CHITTAGONG WATER SUPPLY AND SEWERAGE AUTHORITY (CWASA)

CWASA Rolling Five Year Business Plan 2011/12 – 2015/16

June 2012

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1 INTRODUCTION

This Five Year Business Plan outlines how CWASA advances towards the goals established for a five year period of FY 2012 to FY 2016.

Within CWASA the plan is used as a strategic tool to help drive the business. For external stakeholders, it forms a part of the performance agreement between CWASA and GOB. The plan also serves as an evidence of CWASA' managerial capability when CWASA needs to secure external financing. As a rolling plan, the plan will be reviewed and updated annually.

2 MANDATE, VISION, MISSION AND GOALS

2.1 Mandate

The WASA Act 1996 was made effective on CWASA from May 2008. This act states that the statutory responsibilities of CWASA are:

- Construction, improvement, expansion, operation and maintenance of necessary infrastructure for water supply for domestic, industrial and commercial purpose.
- Construction, operation and maintenance of sewerage system
- Construction, operation and maintenance of drainage facilities

Thus CWASA is mandated to perform the above activities.

2.2 Vision

Although CWASA has been given such a wide range of mandates, its current activities are limited only to the domain of water supply. The sewerage system in Chittagong is nonexistent. The drainage systems is planned and constructed by the Chittagong Development Authority (CDA). The operation and maintenance is charged to the Chittagong City Corporation (CCC).

Under the current circumstances, CWASA is doing day-to-day operations, confining its activities only to the water supply. But under the WASA Act 1996, CWASA should become an all-around operator of water supply, sewerage and drainage. This is still a far reaching dream, but it is essential for CWASA to break out of simple water supply operator and expand its operations to other lines of business. This is not only because CWASA must fulfil the mandates but also because the new business lines are considered as opportunities for growth.

The vision below stated provides a broad direction of where CWASA would like to go. This vision is also a driving force in providing direction to stakeholders, management and employees of CWASA.

"To be an organization that is the most efficient Water & Sewerage Authority in Bangladesh".

2.3 Mission Statement

A mission statement is usually created when an organization creates its initial business plan. Every time the organization embarks on its strategic planning process, it should also take the time to review its mission statement. A mission statement can work as an effective tool not only to improve the profitability but also to inspire and influence employees by generating passion and commitment within the organization. A powerful mission statement becomes integrated into the organizational culture and that also becomes a force in terms of decision making and direction.

According to the Citizen Charter, CWASA's aims in water supply are "to develop infrastructure, administration and reservation for distributing purifying water to residential, social, official, industrial and business institution in Chittagong". As to sewerage, CWASA's "routine work" is to "develop sewerage structure and storm water drainage system". The charter states as "commitment of CWASA", (i) infrastructure development is necessary to fulfil demand of safe and potable water, (ii) to increase revenue income by reducing system loss, (ii) to assure quality service by increasing institutional efficiency, (iii) accurate and practical planning will be necessary for development of long term water supply, sewerage and discharge of rain water, and (iv) to ensure sewerage facility, infrastructure of sewerage system should develop as soon as possible.

Having interpreted and summarized the above aims, the mission statement of CWASA is decided below, which is considered to be inspirational and simple to remember.

"To provide quality water supply, sewerage and drainage services in the most cost effective manner; while applying appropriate technologies that are environmentally friendly."

The core values are principles that guide CWASA's internal conduct as well as its relationship with external stakeholders such as customers, suppliers and the government. The core values are also the basic elements underlying CWASA's strategies to fulfil the mission. The following core values are identified.

- Professionalism
- Customer focus
- Team work spirit
- Value for money
- Environmental Consciousness
- Quality
- Innovativeness
- Accountability

Motto:
Effective and dynamic organizations provide constant reminders to all key players of its priorities and major aspirations. The reminder is effectively realized through slogans and mottos. The motto for CWASA is:
" Sustha Jiboner Janna Pani" : Water for Safe Living.

2.4 Goals for The Next Five Years

Goals for the next five years are identified through the process of capital project planning, expenditure and revenue planning, and loan repayment scheduling. Accomplishment of targets for selected key performance indicators (KPIs) is also included in the goals. Consequently the following goals are set.

No.	Indicator	FY2011 performance	Goal
1	Water supply coverage	42%	70% in FY2016
2	Average water tariff	Tk 8.24/m^3	Tk 10.52/m^3 in FY2016
3	Unit production cost	Tk 6.71/m^3	Tk 21.52/m^3 in FY2016
4	Operating ratio	0.77	2.27 in FY2016
5	Non Revenue Water	28%	26% in FY2016
6	Revenue collection efficiency	99%	95% in FY2016
7	Collection period	200 days	120 days in FY2016
8	No. of employee per 1000 connections	11.4	10.0 in FY2016
9	Water supply from Karnaphuli WTP	-	Start in FY2014
10	Water supply from Modunagaht WTP	-	Start in FY2016
11	Pipe rehabilitation project	-	Implement in FY2016
12	Sewerage project	-	Implement in FY2016 Commission in FY2021
13	Drainage project	-	Implement in FY2016 Commission in FY2020
14	Computerized accounting system	-	Implement in FY2013
15	Customer-friendly revenue collection options	-	Establish in FY2013
16	Functioning meter ratio	77%	100% in FY2016

3 BASE SCENARIO

In setting a base case scenario, various parameters and indicators in the five years were considered. Those indicators are divided into two types, "financial" indicators and "non-financial" indicators. The "financial" indicators are computed on the CWASA financial model program. They are main indicators related to the financial performance therefore labelled "key performance indicators" (KPIs). The "non-financial" indicators do not directly affect the financial performance. They are more related to technical side of the CWASA operation. The base case scenario in business plan was established as a result of reconciliation of assumptions and targets that often conflict with each other.

3.1 Performance Forecast (Key Performance Indicators)

Forecast of KPIs under the base case scenario are shown in the table below.

No.	Indicator	Unit	2010/11 (Past year)	2011/12 (1st year)	2012/13 (2nd year)	2013/14 (3rd year)	2014/15 (4th year)	2015/16 (5th year)
C99	Water production	MLD	187	207	207	207	343	433
H8	Water supply coverage	%	42	46	51	56	63	70
E2	Non Revenue Water	%	28	28	27	27	26	26
A1	Operating ratio	Ratio	0.77	1.00	1.19	1.70	2.03	2.27
A2	Number of employees per 1000 connections	Nos	11.4	12.4	13.2	12.1	10.9	10.0
A3	Number of permanent employees *1	Nos.	519	620	740	750	750	760
A4	Permanent staff ratio	%	72	72	72	72	72	72
A5	Avrage effective tariff *2	Tk/m3	8.24	8.65	9.09	9.54	10.02	10.52
A6	Unit production cost	Tk/m3	6.71	8.75	10.96	16.27	18.80	21.52
A7	Revenue collection efficiency *3	%	99	95	95	95	95	95
G4	Collection period	Days	200	190	197	206	135	120
B11	Gross profit	Tk million	140	0	-133	-507	-1,194	-1,903
B13	Cash flow	Tk million	128	113	86	51	155	164
	*1: Number of actual on-roll employees out of sanctioned 826 posts.							
	*2: Tariff increase is assumed to be limited only to 5% a year, which is a major cause of projected losses.							
	To avoid such losses, the water tariff should be increased according to increase of electricity, financial and other costs.							
	*3: The existing billing system cannot classify accounts receivable by age.							
	After completing new billing system, actual collection efficiency can be obtained.							

The gross profit directly indicates if the operation is financially sound. In the schedule above there will be years with a gross loss and as a result the total gross profit throughout the five year period will be negative. The revenues are not sufficient to cover the cost increase.

Thus a tariff increase is considered inevitable to reduce the gross loss. Assuming the tariff can be increased by 5% in the 1st year, 15% in each of the 2nd to the 5th years, the performance of affected indicators will change as follows. It is noted that even this level of tariff increase cannot entirely offset the gross loss.

No.	Indicator	Unit	2010/11 (Past year)	2011/12 (1st year)	2012/13 (2nd year)	2013/14 (3rd year)	2014/15 (4th year)	2015/16 (5th year)
A1	Operating ratio	Ratio	0.77	1.00	1.11	1.46	1.58	1.62
A5	Avrage effective tariff	Tk/m3	8.24	8.65	9.95	11.45	13.16	15.14
G4	Collection period	Days	200	190	181	176	109	94
B11	Gross profit	Tk million	140	0	-79	-389	-867	-1,298
B13	Cash flow	Tk million	128	113	138	163	467	743

3.2 Performance Forecast (Non-financial Indicators)

The non-financial indicators are forecasted in the table below.

No.	Indicator	Unit	2010/11 (Past year)	2011/12 (1st year)	2012/13 (2nd year)	2013/14 (3rd year)	2014/15 (4th year)	2015/16 (5th year)
H1	Bill sent-out ratio	%	95.0	95.5	96.0	96.5	97.0	98.0
H2	Meter installation ratio	%	95	95	95	95	95	100
H3	Metered volume to billed volume ratio	Ratio	0.710	0.748	0.786	0.824	0.862	0.900
H4	Water quality sample	Nos/mth	N/A	50	60	70	80	90
H5	Satisfactory sample in chlorine level	%	N/A	95.0	95.0	95.0	95.0	95.0
H6	Satisfactory sample in microbiological level	%	N/A	99.5	99.5	99.5	99.5	99.5
H7	Leakage occurrence	No./km/mth	0.410	0.380	0.380	0.380	0.380	0.380
H8	Water supply coverage	%	42	46	51	56	63	70
H9	Population of Chittagong	million	3.975	4.050	4.125	4.200	4.275	4.350
H10	Population in CWASA service area	million	2.980	3.000	3.100	3.200	3.400	3.600
H11	Population served with piped water	million	1.192	1.300	1.512	1.736	2.070	2.432
H12	Population served with stand pipes or slum water points	million	0.070	0.070	0.070	0.070	0.070	0.070
H13	Number of stand pipes (street hydrant)	Nos.	689	689	689	689	689	689
H14	Population per connection	Nos.	26	26	27	28	30	32
H15	Population per stand pipe	Nos.	102	102	102	102	102	102
H16	Water use per street hydrants	lpd	50	55	55	55	70	100
H17	Water use per capita of street hydrant users	lpcd	0.5	0.5	0.5	0.5	0.7	1.0
H18	Total water consumption by street hydrants	MLD	34	38	38	38	48	69
H19	Total water consumption by piped water system	MLD	101	111	114	114	206	252
H20	Water use per capita of piped water users	lpcd	84	86	75	65	99	104

4 REVENUE AND EXPENDITURE PLAN

The revenue and expenditure plan is a straightforward tool to see the profitability of operation. The gross profit or loss directly indicates if the operation is financially sound. It should be noted that the profit does not mean positive cash flow. As the gross profit is nominal indicator, even if it becomes negative, the cash flow can be positive. The positive cash flow means that the operation is sustainable for the meantime.

4.1 Revenue and Expenditure Schedule

Revenue and expenditure items can be minutely classified. However, to analyze revenue and expenditure behaviours in reasonable detail, the number of items should be limited. For the form of CWASA's revenue and expenditure plan, the revenue items are divided into four types, (i) water revenue, (ii) tube well license fee, (iii) interest revenue and (iv) other revenue. The expenditure items are divided into six, (i) personnel cost, (ii) electricity cost, (iii) chemicals, (iv) depreciation, (v) other O&M cost and (vi) financial expense. As a result, the revenue and expenditure plan of coming five years are set as shown in the table below.

No.	Indicator	Unit	2010/11 (Past year)	2011/12 (1st year)	2012/13 (2nd year)	2013/14 (3rd year)	2014/15 (4th year)	2015/16 (5th year)
B1	Water revenue	Tk	406,098,611	471,890,906	502,367,194	527,485,554	929,463,045	1,231,653,262
B2	Tubewell license	Tk	41,037,301	43,624,800	43,624,800	43,624,800	32,718,600	32,718,600
B3	Interest revenue	Tk	77,400,000	85,500,000	85,500,000	85,500,000	85,500,000	85,500,000
B4	Other revenue	Tk	74,747,576	61,861,885	65,519,039	68,533,242	115,461,797	151,724,623
B5	Total revenue	Tk	599,283,488	662,877,591	697,011,033	725,143,596	1,163,143,442	1,501,596,485
B6	Personnel Cost	Tk	179,914,000	227,195,868	284,727,725	303,004,167	318,154,375	338,516,255
B7	Electricity Cost *	Tk	140,000,000	170,000,000	204,000,000	244,800,000	486,313,200	736,485,734
B8	Chemeicals	Tk	18,660,000	21,683,119	22,767,274	23,905,638	41,554,019	55,064,205
F2	Depreciation	Tk	55,404,000	50,351,827	50,351,827	239,101,827	562,659,597	762,217,367
B9	Other operating cost	Tk	41,414,603	48,124,209	50,530,420	53,056,941	92,226,325	122,211,264
D201	Financial Expense	Tk	23,961,351	145,285,164	217,664,164	368,255,315	855,851,724	1,390,118,857
B10	Total expenditure	Tk	459,353,954	662,640,187	830,041,410	1,232,123,888	2,356,759,240	3,404,613,682
B11	Gross profit	Tk	139,929,534	237,404	-133,030,376	-506,980,292	-1,193,615,798	-1,903,017,197
B12	Profit / revenue ratio		23%	0%	-19%	-70%	-103%	-127%
B13	Cash flow	Tk	128,343,920	112,927,581	86,469,974	50,605,292	155,025,090	164,339,083

* Unit electricity cost is assumed to increase by 20% p.a. from the 2nd year. Electricity cost also increases in proportion to water production increase.

4.2 Major Assumptions

Other than the assumptions used in the base case scenario setting, there are assumptions required to constitute the revenue and expenditure plan. Major assumptions of such kind are divided into three categories, (i) water supply, (ii) depreciation and (iii) collection efficiency and period. They are summarized in the tables below.

(1) Water Supply

No.	Indicator	Unit	2010/11 (Past year)	2011/12 (1st year)	2012/13 (2nd year)	2013/14 (3rd year)	2014/15 (4th year)	2015/16 (5th year)
E1	Number of active (non-disconnected) connections	Nos.	45,570	50,000	56,000	62,000	69,000	76,000
E2	Non Revenue Water	%	28	28	27	27	26	26
E3	Billable water volume	MLD	135	149	151	151	254	321
E4	Number of licensed tubewells	Nos.	1,872	2,246	2,246	2,246	1,123	1,123
E5	Tubewell license fee (average)	Tk/license/year	24,275	19,420	19,420	19,420	29,130	29,130

(2) Depreciation

No.	Indicator	Unit	2010/11 (Past year)	2011/12 (1st year)	2012/13 (2nd year)	2013/14 (3rd year)	2014/15 (4th year)	2015/16 (5th year)
C97	Total value of completed projects during year	Tk	0	0	0	15,100,000,000	10,784,621,600	5,180,000,000
F1	Value of depreciable assets - year end	Tk	2,014,073,062	2,014,073,062	2,014,073,062	17,114,073,062	27,898,694,662	33,078,694,662
F2	Depreciation	Tk	55,404,000	50,351,827	50,351,827	239,101,827	562,659,597	762,217,367

(3) Collection efficiency and period

No.	Indicator	Unit	2010/11 (Past year)	2011/12 (1st year)	2012/13 (2nd year)	2013/14 (3rd year)	2014/15 (4th year)	2015/16 (5th year)
B1	Water revenue	Tk	406,098,611	471,890,906	502,367,194	527,485,554	929,463,045	1,231,653,262
A7	Revenue collection efficiency	%	99	95	95	95	95	95
G1	Collection	Tk	401,585,355	448,296,361	477,248,834	501,111,276	882,989,893	1,170,070,598
G2	Increase in water bills receivable	Tk	4,513,256	23,594,545	25,118,360	26,374,278	46,473,152	61,582,663
G3	Accounts receivable - closing balance	Tk	222,472,712	246,067,257	271,185,617	297,559,895	344,033,047	405,615,710
G4	Collection period	days	200	190	197	206	135	120

5 CAPITAL PROJECT INVESTMENT PLAN

5.1 Project Schedule

CWASA's investment in capital projects (disbursement basis) of coming five years are planned as follows.

	2011/12 (1st year)	2012/13 (2nd year)	2013/14 (3rd year)	2014/15 (4th year)	2015/16 (5th year)	Total
Investment (Tk. lac)	15,329	87,161	103,338	52,862	55,000	313,690

The total investment in the 5 years amounts to Tk. 31 billion. The breakdown of the capital project amounts are presented in the table below. The schedule covers up to the 9th year as some projects which start in the 5th year may complete as late as in the 9th year. If the capital project is a water supply project, the water production capacity that will be materialized by the project is also shown. The existing capital facilities are also listed even though there will be no capital improvement project anticipated as the capacity data is required in planning the entire water production.

No.	Project	Finance	source		Unit	2010/11 (Past year)	2011/12 (1st year)	2012/13 (2nd year)	2013/14 (3rd year)	2014/15 (4th year)	2015/16 (5th year)	(6th year)	(7th year)	(8th year)	(9th year)
C1	Kalurghat IRP			Disbursement	Tk	0	0	0	0	0	0	0	0	0	0
C2				Capacity	MLD	68	68	68	68	68	68	68	68	68	68
C3				Production	MLD	62	62	62	62	62	62	62	62	62	62
C4	Mohara WTP			Disbursement	Tk	0	0	0	0	0	0	0	0	0	0
C5				Capacity	MLD	90	90	90	90	90	90	90	90	90	90
C6				Production	MLD	83	83	83	83	83	83	83	83	83	83
C7	Deep tube wells (direct distribution to users)			Disbursement	Tk	0	0	0	0	0	0	0	0	0	0
C8				Capacity	MLD	46	46	46	46	46	46	46	46	46	46
C9				Production	MLD	42	42	42	42	42	42	42	42	42	42
C10	Deep tube wells (supply to Kalurghat)			Disbursement	Tk	0	0	0	0	0	0	0	0	0	0
C11				Capacity	MLD	74	74	74	74	74	74	74	74	74	74
C12				Production	MLD	66	66	66	66	66	66	66	66	66	66
C13	Emergency water supply			Disbursement	Tk										
C14		Grant	100%	Capacity	MLD		20	20	20	20	20	20	20	20	20
C15		Others	0%	Production	MLD		20	20	20	20	20	20	20	20	20
C16	Karnaphuli Phase 1			Disbursement	Tk	2,605,600,000	454,414,000	6,019,993,000	6,019,993,000						
C17		JICA loan	66%	Capacity	MLD					136	136	136	136	136	136
C18		GOB loan	34%	Production	MLD					136	136	136	136	136	136
C19	Mohara WTP Extension			Disbursement	Tk	0	0	0	0	2,590,000,000	2,590,000,000	0	0	0	0
C20		Foreign loan	80%	Capacity	MLD	0	0	0	0	0	0	90	90	90	90
C21		GOB loan	20%	Production	MLD	0	0	0	0	0	0	83	83	83	83
C22	Mohara Kalughat rehabilitation			Disbursement	Tk		0								
C23		JDCF grant	100%	Capacity	MLD										
C24		Others	0%	Production	MLD										
C25	Modunagaht (CWSISP)			Disbursement	Tk		1,078,462,160	2,696,155,400	4,313,848,640	2,696,155,400					
C26		WB loan	80%	Capacity	MLD						90	90	90	90	90
C27		GOB loan	20%	Production	MLD						90	90	90	90	90
C28	PANI (NRW reduction)			Disbursement	Tk		0	0							
C29		JICA Grant	98%												
C30		GOB grant	2%												
C31	Karnaphuli Phase 2			Disbursement	Tk						1,510,000,000	3,775,000,000	6,040,000,000	3,775,000,000	
C32		JICA loan	80%	Capacity	MLD										136
C33		GOB loan	20%	Production	MLD										136
C34	Management & Service Improvement			Disbursement	Tk				0	0					
C35		ADB grant	90%												
C36		GOB grant	10%												
C37	Bandaljuri Phase 1			Disbursement	Tk							656,200,000	1,640,500,000	2,624,800,000	1,640,500,000
C38		Koica loan	80%	Capacity	MLD										100
C39		GOB loan	20%	Production	MLD										100
C40	Storm water Drainage			Disbursement	Tk						500,000,000	1,000,000,000	700,000,000	800,000,000	
C41		Foreign loan	80%												
C42		GOB loan	20%												
C43	Chittagong Sewerage Project			Disbursement	Tk						500,000,000	2,000,000,000	2,500,000,000	2,500,000,000	1,500,000,000
C44		Foreign loan	80%												
C45		GOB loan	20%												
C46	Pipeline Rehabilitation Project			Disbursement	Tk						200,000,000	500,000,000	700,000,000	800,000,000	800,000,000
C47		Foreign loan	80%												
C48		GOB loan	20%												
C49	Pipeline Extension Project			Disbursement	Tk						200,000,000	700,000,000	700,000,000	450,000,000	450,000,000
C50		Foreign loan	80%												
C51		GOB loan	20%												
C96	Total new investment during year				Tk	2,605,600,000	1,532,876,160	8,716,148,400	10,333,841,640	5,286,155,400	5,500,000,000	8,631,200,000	12,280,500,000	10,949,800,000	4,390,500,000
C97	Total value of completed projects during year				Tk	0	0	0	15,100,000,000	10,784,621,600	5,180,000,000	0	0	18,100,000,000	21,062,000,000
C98	Total water capacity				MLD	203	223	223	223	359	449	539	539	539	775
C99	Total production (distributable water)				MLD	187	207	207	207	343	433	516	516	516	752

5.2 Project Description

Capital expenditures shown in the above table include ongoing projects as well as future planned projects. The project descriptions are shown below.

1) Karnaphuli water supply project – phase 1

This project dates back to 2006 when the Exchange of Notes regarding the yen loan financing was signed. It was expected that it would be completed by 2012, but due to the complications in land acquisition, the project could not be started for a long time. After the present government took office, the land acquisition was successfully completed. The principle three parts of project are (i) intake and water treatment plant (136 MLD capacity), (ii) laying of pipe line, and (iii) construction of water reservoir. The process of appointing contractors for the three package were completed.

2) Karnaphuli water supply project - phase 2

This project will double the Karnaphuli WTP capacity by adding another system of 136MLD production capacity. Funding by JICA is expected but not yet committed.

3) Extension of Mohara water supply project

The project intends to construct another WTP in the same site where the existing Mohara WTP is located. The project was planned to be completed in 2009, starting from 2003. Due to the matter of court case relating to a component of the project against the contractors, the project was not completed in time. The case has been solved, being in favour of CWASA. Revised DPP is under process.

4) Chittagong water supply improvement and sanitation project (CWSISP)

Main portion of the project is to increase the water supply by constructing a new WTP at Modunaghat, extend water distribution system, and provide sanitation service to urban slums. The World Bank will finance this project. According to the decision of PEC, DPP has been prepared.

5) Bhanderjuri water supply project

As outlined in the Master Plan prepared under KOICA funding, a 100 MLD plant is proposed to serve the left bank of Karnaphuli river. The left bank area includes EPZ where Korean capital fertilizer factory is operating. This will be implemented as phase 1. Also included in this service area are new city area where middle and upper class houses are being developed. The water supply to this area will be done in the 2nd phase. Preparation of PDPP was completed and had been sent to Economic Relation Division.

6) Chittagong sewerage project

The sewerage Master Plan indicate needs of constructing two WWTPs on the right bank of Karnaphule river and another two in the left bank. The priority works will be the WWTP to be located on the right bank of Karnaphui. PDPP had been sent to ERD.

7) Pipe line rehabilitation project

The project aims at replacing old pipeline and reducing NRW. The Preparation of PDPP was completed and had been sent to Economic Relation Division.

8) Pipe line extension project

The Preparation of PDPP was completed and had been sent to Economic Relation Division.

9) Storm water drainage project

The Preparation of PDPP was completed and had been sent to Economic Relation Division.

6 DEBT SERVICE PLAN

The debt service plan is prepared to ensure that CWASA will remain financially sound during coming five years. Debt serviceability is indicated by cash positions after repayment of loans and payment of interests. Under a sound debt service plan, the cash position becomes positive.

6.1 Debt Service Schedule

CWASA's interest payment, provision for interest payment, repayment of loan and end-year loan balance in coming five years are projected as follows.

(Tk. million)

	2011/12 (1st year)	2012/13 (2nd year)	2013/14 (3rd year)	2014/15 (4th year)	2015/16 (5th year)
Interest payment	24	23	23	23	23
Provision for interest payment	121	194	345	832	1,367
Principal repayment	35	0	0	0	0
Loan balance (year end)	4,723	7,874	18,208	29,514	35,014

The breakdown of the debt service by project loans is shown below.

No.	Loan	Finance source			Unit	2010/11 (Past year)	2011/12 (1st year)	2012/13 (2nd year)	2013/14 (3rd year)	2014/15 (4th year)	2015/16 (5th year)
D1	IWSRSP-1st (GoB)			Balance - year end	Tk	248,725,000	248,725,000	248,725,000	248,725,000	248,725,000	248,725,000
D2		GOB loan	100%	Interest payment	Tk	9,949,000	9,949,000	9,949,000	9,949,000	9,949,000	9,949,000
D3		Repay. year	?	Provision for int. pay.	Tk						
D4		Int. rate	4%	Reversal of provision	Tk						
D5				Principal repayment	Tk	-	-	-	-	-	-
D6	IWSRP-3rd (GoB)			Balance - year end	Tk	336,207,000	336,207,000	336,207,000	336,207,000	336,207,000	336,207,000
D7		GOB loan	100%	Interest payment	Tk		13,448,280	13,448,280	13,448,280	13,448,280	13,448,280
D8		Repay. year	?	Provision for int. pay.	Tk						
D9		Int. rate	4%	Reversal of provision	Tk						
D10				Principal repayment	Tk	-	-	-	-	-	-
D11	IDA Loan 1st Phase			Balance - year end	Tk	2,115,255	-	-	-	-	-
D12	Kalurghat IRP	GOB loan	100%	Interest payment	Tk	317,288	84,610	-	-	-	-
D13		Repay. year	?	Provision for int. pay.	Tk						
D14		Int. rate	4%	Reversal of provision	Tk						
D15				Principal repayment	Tk	2,115,255	2,115,248	-	-	-	-
D16	IDA Loan 2nd Phase			Balance - year end	Tk	32,456,856	-	-	-	-	-
D17	Mohara WTP	GOB loan	100%	Interest payment	Tk	13,695,063	1,298,274	-	-	-	-
D18		Repay. year	?	Provision for int. pay.	Tk						
D19		Int. rate	4%	Reversal of provision	Tk						
D20				Principal repayment	Tk	60,361,103	32,456,856				
D21	Mohara Kalughat rehabilitation			Balance - year end	Tk	-	0	0	0	0	0
D22		JDCF grant	100%	Interest payment	Tk		-	-	-	-	-
D23		Repay. year	0	Provision for int. pay.	Tk						
D24		Int. rate	0%	Reversal of provision	Tk						
D25				Principal repayment	Tk	-	-	-	-	-	-
D26	Emergency water supply			Balance - year end	Tk	0	0	0	0	0	0
D27		Grant	100%	Interest payment	Tk						
D28		Repay. year	0	Provision for int. pay.	Tk						
D29		Int. rate	0%	Reversal of provision	Tk						
D30				Principal repayment	Tk						
D31				Balance - year end	Tk	0	0	0	0	0	0
D32		Others	0%	Interest payment	Tk						
D33		Repay. year	0	Provision for int. pay.	Tk						
D34		Int. rate	0%	Reversal of provision	Tk						
D35				Principal repayment	Tk						
D36	Karnaphuli Phase 1			Balance - year end	Tk	1,628,100,000	2,010,014,000	2,309,927,240	6,283,122,620	10,256,318,000	10,256,318,000
D37		JICA loan	66%	Interest payment	Tk						
D38		Repay. year	15	Provision for int. pay.	Tk		81,405,000	100,500,700	115,496,362	314,156,131	512,815,900
D39		Int. rate	5%	Reversal of provision	Tk						
D40				Principal repayment	Tk	-	-	-	-	-	-
D41				Balance - year end	Tk	977,500,000	1,050,000,000	1,204,500,760	3,251,298,380	5,298,096,000	5,298,096,000
D42		GOB loan	34%	Interest payment	Tk						
D43		Repay. year	15	Provision for int. pay.	Tk		39,100,000	42,000,000	48,180,030	130,051,935	211,923,840
D44		Int. rate	4%	Reversal of provision	Tk						
D45				Principal repayment	Tk	-	-	-	-	-	-
D46	Mohara WTP Extension			Balance - year end	Tk	0	0	0	0	2,072,000,000	4,144,000,000
D47		Foreign loan	80%	Interest payment	Tk						
D48		Repay. year	15	Provision for int. pay.	Tk						103,600,000
D49		Int. rate	5%	Reversal of provision	Tk						
D50				Principal repayment	Tk						
D51				Balance - year end	Tk	0	0	0	0	518,000,000	1,036,000,000
D52		GOB loan	20%	Interest payment	Tk						
D53		Repay. year	15	Provision for int. pay.	Tk						20,720,000
D54		Int. rate	4%	Reversal of provision	Tk						
D55				Principal repayment	Tk						
D56	Modunagaht (CWSISP)			Balance - year end	Tk	0	862,769,728	3,019,694,048	6,470,772,960	8,627,697,280	8,627,697,280
D57		WB loan	80%	Interest payment	Tk						
D58		Repay. year	15	Provision for int. pay.	Tk			43,138,486	150,984,702	323,538,648	431,384,864
D59		Int. rate	5%	Reversal of provision	Tk						
D60				Principal repayment	Tk	-	-	-	-	-	-
D61				Balance - year end	Tk	0	215,692,432	754,923,512	1,617,693,240	2,156,924,320	2,156,924,320
D62		GOB loan	20%	Interest payment	Tk						
D63		Repay. year	15	Provision for int. pay.	Tk			8,627,697	30,196,940	64,707,730	86,276,973
D64		Int. rate	4%	Reversal of provision	Tk						
D65				Principal repayment	Tk	-	-	-	-	-	-
D66	PANI (NRW reduction)			Balance - year end	Tk	0	0	0	0	0	0
D67		JICA Grant	98%	Interest payment	Tk						
D68		Repay. year	0	Provision for int. pay.	Tk						
D69		Int. rate	0%	Reversal of provision	Tk						
D70				Principal repayment	Tk						
D71				Balance - year end	Tk	0	0	0	0	0	0
D72		GOB grant	2%	Interest payment	Tk						
D73		Repay. year	0	Provision for int. pay.	Tk						
D74		Int. rate	0%	Reversal of provision	Tk						
D75				Principal repayment	Tk						

						2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
No.	Loan	Finance source			Unit	(Past year)	(1st year)	(2nd year)	(3rd year)	(4th year)	(5th year)
D76	Karnaphuli Phase 2			Balance - year end	Tk	0	0	0	0	0	1,208,000,000
D77		JICA loan	80%	Interest payment	Tk						
D78		Repay. year	15	Provision for int. pay.	Tk					0	0
D79		Int. rate	5%	Reversal of provision	Tk						
D80				Principal repayment	Tk						
D81				Balance - year end	Tk	0	0	0	0	0	302,000,000
D82		GOB loan	20%	Interest payment	Tk						
D83		Repay. year	15	Provision for int. pay.	Tk					0	0
D84		Int. rate	4%	Reversal of provision	Tk						
D85				Principal repayment	Tk						
D86	Management & Service Improvement			Balance - year end	Tk	0	0	0	0	0	0
D87		ADB grant	90%	Interest payment	Tk						
D88		Repay. year	0	Provision for int. pay.	Tk						
D89		Int. rate	0%	Reversal of provision	Tk						
D90				Principal repayment	Tk						
D91				Balance - year end	Tk	0	0	0	0	0	0
D92		GOB grant	10%	Interest payment	Tk						
D93		Repay. year	0	Provision for int. pay.	Tk						
D94		Int. rate	0%	Reversal of provision	Tk						
D95				Principal repayment	Tk						
D96	Bandaljuri Phase 1			Balance - year end	Tk	0	0	0	0	0	0
D97		Koica loan	80%	Interest payment	Tk						
D98		Repay. year	15	Provision for int. pay.	Tk						
D99		Int. rate	5%	Reversal of provision	Tk						
D100				Principal repayment	Tk			-	-	-	-
D101				Balance - year end	Tk	0	0	0	0	0	0
D102		GOB loan	20%	Interest payment	Tk						
D103		Repay. year	15	Provision for int. pay.	Tk						
D104		Int. rate	4%	Reversal of provision	Tk						
D105				Principal repayment	Tk						
D106	Storm water Drainage			Balance - year end	Tk	0	0	0	0	0	400,000,000
D107		Foreign loan	80%	Interest payment	Tk						
D108		Repay. year	15	Provision for int. pay.	Tk						
D109		Int. rate	5%	Reversal of provision	Tk						
D110				Principal repayment	Tk	-	-	-	-	-	-
D111				Balance - year end	Tk	0	0	0	0	0	100,000,000
D112		GOB loan	20%	Interest payment	Tk						
D113		Repay. year	15	Provision for int. pay.	Tk						
D114		Int. rate	4%	Reversal of provision	Tk						
D115				Principal repayment	Tk	-	-	-	-	-	-
D116	Chittagong Sewerage Project			Balance - year end	Tk	0	0	0	0	0	400,000,000
D117		Foreign loan	80%	Interest payment	Tk						
D118		Repay. year	15	Provision for int. pay.	Tk						
D119		Int. rate	5%	Reversal of provision	Tk						
D120				Principal repayment	Tk	-	-	-	-	-	-
D121				Balance - year end	Tk	0	0	0	0	0	100,000,000
D122		GOB loan	20%	Interest payment	Tk						
D123		Repay. year	15	Provision for int. pay.	Tk						
D124		Int. rate	4%	Reversal of provision	Tk						
D125				Principal repayment	Tk	-	-	-	-	-	-
D126	Pipeline Rehabilitation Project			Balance - year end	Tk	0	0	0	0	0	160,000,000
D127		Foreign loan	80%	Interest payment	Tk						
D128		Repay. year	15	Provision for int. pay.	Tk						
D129		Int. rate	5%	Reversal of provision	Tk						
D130				Principal repayment	Tk	-	-	-	-	-	-
D131				Balance - year end	Tk	0	0	0	0	0	40,000,000
D132		GOB loan	20%	Interest payment	Tk						
D133		Repay. year	15	Provision for int. pay.	Tk						
D134		Int. rate	4%	Reversal of provision	Tk						
D135				Principal repayment	Tk	-	-	-	-	-	-
D136	Pipeline Extension Project			Balance - year end	Tk	0	0	0	0	0	160,000,000
D137		Foreign loan	80%	Interest payment	Tk						
D138		Repay. year	15	Provision for int. pay.	Tk						
D139		Int. rate	5%	Reversal of provision	Tk						
D140				Principal repayment	Tk	-	-	-	-	-	-
D141				Balance - year end	Tk	0	0	0	0	0	40,000,000
D142		GOB loan	20%	Interest payment	Tk						
D143		Repay. year	15	Provision for int. pay.	Tk						
D144		Int. rate	4%	Reversal of provision	Tk						
D145				Principal repayment	Tk	-	-	-	-	-	-
D200	Total Loans			Balance - year end	Tk	3,225,104,111	4,723,408,160	7,873,977,560	18,207,819,200	29,513,967,600	35,013,967,600
D201				Interest payment	Tk	23,961,351	24,780,164	23,397,280	23,397,280	23,397,280	23,397,280
D202				Provision for int. pay.	Tk	0	120,505,000	194,266,884	344,858,035	832,454,444	1,366,721,577
D203				Reversal of provision	Tk	0	0	0	0	0	0
D204				Principal repayment	Tk	62,476,358	34,572,104	0	0	0	0

6.2 Terms of Loans

Among loans shown above, the first five loans (IWSRSP 1st through Mohara) have a interest rate of 4% p.a. The repayment is not requested by GOB, which is the lender.

The rest of loans are related with future projects or projects that have started disbursement recently. These loans will be on-lent by GOB as subsidiary loans. According to the GOB guideline, terms of on-lent loan to CWASA, if the original loan is denominated in foreign currency, will have a 5% interest rate p.a., and repayment period of 20 years (inclusive of 5 year grace period).

6.3 Debt Rescheduling and Restructuring

For the existing five loans, CWASA has not been repaying the principal. This is because GOB allows CWASA not to repay the loan. Instead the interests are being paid. Practically the loans have been equalized.

Regarding the new loans, GOB has not yet decided such debt restructuring or rescheduling as applied to the existing loans. However, it is obvious that CWASA's cash position will be a huge deficit if the terms of loan set in the guideline are applied. The Business Plan therefore assumes that CWASA will be granted five year grace period of interest payment during which CWASA can reserve provision for interest payment.

7 ORGANIZATIONAL PLAN

Two manpower targets are set using organizational indicators which are (i) the number of permanent employees and (ii) the number of employees per thousand connections. The targets are shown in the table below. The number of active water connections and the water production are auxiliary indicators that can be used to evaluate the manpower indicators.

			2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
No.	Indicator	Unit	(Past year)	(1st year)	(2nd year)	(3rd year)	(4th year)	(5th year)
A3	Number of permanent employees *1	Nos.	519	620	740	750	750	760
A2	Number of employees per 1000 connections	Nos	11.4	12.4	13.2	12.1	10.9	10.0
E1	Number of active (non-disconnected) connections	Nos.	45,570	50,000	56,000	62,000	69,000	76,000
C99	Total production (distributable water)	MLD	187	207	207	207	343	433
	*1: Number of actual on-roll employees out of sanctioned 826 posts.							

A detailed organizational plan is being prepared with assistance provided under the Institutional Development Consultancy Services under Karnaphuli Water Supply Project. The organization plan is scheduled to be presented in 2012 and incorporated in the next year business plan.

Notes on Indicators

(CWASA Financial Model - Version 2.06)

No.	Indicator	Definition and Assumption
A1	Operating Ratio	Operating ratio = Total expenses ÷ total operating revenues. Expenses include depreciation and financial costs. Operating revenues include interest income. The indicator is automatically computed and shown as a result of other data entries.
A2	Employees per 1000 connections	Number of employees per 1000 connections = number of permanent employees ÷ (total active connections x 1,000). Non-permanent employees and outsourced staffs are not included. This indicator is automatically computed and shown as a result of other data entries.
A3	Number of permanent employees	The past year number should be actual or budgeted number. Numbers for 1st year through 5th year can be planner's assumption. Only the numbers of actual on-roll employees out of sanctioned posts are shown.
A4	Permanent staff ratio	Permanent staff ratio = number of permanent staffs ÷ number of total staffs x 100. Total staffs include permanent, non-permanent, and outsourced staffs. Non-core works can be performed by non-permanent staffs or outsourcing. The past year number should be actual or budgeted number. Numbers of 1st to 5th year are planner's assumption.
A5	Average effective tariff	Average effective tariff = total billing ÷ billable water volume. The past year number is automatically computed and shown as a result of other data entries. Numbers for the 1st year through 5th year are planner's assumption. In "Sample" worksheet, the planner assumes that the average tariff can be raised by 5% a year.
A6	Unit production cost	Unit production cost is expressed as per cubic meter production cost. This is calculated as (Total expenses ÷ Total production volume). Depreciation and financial cost are included in the total cost. The past year number should be actual or budgeted amount. Numbers of 1st to 5th year are automatically computed and shown as a result of other data entries.
A7	Revenue collection efficiency	Revenue collection efficiency = collection ÷ water revenue x 100. Revenue collection efficiency is considered only for water revenue which is the major source of CWASA revenue. CWASA's existing billing software system in 2012 cannot classify accounts receivable by age. Therefore the revenue collection efficiency can be shown merely as (total collection during the year ÷ total billing during the year). The past year number should be actual or assumed on the basis of latest available data. Empirically the collection efficiency of CWASA hovers between 90% and 100%. In "Sample" worksheet, numbers of the 1st to the 5th year are assumed by planner as 95%.
B1	Water revenue	Water revenue is defined as (Billable Water Volume x Average effective tariff). The past year number should be actual or budgeted amount. Numbers of 1st to 5th year are automatically computed and shown as a result of other data entries.
B2	Tube well license revenue	Tube well license revenue is expressed as (average tube well license fee x number of licensed tube wells). The past year number should be actual or budgeted amount. Numbers of 1st to 5th year are automatically computed and shown as a result of other data entries.
B3	Interest revenue	This is the interest on deposits such as FDRs. The past year number is actual or budgeted amount. Numbers of 1st to 5th year are planner's assumption.
B4	Other revenue	The past year number should be actual or budgeted amount. The numbers of 1st to 5th year are planner's assumption. In "Sample" worksheet, the planner assumes that other revenue is computed as 12% x (water revenue and tube well license revenue), which is derived from historical data.

B6	Personnel Cost	The personnel cost includes, permanent staffs, non-permanent staffs and outsourcing. The past year number should be actual or budgeted amount. Numbers of 1st to 5th year are planner's discretionary assumption. In "Sample" worksheet, the planner assumes that the personnel cost per employee will increase by 5% p.a. Increase of the number of employees also proportionately raises this cost.
B7	Electricity Cost	The past year number should be actual or budgeted amount. Numbers of 1st to 5th year are planner's assumption. The 1st year number has been entered as an estimate as of May 2012. In "Sample" worksheet, the planner assumes that the unit cost will increase by 20% p.a. Increase of the water production also proportionately raises this cost.
B8	Chemicals	The past year number should be actual or budgeted amount. Numbers of 1st to 5th year are planner's assumption. In "Sample" worksheet, the planner assumes that the unit cost will increase by 5% p.a. Increase of the water production also proportionately raises this cost.
B9	Other operating cost	The past year number should be actual or budgeted amount. Numbers of 1st to 5th year are assumption. In "Sample" worksheet, the planner assumes that the unit cost will increase by 5% p.a. Increase of the water production proportionately raises this cost.
B11	Gross profit	This signifies the difference between total revenue and total expenditure. Here the deductions like taxes, contribution to the national exchequer and other appropriations, if so required, are ignored. The gross profit is a quick indicator to show the profitability of CWASA and helps to control expenditures.
B12	Profit / Revenue ratio	This is defined as gross profit ÷ total revenue x 100.
B13	Cash flow	This cash flow is an indicator to know the financing position of CWASA. The cash flow is computed at (water revenue on the collection basis + other revenues – total expenditure – loan repayment + depreciation).
C1-C51	Investment Plan	"Disbursement" data means capital project cost projection during the planning period. This is not bound only to water supply project. Sewerage, drainage, human development projects should be included if their disbursement are expected to start by the 5th year. Existing water production facilities (WTPs and DTWs) may not need additional capital investment such as large-scale repair or pump replacement. In such case, the capital investment cost should be projected as zero and shown here. If a project is grant, the disbursement does not occur therefore no amount is shown here. "Capacity" data means rated water production capacity that is associated with a water production facility. If an investment project has nothing to do with water production, this data is not shown. But if existing water supply facilities have no investment plan for next 5 years, this data is needed to clarify the total capacity. "Production" data means water actually produced by facility. If an investment project is not related with water production, this data is not shown. But if existing water supply facilities have no investment plan for next 5 years, this data is needed to clarify the total production. Major data sources of capital investment plan are (i) Project Directors for ongoing projects, (ii) Master plan or PDPPs for forthcoming projects and (iii) annual development project application. There are often cases where total investment cost is predictable but the disbursement timing and amount are difficult to tell. In such case, the planner can only estimate the disbursement duration and timing. If that is a 2-year disbursement project, the disbursement distribution can be assumed as 50% (1st year) and 50% (2nd year). If the project has a 3-year disbursement period, the distribution can be 10% (1st year), 50% (2nd year) and 40% (3rd year). If the project has a 4-year disbursement period, the ratio can be (10% : 25% : 40% : 25%). If 5-year period, (10% : 20% : 25% : 25% : 20%) is regarded likely.

C96	Total new investment during year	This is the year wise summation of the new investment amount, not only of water supply but also sewerage and other capital projects. The investment amount is on the disbursement basis, meaning that grant projects show zero in the amounts.
C97	Total value of completed projects during year	Some new projects are expected to be completed in certain year. We assume that the new capital project assets are capitalized at this value and become depreciable in the year of construction completion.
C98	Total water capacity	This is the total production capacity. The capacity corresponding to water from DTWs which go to WTP for treatment should not be included here. Because if it is included, it will be double counting. If water of DTWs directly goes to users instead of being sent to WTP, the production capacity corresponding to such water should be included.
C99	Total production (distributable water)	Distributable water means water input to the CWASA distribution system. Distributable water is expressed as (Water produced at Surface WTP + Water produced at Ground WTP + DTW water directly distributed to users). The production corresponding to water from DTWs which go to WTP for treatment should not be included here. Because if it is included, it will be double counting. If water of DTWs directly goes to users instead of being sent to WTP, the production of such water should be included. The past year number is actual or planned.
D1-D145	Debt Service Plan	Debt service plan provides four information, (i) interest payment projection, (ii) provision for interest payment, (iii) reversal of provision for interest payment and (ii) principal repayment projection. For existing loans, the principal repayment and interest payment conditions should be obtainable at CWASA. These conditions are entered here. Among the existing loans, only two i.e., IDA Loan 1st phase and IDA loan 2nd are making some repayment of loans. As per plan it appears it will be the end installment of the said projects. Excepting the two, other existing projects have no plan to make any payment during the 5 year period. For new loans which correspond to new capital projects, standard terms will be applied, that is 4% interest p.a., 5 year grace period followed by 15 year repayment period for GOB loans. In case of on-lent loans based on foreign loan, the terms are 5% interest p.a., 5 year grace period followed by 15 year repayment period. A 5 year grace period for interest payment will be granted in both GOB and foreign loans. During the grace period for interest payment, CWASA will allocate provision to cover the interest payment in future. If a project is financed by grant, the interest payment is shown as zero.
E1	No. of active connections (non-disconnected)	The past year number should be actual or planned number. Numbers of 1st to 5th year are planner's assumption.
E2	Non Revenue Water	NRW is total defined as (unbilled water ÷ billable water x 100) or (1 – billed water / billable water) x 100. The past year number should be actual or planned one. Numbers of 1st to 5th year are planner's assumption.
E3	Billable Water Volume	This is computed as total production ÷ (1 – NRW). The values are automatically computed and shown as a result of other data entry.
E4	Number of licensed tube wells	As of June 2011, the number of domestic tube wells is 946, and that of non-domestic is 926. This is used as the past year data. CWASA expects the number of registered tubewells increases in the 1st to 3rd years (before Karnaphuli WTP is commissioned) as a result of the tubewell license fee reduction to encourage the revelation of hidden tubewells. However, after Karnaphuli completion, the number of tubewells should be decreased due to new water supply. The numbers in "Sample" worksheets reflect these assumptions.

E5	Tube well license fee (average)	In 2010/2011, annual license fees are set at Tk15,000 for domestic and Tk33,750 for non-domestic. The number of domestic tube wells and non-domestic tube wells are respectively 946 and 926. The weighted average tube well license fee is computable from these data. The license fee is assumed to be lowered during the 1st to 3rd year period. But it will be raisable from the 4th year as CWASA wants to reduce the number of tubewells and the water from Karnaphuli WTP will become available too.
F1	Value of depreciable assets – year end	Balance of the past year is obtained from the audited report 2007/08 and thereafter value of completed projects is added. Actual balance of the past year should be used if available. When any project is completed, total disbursement are capitalized in the final year, i.e., in the year of project completion and added to the closing balance of previous year to arrive at the closing depreciable balance. As per practice of CWASA, the depreciation is calculated on the closing balance.
F2	Depreciation	The past year number should be actual or budgeted number. The 1st to 5th year numbers are calculated at 2.5% of depreciable assets. This 2.5% is suggested from CWASA historical data and also considered equivalent to the 40 year straight line depreciation rate. We consider the new capital project assets are capitalized and become depreciable in the year of construction completion or acquisition. For example, if the ending balance of depreciable assets in the past year (= beginning balance of the 1st year) is Tk. 20 million and the ending balance of depreciable assets in the first year is Tk.40 million, then the depreciation charge for the 1st year is computed as: Depreciation rate x year-round average of depreciable asset balance = 2.5% x (Tk. 20 million + Tk. 40 million) / 2 = Tk. 750,000.
G1	Collection	Collection is water revenue x revenue collection efficiency. The past year number should be actual or budgeted amount. The numbers of 1st to 5th year are automatically computed and shown as a result of other data entries.
G2	Increase in water bills receivables	This is computed as (Total water revenue - Total collection). In "Sample" worksheet, this indicator is automatically computed and shown as a result of other data entries.
G3	Accounts Receivable - closing balance	This is computed as (closing balance of previous year + Increase in water bills receivable). The past year number should be actual or budgeted amount. The numbers of 1st to 5th year are automatically computed and shown as a result of other data entries.
G4	Collection period	This is an indicator to show how many days will be needed for an average water bill to be paid. The shorter, the better. This is computed as accounts receivable closing balance ÷ (Water revenue ÷ 365). In "Sample" worksheet, this indicator is automatically computed and shown as a result of other data entries.
H1-H20	Non-financial indicators	These indicators are irrelevant in this financial model computation. However they are shown here as indicators shown in other management documents such as Performance Agreement between CWASA and Government of Bangladesh.
H1	Bill sent-out ratio	Bill sent-out ratio" is defined as "billed connection ÷ Billable connection x 100".
H2	Meter installation ratio	"Meter installation ratio" is defined as "1 - (non meter connection ÷ billable connection) x 100".
H3	Metered volume to billed volume ratio	This indicator is stipulated in Performance Agreement. However CWASA's existing computer system cannot isolate metered water volume out of billed volume. Only possible is to classify by the number of accounts. A proxy for the metered volume to billed volume could be "Functioning meter rate" which is defined as 1 - (number of average reading connection / number of billable connection).
H7	Leakage occurrence	"Leakage occurrence" is defined as (number of leakages reported during a month ÷ length of pipeline). The pipeline does not include service pipes.

H8	Water supply coverage	"Water supply coverage" is defined as (population served with piped water + population served with stand pipes) ÷ population in service area x 100.
H9	Population of Chittagong	The numbers were set by Performance Agreement.
H10	Population in CWASA service area	The numbers were set by Performance Agreement.
H11	Population served with piped water	The past year number was set by Performance Agreement. The 1st to 5th year numbers are defined as (number of connections x population per connection).
H12	Population served with stand pipes or slum water points	The numbers in "Sample" worksheet are assumed by planner on the basis of Performance Agreement.
H13	Number of standpipes	The past year number is actual. The 1st to 5th year numbers are assumed by planner.
H14	Population per connection	The past year number is automatically computed as a result of other data entries. The 1st to 5th year numbers are assumed by planner. KOIKA master plan used 25. JICA Karnaphuli F/S used 32.
H15	Population per stand pipe	The numbers are automatically computed as a result of other data entries. KOIKA master plan used 380.
H16	Water use per street hydrant	The numbers are assumed by planner. In "Sample" worksheet, the values are set rather low because the street hydrants in total are considered to be using much less water than the piped water system.
H17	Water use per capita of street hydrant users	The numbers are automatically computed as a result of other data entries.
H18	Total water consumption by street hydrants	This is defined as (number of stand pipes x unit water consumption by stand pipes). The numbers are automatically computed as a result of other data entries.
H19	Total water consumption of piped water system	This is defined as (Billable water volume – water consumption by stand pipes). The numbers are automatically computed as a result of other data entries.
H20	Water use per capita of piped water users	This is defined as (total water consumption by piped water ÷ number of active connections x population per connection). The unit water consumption includes non-domestic water use such as industrial and commercial. The numbers are automatically computed as a result of other data entries.