)	(188.0)	209.3	187.3	179.9	182.3	186.6	(351.2)	81.8	182.2	240.9	101.5	21.9

(Unit: Million Rupee)

付表２．３　ナドゥガラおよびマリンバダ浄水場原水および処理水水質

Raw and Treated Water quality at Nadugala and Malimbada Water Treatment Plants (2001)

Date	Tutbidity						pH						RCL		
	Raw Water			Treated Water			Raw Water			Treated Water			Raw Water		
	AVG (NTU)	MAX (NTU)	MIN (NTU)	AVG (NTU)	MAX (NTU)	MIN (NTU)	AVG	MAX	MIN	AVG	MAX	MIN	AVG (mg/L)	MAX (mg/L)	MIN (mg/L)
Nadugala WTP															
Jan	42.39	118.40	14.00	0.80	1.52	0.45	6.64	6.90	6.36	7.28	7.60	7.12	1.50	1.50	1.50
Feb	34.98	99.00	15.00	1.12	1.96	0.84	6.71	6.90	6.45	7.27	7.60	7.12	1.50	1.52	1.50
Mar	17.70	30.60	13.00	1.24	1.91	0.93	6.84	6.90	6.60	7.27	7.44	7.16	1.50	1.52	1.47
Apr	33.97	81.40	14.60	1.48	2.34	1.00	6.78	7.00	6.54	7.27	7.40	7.16	1.50	1.60	1.50
May	20.31	39.60	15.50	1.70	2.47	1.00	6.84	7.00	6.71	7.24	7.40	7.13	1.52	2.06	1.50
Jun	15.52	19.00	13.57	1.82	2.20	1.52	6.96	7.00	6.80	7.25	7.40	7.15	1.50	1.58	1.42
Jul	17.25	17.50	17.00	1.87	1.93	1.81	7.02	7.10	6.93	7.20	7.24	7.13	1.48	1.50	1.30
Aug							7.19	7.30	7.10	7.22	7.35	7.14	1.50	1.62	1.42
Sep	26.15	31.40	20.66	1.75	3.78	0.85	7.00	7.20	6.68	7.21	7.26	7.20	1.39	1.50	1.08
Oct	27.59	77.00	18.00	1.16	3.03	0.50	6.87	7.00	6.80	7.25	7.40	7.10	1.47	1.75	1.00
Nov	41.86	101.20	22.00	1.21	2.24	0.68	6.81	6.90	6.72	7.26	7.52	7.12	1.47	1.52	1.00
Dec	40.49	102.60	24.00	1.20	2.28	0.13	6.80	6.80	6.68	7.25	7.45	7.00	1.51	1.87	1.33
Average	26.13			1.10			6.76			7.16			1.47		
Malimbada WTP															
Jan	35.92	147.83	8.91	2.09	2.88	1.67	6.52	6.90	6.05	7.21	7.32	6.97	0.99	1.00	0.86
Feb	26.06	72.83	7.17	1.66	2.35	0.67	6.66	6.98	6.37	7.23	7.36	7.13	0.96	1.00	0.85
Mar	13.91	43.37	6.03	0.95	1.69	0.20	6.82	7.00	6.54	7.25	7.32	7.17	0.94	1.03	0.81
Apr	29.57	104.08	6.29	1.43	1.92	0.75	6.71	7.00	6.37	7.24	7.35	7.05	0.83	0.94	0.70
May	12.60	39.50	7.04	1.82	2.30	1.07	6.80	7.00	6.49	7.24	7.40	6.97	0.82	0.89	0.75
Jun	1.38	9.20	0.00	0.34	2.13	0.00	7.01	7.30	6.80	7.20	7.36	7.06	0.81	0.88	0.76
Jul	7.01	20.69	4.57	0.77	1.02	0.53	7.07	7.82	6.00	7.19	7.30	7.04	0.80	0.83	0.78
Aug	5.37	6.10	4.96	0.84	1.03	0.61	7.11	7.18	7.10	7.20	7.34	7.10	0.80	0.90	0.77
Sep	8.49	29.50	4.73	0.98	1.76	0.67	7.06	7.18	6.85	7.18	7.26	7.07	0.81	0.89	0.75
Oct	13.75	56.25	6.59	1.77	3.48	1.38	6.93	7.87	6.52	7.09	7.30	6.92	0.80	0.89	0.75
Nov	23.14	52.50	7.95	1.82	2.35	1.54	6.69	7.00	6.30	7.09	7.20	6.99	0.82	0.87	0.73
Dec	23.37	79.00	9.50	1.37	2.14	0.58	6.59	6.80	6.28	7.11	7.27	7.00	0.81	0.86	0.77
Average	16.65			1.32			6.83			7.18					

付表２．４　マータラ地区ポンプ場一覧表

EXISTING PUMP STATION

No	Pump Station	Pump to	Type	Unit		Capacity		Head m	KW	Speed (rpm)	Operation Time（Hr.）	Year Installed
				Duty	Stand	M^3/Hr	L/S					
	Nadugala W.T.P.											
1	Intake Low Level	Nadugala W.T.P.	Vertical Turbine Pump	1	1	400	112	15	45	1470	24	1994
2	Treatment Plant High Level	Uyanwatta G.R.	Centrifugal Split Casing	1	1	375	104	25	37	1470	24	1985
	Malimbada W.T.P.											
3	Balakawala Intake	Malimbada W.T.P.	Vertical Turbine Pump	2	1	335	93	96	132	1450	24	1997
4	Kadduwa Intake	Malimbada W.T.P.	Vertical Turbine Pump	2	2	335	93	55	75	1470	24	1985,1995 1997
	Matara Group W.S.S.											
5	Uyanwatta Pumping Station	Nupe Elevated Tank	Centrifugal Split Casing	1	0	250	70	33	30	1475	20	1985
		Gabadaweediya Elevated Tank	Centrifugal Split Casing	1	0	250	70	33	30	1475	20	1985
		Brownshill G.R. 1 & 2	Centrifugal Split Casing	2	1	525	146	60	125	1485	24	2002
6	Isadeen Pumping Station	Nupe Elevated Tank	Centrifugal Split Casing	1	1	135	37.5	60	37	1472	20	1995
		Kaburugamuwa E.T.	Centrifugal Split Casing	1	1	135	37.5	41	22	1472	20	1995
7	Kaburugamuwa Pumping Station	Mirissa Hill Top Ground Storage Tank	Centrifugal Split Casing	1	1	20	5.6	45	11	2900	16	1995
8	Gandara Pumping Station	Gandara Elevated Tank	Centrifugal Split Casing	1	1	126	35	31	18.5	1460	12	1985
9	Kottegoda Pumping Station	Kottegoda Elevated Tank	Centrifugal Split Casing	1	1				15	2910		2001
10	Dickwella Pumping Station	Dickwella Elevated Tank	Centrifugal Split Casing	1	1	135	37.5	36.1	22	1470	12	1985
		Naigala Elevated Tank	Centrifugal Split Casing	1	1	83	23	70.2	30	1450	12	1985
		Medagoda Elevated Tank	Centrifugal Split Casing	1	1	68.4	19	61	18.5	1450	12	1995
11	Kudawella Ground Reservior	Yayawawtta Ground reservior	Centrifugal Split Casing	1	1	36.4	10.1	80	11	2900	6	

付表２．５　マータラ地区主要送水管一覧表

EXISTING TRANSMISSION PIPE SYSTEM - MATARA GROUP W.S.S.

No	Pipe Line	From	To	Diameter mm	Length M	Material	Constructed Year	Remarkes
	Nadugala W.T.P.							
1	Raw water pumping transmission	Intake	W.T.P.	350	130	C.I.P.	1963	
2	Treated water pumping transmission	Nadugala G.R.	Uyanwatte G.R.	350	5000	C.I.P.	1963	
	Maimbada W.T.P.							
3	Raw water pumping transmission	Balakawala Intake	Kadduwa Junction	400	6,630	D.I.P.	1997	
4	Raw water pumping transmission	Kadduwa Intake	Kadduwa Junction	400	20	D.I.P.	1985	
5	Raw water pumping transmission	Kadduwa Junction	Malimbada W.T.P.	600	2,960	D.I.P.	1985	
6	Treated water Gravity transmission	Malimbada Clear Water Tank	Uyanwatte G.R.	500	10,040	D.I.P.	1985	
7	Treated water Gravity transmission	Malimbada Clear Water Tank	Isadeen G.R.	350	8,800	D.I.P.	1997	
	Uyanwatte W.S.S.							
8	Treated water pumping transmission	Uyanwatte G.R.	Nupe E.T.	300	2,000	D.I.P.	1985	
9	Treated water pumping transmission	Uyanwatte G.R.	Gabadaweediya E.T.	300	500	D.I.P.	1985	
10	Treated water pumping transmission	Uyanwatte G.R.	Brownsill G.R. 1 & 2	500	2,000	D.I.P.	1985	
11	Treated water pumping transmission	Isadeen G.R.	Nupe E.T.	200	2,820	D.I.P.	1997	
12	Treated water pumping transmission	Isadeen G.R.	Kaburugamuwa G.R.	200	4,270	D.I.P.	1997	
13	Treated water Gravity Transmission	Brownsill G.R. 2	Devinuwara Bulk Meter	500	3,320	D.I.P.	1985	
	Devinuwara & Gandara W.S.S.						1985	
14	Treated water Gravity Transmission	Devinuwara Bulk Meter	Devinuwara Junction	450	900	C.I.P.	1985	
15	Treated water Gravity Transmission	Devinuwara Junction	Devinuwara E.T.	150	400	C.I.P.	1985	
16	Treated water Gravity Transmission	Devinuwara Junction	Gandara Junction	450	4,090	A.C.P.	1985	
17	Treated water Gravity Transmission	Gandara Junction	Gandara B.P.T.(g.r.)	225	400	A.C.P.	1985	
18	Treated water pumping transmission	Gandara B.P.T.	Gandara E.T.	150	80	C.I.P.	1985	
	Kottegoda W.S.S.							
19	Treated water Gravity Transmission	Gandara Junction	Kottegoda G.R. Tee	400	4,960	A.C.P.	1985	
20	Treated water Gravity Transmission	Kottegoda G.R. Tee	Kottegoda G.R.	400	80	D.I.P.	2002	
21	Treated water pumping transmission	Kottegoda G.R.	Kottegoda E.T.	300	29	D.I.P.	2002	
	Dicwella W.S.S.							
22	Treated water Gravity Transmission	Kottegoda E.T.	Kottegoda Junction	300	121	A.C.P.	1985	
23	Treated water Gravity Transmission	Kottegoda Junction	Dickwella Junction	300	5,070	A.C.P.	1985	
24	Treated water Gravity Transmission	Dickwella Junction	Dickwella G.R.	300	120	A.C.P.		
25	Treated water pumping transmission	Dickwella G.R.	Batheegama E.T.	200	80	A.C.P.	1985	
26	Treated water pumping transmission	Dickwella G.R.	Naigala E.T.	200	2,256	A.C.P.	1985	
27	Treated water pumping transmission	Dickwella G.R.	Medagoda E.T.	200	4,000	UPVC	1994	
	Kudawella W.S.S.							
28	Treated water Gravity Transmission	Naigala E.T.	Kudawella G.R.	160	6,000	UPVC		
29	Treated water pumping transmission	Kudawella G.R.	Yayawatta G.R.	160	4,400	UPVC		

付表２．６　マータラ地区配水池一覧表

EXISTING SERVICE RESERVIOR AND ELEVATED TANK

No	Reservior/Tank	Abstract from	Feed to	Volume M^3	T.W.L. M MSL	B.W.L. M MSL	Type
1	Nadugala Ground Sump	Nadugala W.T.P.	Uyanwatta G.R.	225	15.0	12.0	Rectangular G.R.
2	Malimbada Clear Water Tank	Malimbada W.T.P	Isadeen G.R. & Isadeen G.R	1025	40.0	36.4	Circular G.R.
3	Uyanwatta Ground Reservior	Malimbada & Nadugala W.T.P.	Nupe,Gabadaweediya E.T. Brownsill G.R.- R1 & R2	1850	2.9	-0.1	Rectangular G.R.
4	Nupe Elevated Tank	Uyanwatta G.R. & Isadeen G.R.	Matara Town	900	27.29	24.29	Circular E.T.
5	Gabadaweediya Elevated Tank	Uyanwatta G.R.	Matara Town	900	27.65	24.65	Circular E.T.
6	Brownsill Ground Rservior 1	Uyanwatta G.R.	Matara Town	1800	47.3	43.9	Circular G.R.
7	Brownsill Ground Rservior 2	Uyanwatta G.R.	Devinuwara to Kudawella reserviors	1170	47.3	43.9	Rectangular G.R.
8	Devinuwara Elevated Tank	Brownsill Ground Rservior 2	Devinuwara Distribution	682	31.95	26.68	Circular E.T.
9	Gandara Break Pressure Tank	Brownsill Ground Rservior 2	Gandar Elevated Tank & Gandara Distribution	318	30.53	26.31	Circular G.R.
10	Gandara Elevated Tank	Gandara Break Pressure Tank	Gandara Distribution	455	54.00	50.5	Circular E.T.
11	Kottegoda Ground Sump	Brownsill Ground Rservior 2	Kottegoda Elevated Tank	225	14.20	11.20	Rectangular G.R.
12	Kottegoda Elevated Tank	Kottegoda Ground Sump	Kottegoda Distribution	450	35.50	32.00	Circular E.T.
13	Dickwella Ground Reservior	Brownsill Ground Rservior 2	Batheegama, Naigala, Medagoda Reserviors	1200	5.05	1.25	Circular G.R.
14	Dickwella Elevated Tank	Dickwella Ground Reservior	Dickwella Distribution	675	32.00	28.5	Circular E.T.
15	Naigala Elevated Tank	Dickwella Ground Reservior	Dickwella Distribution	450	60	54.5	Circular E.T.
16	Medagoda Elevated Tank	Dickwella Ground Reservior	Dickwella Distribution	180	52.75	34.95	Circular E.T.
17	Kudawella Ground Reservior	Naigala Elevated Tank	Kudawella Distribution	225			Rectangular G.R.
18	Yayawatta Ground Reservior	Kudawella Ground Reservior	Kudawella Distribution	112.5			Rectangular G.R.
19	Malimbada Distribution contact Tank	Malimbada Clear Water Tank	Malimbada Distribution	50	32.4	32.2	Square G.R.
20	Isadeen Ground Reservior	Malimbada Clear Water Tank	Kaburugamuwa Elevated Tank & Nupe Tank	1250	5.8	2.1	Rectangular G.R.
21	Kaburugamuwa Elevated Tank	Isadeen Ground Reservior	Kaburugamuwa Distribution & Mirissa Ground Reservior	450	-	-	Circular E.T.
22	Mirissa Ground Storage Tank	Kaburugamuwa Elevated Tank	Mirissa Hill Top Ground Reservior	125	4.15	2	Rectangular G.R.
23	Mirissa Hill top Reservior	Mirissa Hill Top Ground Storage Tank	Mirissa Distribution & Weligama Polwatta area	250	29.4	27.2	Rectangular G.R.