

**Republic of Yemen**

**Ministry of Water and Environment**

**Technical Secretariat for  
Water Supply and Sanitation Sector Reform**

**Performance Indicator Information System**

**DRAFT Annual Report 2005**

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## 1. Introduction

During the period 2003-2005, the Technical Secretariat in collaboration with the Ministry of Water and Environment (Planning Department) and Yemen Soft developed the Performance Indicator Information System (PIIS). The initial version was installed mid 2004 and more than 100 operators were trained. In 2005 the PIIS was revised and new basic data and performance indicators were added upon the request of the users. Installation of the revised version took place in May 2005 in 9 local corporations (including 4 branches of Mukallah LC), 10 autonomous utilities, and in the Ministry and NWSA. A refresher training course was carried out in which more than 60 people participated.

Table 1. Overview of locations with PIIS

Local Corporations	Branches	Autonomous Branches
Sana'a	Ad Dis	Zabid
Hudeidah	Al Hami	Mansouria
Taiz	Al Reida	Bajil
Aden	Ghail	Bayt Al Faqih
Ibb		Al Mokha
Mukallah		Yarim
Wadi HAdramawt (Seiyun)		Dhamar
Hajjah		Sadah
Al Baydah (Rada'a)		Amran
		Al Mahweet

This report aims to illustrate the performance of the above mentioned utilities for certain key-indicators. A major problem in the use of the PIIS is the unreliability and incompleteness of the manually entered basic data and their respective indicators. Therefore, this report focuses on those indicators, which are produced through basic data directly extracted from the accounting, billing and payroll systems in the utilities.

Due to time constraints, it does not aim to be complete in its overview of indicators and the Planning Department is advised to extend the report with additional indicators, especially after completion of the data-collection for the newly added basic data and indicators as well as the completion and correction of many of the manually entered basic data.

**The planning department is advised to continue following the utilities to send in complete files of the basic data (both the "old ones" as well as the newly added basic data). Especially basic data relating to water quality (water distributed and effluent) are incomplete, as well as indicators relating to water production, effluent production, capital costs (depreciation), investments and training are incomplete or incorrect.**

Annex 1 provides a complete list of all basic data and indicators which are currently included in the PIIS.

The following indicators are discussed in the report (table 2).

Table 2. Key-indicators

Personnel	A.1.1 Number of staff per 1000 water connections A.1.2 Number of staff per 1000 water and sanitation connections
Operations	B.1 Non revenue water
Finance	E.2.1 Operational actual cost coverage E.2.2 Operational billed cost coverage E.3 Personnel costs per total operational costs E.4 Energy cost per total operational costs
Billing & Customer	F.1 Collection efficiency F.2 Amounts receivable as debt period F.3 Water expenses for first 5m <sup>3</sup> per poor household income F.4 Sanitation expenses for first 5m <sup>3</sup> per poor household income
Water consumption	G.1 Average total water consumption G.2 Average total domestic water consumption
Coverage	H.3 Population served with water supply services H.4 Population served with sanitation services H.8 Number of water connections H.9 Number of sanitation connections

This report hopes to give a first glance at the strength of the PIIS for comparative competition, benchmarking and public disclosure of performance indicators. Due to time constraints a comprehensive analysis, conclusions and recommendations are not included in this report.

## 2. Personnel

The number of staff per 1000 water connections (A.1.1) and the number of staff per 1000 water and sanitation connections is a measure for the staffing situation of the utility. Results by the end of 2005 are indicated in Table 3.

The national result (i.e. the weighted average for the locations mentioned in table 1) is 9.0 persons per 100 water and sanitation connections (A.1.2). Utilities which are performing better as the national average are: Hudeidah, Ibb, Sana'a, Taiz, Bayt Al Faqih, Yarim, Zabid and a very well performance for Rada'a. Bad performers are Sadah, Hajjah, Aden, Mukallah (and branches), Seiyun, Al Mahweet, Al Mokha.

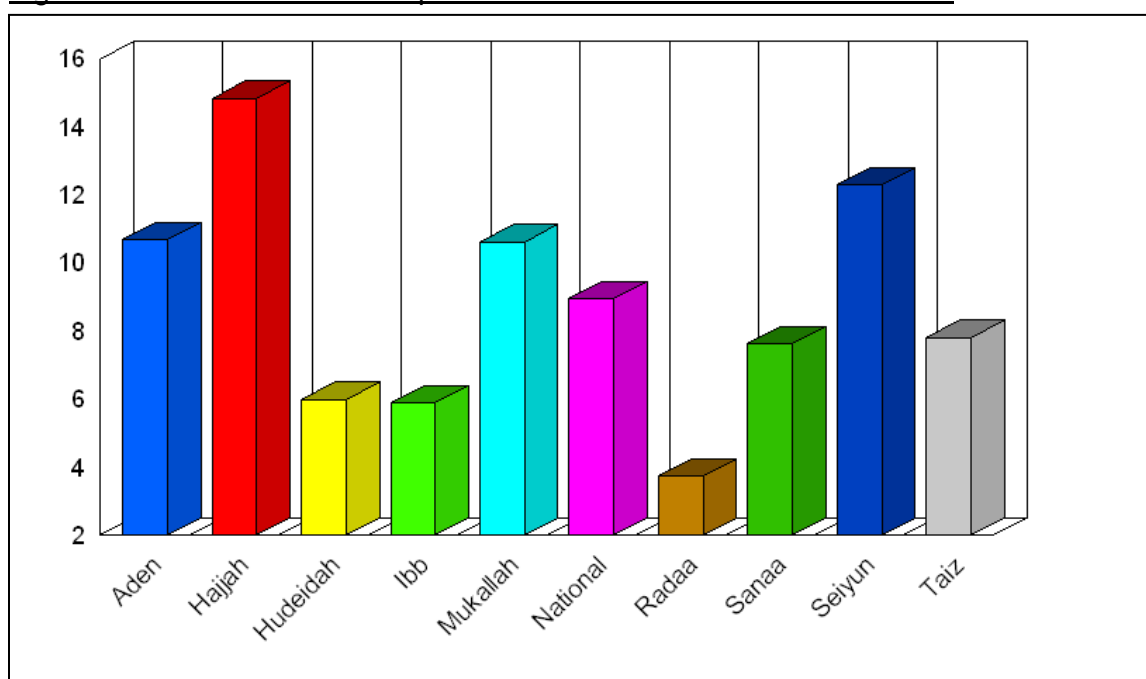
Efficiencies of scale are expected to be reached for bigger utilities providing water and sanitation services. For setting benchmarks, this issue should be taking into account, as well as planned investments to expand the network (while keeping the staff numbers constant).

Quarterly figures for A.1.1 and A.1.2 as well as the underlying quarterly basic data (BIL2, BIL3, PAY1, PAY51) can be found in Annex 2. It should be mentioned that the data for PAY1 and PAY51 still need to be completed as this was part of the revision for the PIIS. However it will not change the overall performance very much.

Table 3. End of 2005 figures for A.1.1 and A.1.2

	A.1.1: no. of staff per 1000 water connections	A.1.2: no. of staff per 1000 water and sanitation connections
	no	no
Aden	19.9	10.7
Hajjah	23.3	14.8
Hudeidah	9.5	6.0
Ibb	10.6	5.9
Mukallah	17.1	10.6
Sanaa	13.7	7.6
Seiyun	12.4	12.3
Taiz	13.2	7.8
Amran	18.4	10.8
Bayt Al Faqih	6.3	6.3
Ad Dis	14.0	14.0
Dhamar	15.3	9.5
Ghail	15.0	15.0
Al Mahweet	15.5	13.0
Mansouria	9.4	9.4
Al Mokha	13.2	13.2
Radaa	7.2	3.7
Al Reida	14.6	14.6
Sadah	23.6	23.6
Al Hami	11.8	11.8
Yarim	12.1	6.6
Zabid	8.2	8.2
National	14.4	9.0

Figure 1. A.1.2 Number of staff per 100 water and sanitation connections



### 3. Operations

The non-revenue water in the PIIS includes both physical leakage as well as administrative losses (B.1). It will depend a lot on the status of the network, the maintenance and the prevention of illegal connections. Table 4 present the results for Non-revenue water for those utilities which have complete data sets for 2005. Good performers are Hajjah, Ibb, Bayt Al Faqih and Rada'a. Bad performers are Aden, Sana'a and Mukallah (and branches).

Quarterly figures for B.1 as well as the underlying quarterly basic data (BIL6, BIL7) can be found in Annex 2. Due to the missing data no national figure is given.

Table 4. Non-revenue water for 2005

<b>B.1: Non revenue water</b>	
	<b>%</b>
<b>Aden</b>	34.7
<b>Hajjah</b>	14.0
<b>Ibb</b>	19.2
<b>Mukallah</b>	35.8
<b>Sanaa</b>	43.4
<b>Seiyun</b>	26.7
<b>Amran</b>	22.4
<b>Bayt Al Faqih</b>	12.2
<b>Ad Dis</b>	22.7
<b>Ghail</b>	25.8
<b>Al Mahweet</b>	27.5
<b>Al Mokha</b>	23.4
<b>Radaa</b>	11.4
<b>Al Reida</b>	46.6
<b>Sadah</b>	24.3
<b>Al Hami</b>	20.2
<b>Yarim</b>	22.6

### 4. Finance

Unfortunately the data related to depreciation of assets (ACC capital costs) were not complete and/or incorrect. Therefore at this stage, only an evaluation of operational cost coverage has been made through the indicators E.2.1 Actual operational cost coverage and E.2.2 Billed operational cost coverage. The figures for 2005 are shown in Table 5.

Quarterly figures for E.2.1 and E.2.2 as well as the underlying quarterly basic data (ACC22, ACC23, and ACC24) can be found in Annex 2.

Table 5. Actual and billed operational cost coverage for 2005

	<b>E.2.1: Operational actual cost coverage</b>	<b>E.2.2: Operational billed cost coverage</b>
	<b>%</b>	<b>%</b>
<b>Aden</b>	95.6	126.3
<b>Hajjah</b>	93.9	104.3
<b>Hudeidah</b>	134.3	130.0
<b>Ibb</b>	112.4	101.7
<b>Mukallah</b>	119.1	118.2
<b>Sanaa</b>	101.7	116.6
<b>Seiyun</b>	123.9	128.4
<b>Taiz</b>	86.1	78.8
<b>Amran</b>	106.5	145.2
<b>Bayt Al Faqih</b>	146.3	154.3
<b>Bajil</b>	152.3	151.0
<b>Ad Dis</b>	117.2	115.1
<b>Dhamar</b>	108.9	120.1
<b>Ghail</b>	278.8	313.3
<b>Al Mahweet</b>	77.1	87.6
<b>Mansouria</b>	105.0	106.2
<b>Al Mokha</b>	144.2	157.5
<b>Radaa</b>	70.3	71.9
<b>Al Reida</b>	75.0	80.1
<b>Sadah</b>	84.3	97.5
<b>Al Hami</b>	121.2	119.1
<b>Yarim</b>	70.6	89.3
<b>Zabid</b>	142.8	146.5
<b>National</b>	107.1	119.2

From Table 5 it can be concluded that at the national level more than all operation costs are met through collected operational revenues (107.1%). The billed operational cost coverage is slightly higher with 119.2%. Good performers are Hudeidah, Seiyun, Bayt Al Faqih, Bajil, Al Mokha and Zabid. The branch Ghail of Al Mukallah shows a very high figure but this could be through under allocation of operational costs to Ghail.

Bad performers are Yarim, Sadah, Al Baydah (Rada'a), Al Reida branch of Al Mukallah, Al Mahweet, Taiz, Aden and Hajjah. Figure 2 shows the actual operational cost coverage of the nine LCs and the national average.

Two other financial indicators which are important to monitor for utilities are E.3 Personnel costs as part of total operational costs (closely linked to A.1.1 and A.1.2) and E.4 Energy costs as part of the total operational costs. The figures for 2005 are shown in Table 7. The national weighted average for personnel cost as part of total operational cost is 44.5%. Utilities which have lower than national average personnel costs are Al Baydah (Rada'a), Sana'a. Al Mahweet, Ibb and Hajjah. Although Al Mahweet and Hajjah are "bad performance" in terms of over-staffing, the personnel costs are still low as compared to overall operational costs.

Quarterly figures for E.3 and E.4 as well as the underlying quarterly basic data (ACC25, ACC26) can be found in Annex 2.

Figure 2. Actual operational cost coverage for LCs in 2005.

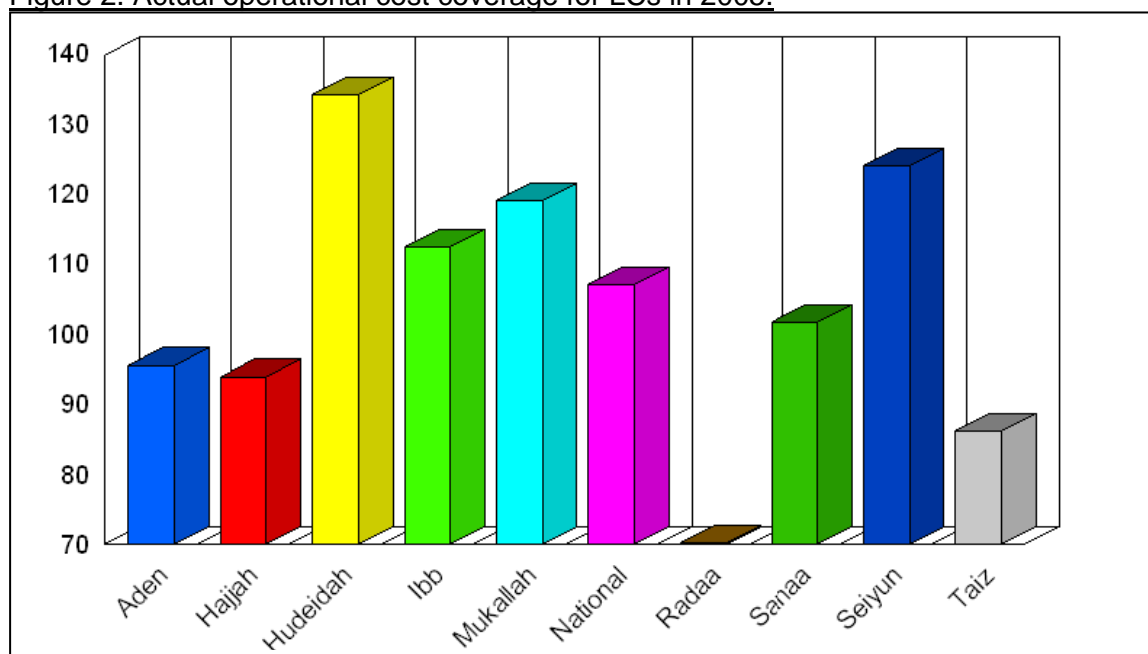


Table 6. Personnel cost and energy cost as part of total operational costs for 2005.

	<b>E.3: Personnel cost per total operational costs</b>	<b>E.4: Energy cost per total operational costs</b>
	%	%
<b>Aden</b>	48.8	25.1
<b>Hajjah</b>	44.1	41.4
<b>Hudeidah</b>	49.3	28.0
<b>Ibb</b>	43.0	41.4
<b>Mukallah</b>	50.3	16.2
<b>Sanaa</b>	30.0	51.4
<b>Seiyun</b>	51.6	22.1
<b>Taiz</b>	50.0	30.4
<b>Amran</b>	51.5	39.9
<b>Bayt Al Faqih</b>	49.6	16.0
<b>Bajil</b>	47.9	23.7
<b>Ad Dis</b>	62.1	20.0
<b>Dhamar</b>	57.9	21.4
<b>Ghail</b>	65.0	19.1
<b>Al Mahweet</b>	39.2	49.5
<b>Mansouria</b>	52.0	12.3
<b>Al Mokha</b>	56.0	14.1
<b>Radaa</b>	21.9	21.0
<b>Al Reida</b>	54.2	18.8
<b>Sadah</b>	51.1	23.9
<b>Al Hami</b>	62.0	15.5
<b>Yarim</b>	70.3	24.4
<b>Zabid</b>	52.2	29.1
<b>National</b>	44.5	32.1

## 5. Billing and Customer

Performance on billing can be measured through the F.1 Collection efficiency and F.2 Amounts receivable as a debt period. The difference is that while F.1 can show quite high values – even higher than 100% in case old debts are being collected – the debt period gives a better picture of the historical performance of the utility in terms of collection of bills. A slowly increasing debt period over the years will be a burden on the balance sheets and at some point bad debts have to be written off.

The figures for 2005 are shown in Table 7. Quarterly figures for F.1 and F.2 as well as the underlying quarterly basic data (BIL29) can be found in Annex 2.

Table 7. Collection efficiency for 2005 and Debt period at the end of 2005.

	<b>F.1: Collection efficiency</b>	<b>F.2: Debt period</b>
	<b>%</b>	<b>days</b>
<b>Aden</b>	75.7	411.3
<b>Hajjah</b>	90.1	328.8
<b>Hudeidah</b>	103.3	237.7
<b>Ibb</b>	110.5	94.9
<b>Mukallah</b>	100.7	108.7
<b>Sanaa</b>	87.2	182.3
<b>Seiyun</b>	96.6	58.5
<b>Taiz</b>	109.3	251.0
<b>Amran</b>	73.4	148.0
<b>Bayt Al Faqih</b>	94.8	223.6
<b>Bajil</b>	100.9	164.3
<b>Ad Dis</b>	101.9	59.3
<b>Dhamar</b>	90.7	386.0
<b>Ghail</b>	89.0	126.9
<b>Al Mahweet</b>	88.0	254.0
<b>Mansouria</b>	98.9	186.0
<b>Al Mokha</b>	91.6	168.6
<b>Radaa</b>	97.7	125.2
<b>Al Reida</b>	93.7	113.1
<b>Sadah</b>	86.5	338.9
<b>Al Hami</b>	101.8	107.9
<b>Yarim</b>	79.0	156.1
<b>Zabid</b>	97.5	163.4
<b>National</b>	89.8	244.7

From Table 7 it can be concluded that at the national level the collection efficiency for 2005 is almost 90%. The debt period at the end of 2005 for the national weighted average is 245 days or approximately 8 months! Several years of collection efficiencies of 80-90% will ultimately result in a high debt period (unless bad debts are written off).

Good performers in terms of collection efficiency for 2005 are Hudeidah, Ibb, Mukallah (and branches), Taiz, Bajil, Zabid, Al Baydah (Radaa), Mansouria, Bajil and Seiyun.

Bad performers are Aden, Sana'a, Amran, AL Mahweet, Sadah and Yarim.

In terms of accumulated debts, utilities with a debt period of more than 8 months are Aden, Hajjah, Taiz, Dhamar, Al Mahweet, and Sadah. Utilities with less than 4 months debt period are Ibb, Mukallah (and branches), Seiyun, and Al Baydah (Radaa).

A measure for the pro-poor orientation of the tariffs is F.3 water expenses for first 5 m3 as a percentage of poor household income and F.4 sanitation expenses of first 5 m3 as a percentage of poor household income. The first 5 m3 is the tariff which is cross-subsidized by the higher consumer blocks. The average poor household income is set for all utilities at YR 20,000 per month. Although in reality this might be different for individual locations, it allows for a better comparison. A “golden rule” is that not more than 5% of monthly household income for the poor should be spend on water and sanitation. As can be seen for all utilities this criteria is easily reached and there is even scope for increasing the tariffs before touching the 5% limit.

The figures for 2005 are shown in Table 8. Quarterly figures for F.3 and F.4 as well as the underlying quarterly basic data (BIL32, BIL40 and M31) can be found in Annex 2.

For some reason, the PIIS cannot calculate the weighted average for the national level, but this issue will be resolved.

Table 8: Pro-poor tariffs for all utilities

	<b>F.3: Water expenses per poor household income using up to 5 m3.</b>	<b>F.4: Expenses for sewerage per poor household income using up to 5 m3.</b>
	<b>%</b>	<b>%</b>
<b>Aden</b>	0.6	0.4
<b>Hajjah</b>	1.8	1.0
<b>Hudeidah</b>	0.5	0.4
<b>Ibb</b>	0.5	0.4
<b>Mukallah</b>	0.5	0.2
<b>Sanaa</b>	1.0	1.3
<b>Seiyun</b>	0.5	0.1
<b>Taiz</b>	0.8	0.5
<b>Amran</b>	0.7	0.2
<b>Bayt Al Faqih</b>	0.9	
<b>Bajil</b>	0.9	
<b>Ad Dis</b>	0.5	
<b>Dhamar</b>	1.1	0.9
<b>Ghail</b>	0.5	
<b>Al Mahweet</b>	2.2	1.1
<b>Mansouria</b>	1.3	
<b>Al Mokha</b>	1.2	
<b>Radaa</b>	0.8	
<b>Al Reida</b>	0.5	
<b>Sadah</b>	1.9	
<b>Al Hami</b>	0.5	
<b>Yarim</b>	0.6	0.4
<b>Zabid</b>	0.9	

## **6. Water consumption**

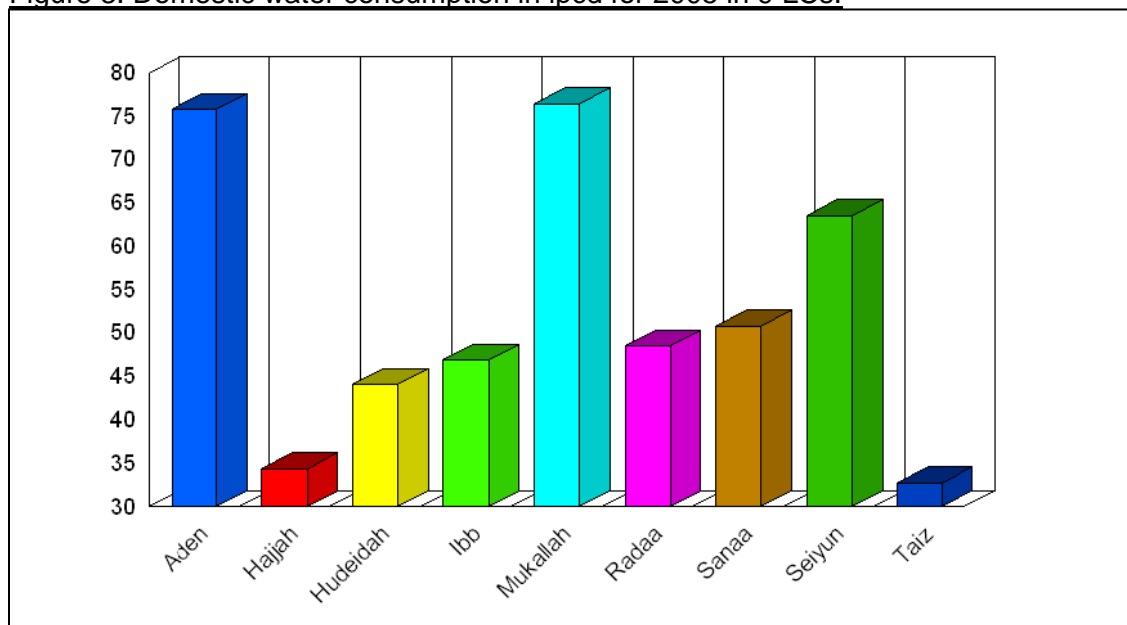
Water consumption is measured by G.1 Total average water consumption and G.2 Average domestic water consumption. The figures for 2005 are shown in Table 9. Quarterly figures for G.1 and G.2 as well as the underlying quarterly basic data (BIL30, BIL33 and M34) can be found in Annex 2. For some reason the weighted average for the national level cannot be calculated but this issue will be resolved.

Table 9. Total and domestic water consumption for 2005

	<b>G.1: Average total water consumption</b>	<b>G.2: Average domestic water consumption</b>
	<b>lpcd</b>	<b>lpcd</b>
<b>Aden</b>	102.0	75.8
<b>Hajjah</b>	50.3	34.4
<b>Hudeidah</b>	51.0	44.1
<b>Ibb</b>	49.0	46.9
<b>Mukallah</b>	86.4	76.4
<b>Sanaa</b>	53.8	50.8
<b>Seiyun</b>	64.7	63.4
<b>Taiz</b>	35.0	32.8
<b>Amran</b>	48.8	46.8
<b>Bayt Al Faqih</b>	40.7	39.2
<b>Bajil</b>	39.4	38.3
<b>Ad Dis</b>	76.5	79.1
<b>Dhamar</b>	58.7	51.4
<b>Ghail</b>	104.7	68.3
<b>Al Mahweet</b>	25.8	22.8
<b>Mansouria</b>	36.4	35.9
<b>Al Mokha</b>	68.7	61.1
<b>Radaa</b>	53.9	48.5
<b>Al Reida</b>	54.5	54.9
<b>Sadah</b>	52.9	47.5
<b>Al Hami</b>	65.3	66.6
<b>Yarim</b>	31.6	30.1
<b>Zabid</b>	41.1	39.0

From table 9 we can see that the domestic water consumption is varying from 60-80 lpcd in the hot climates (Aden, Mukallah and branches and some towns in Tihama), till 50-40 lpcd in the mountainous areas. Sana'a has an average of 50 lpcd. Low values are found in Mahweet, Taiz, Hajjah, Yarim, which can be attributed due a lack of water supply. Figure 3 shows the 2005 figures for domestic water consumption in the 9 LCs.

Figure 3. Domestic water consumption in lpcd for 2005 in 9 LCs.



## 7. Coverage

First of all coverage is measured through the number of total water (H.8) and sanitation (H.9) connections. Another measure is the population served by water (H.4) and sanitation (H.5), which is calculated as the product of the number of *domestic* connection and number of people per connection (M34). The real coverage in percentage is then derived by taking the population served as a percentage of the population in the service area (H.2 and H.3). Since we did not analyze the Population Census data of 2004 and we did not estimate the population in the service areas of the utilities this report limits itself to H.4, H.5 and H.8 and H.9. The number of people per connection is taken from what the utilities have provided, which ranges from 6 to 9 (see M34 in annex 5). A final indicator for coverage is the extent to which all water connections are also connected to sewerage by the combined services ratio (H.1).

The figures for 2005 are shown in Table 10. Quarterly figures for the indicators as well as the underlying quarterly basic data (BIL35, BIL36) can be found in Annex 2. For some reason the national value for H.4 and H.5 cannot be calculated automatically by the PIIS but this issue will be resolved.

Figure 10. Coverage indicators for 2005

	H.1 Combined services ratio %	H.4: Population served with water No	H.5: Population served with sewerage no	H.8: Number of water connections no	H.9: Number of sewerage connections no
Aden	86.0	492,942	425,406	92,087	79,240
Hajjah	56.7	32,48	17,836	4,903	2,781
Hudeidah	59.3	430,803	253,107	51,228	30,407
Ibb	78.1	135,261	108,216	15,781	12,708
Mukallah	61.1	188,776	122,31	30,551	18,662
Sanaa	79.3	672,939	538,794	78,018	62,564
Seiyun		185,136	2,048	28,001	305
Taiz	68.9	271,985	185,668	42,263	29,213
Amran	69.8	20,559	14,420	2,982	2,118
Bayt Al Faqih		41,286		6,042	
Bajil		45,913		6,785	
Ad Dis		21,672		3,421	
Dhamar	60.5	113,877	67,707	13,575	8,217
Ghail		53,431		8,949	
Al Mahweet	18.9	14,014	2,576	2,134	407
Mansouria		13,510		2,015	
Al Mokha		10,171		1,586	
Radaa	86.2	39,606	36,477	6,372	5,901
Al Reida		27,056		3,620	
Sadah		18,918		2,200	
Al Hami		62,930		10,635	
Yarim	43.9	25,207	20,713	3,646	3,009
Zabid		27,258		4,040	
National	59.9	2,945,737	1,795,279	420,834	255,227

From the table it can read that on the national level almost 60% of all water connections are also connected to sewerage. The total urban population in the 23 locations served is almost 3 million for water supply and 1.8 million for sanitation.

## Annex 1 Performance Indicators at Local and National Level

No.	Performance Indicator	Unit	Calculation	Local	National
A.1.1	Total number of staff per 1000 water connections	#	$(PAY1+PAY51) / (BIL2 / 1000)$	✓	✓
A.1.2	Total number of staff per 1000 water and sanitation connections	#	$(PAY1+PAY51) / ((BIL2 + BIL3) / 1000)$	✓	✓
A.2.1	Training plan implementation progress ratio	%	$(TR4 / TR41) * 100$	✓	X
A.2.2	Training expenses per total personnel costs	%	$(ACC5 / ACC25) * 100$	✓	✓
A.2.3	Total number of implemented training days per 100 number of staff	days	$(TR4 / PAY1) * 100$	✓	X
A.2.4	Number of staff that received training per total number of staff	%	$(TR42 / PAY1) * 100$	✓	X
B.1	Non-revenue water	%	$((BIL6-BIL7) / BIL6) * 100$	✓	✓
B.2.1	Number of average monthly reported overflows in sewerage network per 1000 sewerage connections	#	$OM8 / (BIL3 / 1000)$	✓	X
B.2.2	Number of repaired overflows per number of reported overflows in sewerage network	%	$(OM8 / OM9) * 100$	✓	X
B.3.1	Number of average monthly reported leakages in water supply network per 1000 water connections	#	$OM10 / (BIL2 / 1000)$	✓	X
B.3.2	Number of repaired leakages per number of reported leakages in water supply network	%	$(OM10 / OM11) * 100$	✓	X
B.4.1	Total hours of operating wells	Hr	OM52	✓	X
B.4.2	Total number of operating wells	no	OM72	✓	X
C.1	Bacteriological quality of water distributed: Number of residual chlorine samples according to standards per total number of samples taken	%	$(M13 / M12) * 100$	✓	✓

C.2	Effluent quality of wastewater treatment plants: Number of BOD-samples according to standards per total number of samples taken	%	$(M15/ M14) * 100$	✓	✓
C.2.1	Effluent quality of wastewater treatment plant 1	%	$(M53/ M54) * 100$	✓	<b>X</b>
C.2.2	Effluent quality of wastewater treatment plant 2	%	$(M55/ M56) * 100$	✓	<b>X</b>
C.2.3	Effluent quality of wastewater treatment plant 3	%	$(M57/ M58) * 100$	✓	<b>X</b>
D.1.1	Number of average monthly billing complaints per 1000 water connections	#	OM16 / (BIL2/1000)	✓	<b>X</b>
D.1.2	Number of average monthly non-billing complaints per 1000 water connections	#	OM17 / (BIL2/1000)	✓	<b>X</b>
D.2	Continuity of water supply services: A: 12-24 hr/d; B:6-12 hr/d; C: 1-6 hr/d; D: at least once a week; E: less than once a week	Cat. A to E	OM18	✓	✓
D.3	Total water produced	m <sup>3</sup>	BIL6	✓	✓
D.4	Total effluent produced	m <sup>3</sup>	BIL45	✓	✓
D.5	Effluent treatment ratio	%	$(BIL45/BIL6) * 100$	✓	✓
E.1.1	Total actual cost coverage	%	$(ACC19 / (ACC20 + ACC23)) * 100$	✓	✓
E.1.2	Total billed cost coverage	%	$(ACC21 / (ACC20 + ACC23)) * 100$	✓	✓
E.2.1	Operational actual cost coverage	%	$(ACC22 / ACC23) * 100$	✓	✓
E.2.2	Operational billed cost coverage	%	$(ACC24 / ACC23) * 100$	✓	✓
E.2.3	Actual cost coverage of O&M and electro-mechanical equipment	%	$(ACC19 / (ACC23+ACC78) ) * 100$	✓	✓
E.2.4	Billed cost coverage of O&M and electro-mechanical equipment	%	$(ACC21/(ACC23+ ACC78) ) * 100$	✓	✓
E.3	Personnel cost per total operational cost	%	$(ACC25 / ACC23) * 100$	✓	✓

E.4	Energy cost per total operational cost	%	$(ACC26 / ACC23) * 100$	✓	✓
E.5	Investment disbursement progress ratio	%	$(ACC27 / ACC28) * 100$	✓	✓
E.6.1	Energy costs per m3 water produced	YR	ACC43 / BIL6	✓	<b>X</b>
E.6.2	Energy costs per m3 water treated	YR	ACC44 / BIL45	✓	<b>X</b>
E.7.1	Amount on current account (revenue + expenditure)	YR	ACC47+ACC48	✓	✓
E.7.2	Amount on connection account	YR	ACC49	✓	✓
E.7.3	Amount on depreciation account	YR	ACC50	✓	✓
F.1	Collection efficiency	%	$(ACC22 / ACC24) * 100$	✓	✓
F.1.1	Collection efficiency domestic	%	$(BIL64/BIL61) * 100$	✓	<b>X</b>
F.1.2	Collection efficiency government	%	$(BIL65/BIL62) * 100$	✓	<b>X</b>
F.1.3	Collection efficiency commercial	%	$(BIL66/BIL63) * 100$	✓	<b>X</b>
F.2	Amounts receivable expressed as debt period	days	$BIL29 / (ACC24 / NOPD)$	✓	✓
F.2.1	Debt period for domestic	days	$BIL67/(BIL61/NOPD)$	✓	<b>X</b>
F.2.2	Debt period for government	days	$BIL68/(BIL62/NOPD)$	✓	<b>X</b>
F.2.3	Debt period for commercial	days	$BIL69/(BIL63/NOPD)$	✓	<b>X</b>
F.3	Water expenses for first 5 m3 per household income for the poor	%	$(BIL32 / M31) * 100$	✓	✓
F.4	Sewerage expenses for first 5 m3 per household income for the poor	%	$(BIL40 / M31) * 100$	✓	✓
F.5	Average applied tariff per m3 for total water billed	YR/m <sup>3</sup>	ACC24/BIL7	✓	✓
F.5.1	Average applied tariff per m3 for water billed domestic	YR/m <sup>3</sup>	BIL61/BIL33	✓	<b>X</b>
F.5.2	Average applied tariff per m3 for water billed government	YR/m <sup>3</sup>	BIL62/BIL59	✓	<b>X</b>
F.5.3	Average applied tariff per m3 for water billed commercial	yr/m3	BIL63/BIL60	✓	<b>X</b>

G.1	Average total water consumption	lpcd	$(BIL7 / (BIL2 * M34 * NOPD)) * 1000$	✓	✓
G.2	Average domestic water consumption	lpcd	$(BIL33 / (BIL30 * M34 * NOPD)) * 1000$	✓	✓
H.1	Combined services (water and sanitation) ratio	%	$(BIL35 / BIL2) * 100$	✓	<b>X</b>
H.2	Water supply services coverage	%	$((BIL30 * M34) / M37) * 100$	✓	✓
H.3	Sewerage services coverage	%	$((BIL36 * M34) / M37) * 100$	✓	✓
H.4	Population served with water supply services	#	$BIL30 * M34$	✓	✓
H.5	Population served with sewerage services	#	$BIL36 * M34$	✓	✓
H.6	Length of water supply network	Km	FIX38	✓	✓
H.7	Length of sewerage network	Km	FIX39	✓	✓
H.8	Number of total water connections	#	BIL2	✓	✓
H.9	Number of total sewerage connections	#	BIL3	✓	✓
I.1	Implementation progress ratio for approved investments (local and foreign)	%	$(INV83/ACC28) * 100$	✓	✓
I.2	Implementation progress ratio for approved investments local-financed	%	$(INV80/INV79) * 100$	✓	✓
I.3	Implementation progress ratio for approved investments foreign-financed	%	$(INV82/INV81) * 100$	✓	✓
I.4.1	Implementation progress ratio for approved investments for project A	%	$(INV85/INV84) * 100$	✓	<b>X</b>
I.4.2	Implementation progress ratio for approved investments for project B	%	$(INV87/INV86) * 100$	✓	<b>X</b>
I.4.3	Implementation progress ratio for approved investments for project C	%	$(INV89/INV88) * 100$	✓	<b>X</b>

## Basic data to calculate Performance Indicators

<b>Code</b>	<b>Basic Data</b>	<b>Unit</b>	<b>Frequency</b>	<b>Manual</b>	<b>Systems</b>	<b>Local specific</b>
ACC19	Total collected revenues (operational and capital)	YR	Monthly		<b>X</b>	<b>N</b>
ACC20	Total capital cost	YR	Monthly	<b>X</b>		<b>N</b>
ACC21	Total billed revenues (operational and capital)	YR	Monthly		<b>X</b>	<b>N</b>
ACC22	Total collected operational revenues	YR	Monthly		<b>X</b>	<b>N</b>
ACC23	Total operational costs	YR	Monthly		<b>X</b>	<b>N</b>
ACC24	Total billed operational revenues	YR	Monthly		<b>X</b>	<b>N</b>
ACC25	Total personnel costs	YR	Monthly		<b>X</b>	<b>N</b>
ACC26	Total energy costs	YR	Monthly		<b>X</b>	<b>N</b>
ACC27	Disbursed investments	YR	Monthly	<b>X</b>		<b>N</b>
ACC28	Allocated annual investment budget	YR	Yearly	<b>X</b>		<b>N</b>
ACC43	Energy cost for production of water	YR	Monthly		<b>X</b>	<b>Y</b>
ACC44	Energy cost for treatment of sewerage	YR	Monthly		<b>X</b>	<b>Y</b>
ACC47	Amount on expenditure account	YR	Monthly		<b>X</b>	<b>N</b>
ACC48	Amount on revenues account	YR	Monthly		<b>X</b>	<b>N</b>

ACC49	Amount on connection account	YR	Monthly		<b>X</b>	<b>N</b>
ACC5	Training expenses	YR	Monthly		<b>X</b>	<b>N</b>
ACC50	Amount on depreciation account	YR	Monthly		<b>X</b>	<b>N</b>
ACC73	Total billed operational revenues for water services	YR	Monthly		<b>X</b>	<b>N</b>
ACC74	Total billed operational revenues for sanitation services	YR	Monthly		<b>X</b>	<b>N</b>
ACC75	Total material costs	YR	Monthly		<b>X</b>	<b>N</b>
ACC76	Total services costs	YR	Monthly		<b>X</b>	<b>N</b>
ACC77	Total other costs	YR	Monthly		<b>X</b>	<b>N</b>
ACC78	Capital costs for electro-mechanical equipment ONLY	YR	Monthly	<b>X</b>		<b>N</b>
BIL2	Number of water connections	#	Monthly		<b>X</b>	<b>N</b>
BIL29	Total amount receivable	YR	Monthly		<b>X</b>	<b>N</b>
BIL3	Number of sewerage connections	#	Monthly		<b>X</b>	<b>N</b>
BIL30	Number of domestic water connections	#	Monthly		<b>X</b>	<b>N</b>
BIL32	Average monthly water expenses for first 5 m3 of water	YR	Monthly		<b>X</b>	<b>N</b>
BIL33	Water billed on domestic water connections	M3	Monthly		<b>X</b>	<b>N</b>
BIL35	Number of connections with both water and sewerage	#	Monthly		<b>X</b>	<b>N</b>

BIL36	Number of domestic sewerage connections	#	Monthly		<b>X</b>	<b>N</b>
BIL40	Average monthly sewerage expenses for first 5m3 of water	YR	Monthly		<b>X</b>	<b>N</b>
BIL45	Effluent produced	M3	Monthly	<b>X</b>		<b>N</b>
BIL46	Number of water connections with "zero reading"	#	Monthly		<b>X</b>	<b>Y</b>
BIL59	Total water billed on government connections	M3	Monthly		<b>X</b>	<b>Y</b>
BIL6	Water produced	M3	Monthly	<b>X</b>		<b>N</b>
BIL59	Total water billed on government connections	M3	Monthly		<b>X</b>	<b>Y</b>
BIL60	Total water billed on commercial connections	M3	Monthly		<b>X</b>	<b>Y</b>
BIL61	Total billed operational revenues on domestic connections	YR	Monthly		<b>X</b>	<b>Y</b>
BIL62	Total billed operational revenues on government connections	YR	Monthly		<b>X</b>	<b>Y</b>
BIL63	Total billed operational revenues on commercial connections	YR	Monthly		<b>X</b>	<b>Y</b>
BIL64	Total collected operational revenues on domestic connections	YR	Monthly		<b>X</b>	<b>Y</b>
BIL65	Total collected operational revenues on government connections	YR	Monthly		<b>X</b>	<b>Y</b>
BIL66	Total collected operational revenues on commercial connections	YR	Monthly		<b>X</b>	<b>Y</b>
BIL67	Amounts receivable domestic	YR	Monthly		<b>X</b>	<b>Y</b>
BIL68	Amounts receivable government	YR	Monthly		<b>X</b>	<b>Y</b>
BIL69	Amounts receivable commercial	YR	Monthly		<b>X</b>	<b>Y</b>
BIL70	Number of government water connections	#	Monthly		<b>X</b>	<b>Y</b>
BIL7	Water billed	M3	Monthly		<b>X</b>	<b>N</b>
BIL71	Number of commercial water connections	#	Monthly		<b>X</b>	<b>Y</b>
FIX38	Length of water supply network	km	Yearly	<b>X</b>		<b>N</b>
FIX39	Length of sewerage network	km	Yearly	<b>X</b>		<b>N</b>
INV79	Allocated yearly investment budget - locally financed	YR	Yearly	<b>X</b>		<b>N</b>

INV80	Approved investments - locally financed	YR	Monthly	<b>X</b>		<b>N</b>
INV81	Allocated yearly investment budget - foreign financed	YR	yearly	<b>X</b>		<b>N</b>
INV82	Approved investments - foreign financed	YR	monthly	<b>X</b>		<b>N</b>
INV83	Approved investments (local and foreign)	YR	Monthly	<b>X</b>		<b>N</b>
INV84	Allocated yearly investment budget for project A	YR	Yearly	<b>X</b>		<b>Y</b>
INV85	Approved investments for project A (local and foreign)	YR	Monthly	<b>X</b>		<b>Y</b>
INV86	Allocated yearly investment budget for project B (local and foreign)	YR	yearly	<b>X</b>		<b>Y</b>
INV87	Approved investments for project B (local and foreign)	YR	Monthly	<b>X</b>		<b>Y</b>
INV88	Allocated yearly investment budget for project C (local and foreign)	YR	Yearly	<b>X</b>		<b>Y</b>
INV89	Approved investments for project C (local and foreign)	YR	Monthly	<b>X</b>		<b>Y</b>
M12	Number of residual chorine sample taken	#	Monthly	<b>X</b>		<b>N</b>
M13	Number of residual chlorine sample according to standards	#	Monthly	<b>X</b>		<b>N</b>
M14	Number of BOD samples taken	#	Monthly	<b>X</b>		<b>N</b>
M15	Number of BOD-samples according to standard	#	Monthly	<b>X</b>		<b>N</b>
M31	Monthly income for poor household	YR	Yearly	<b>X</b>		<b>N</b>
M34	Number of people per water connection	#	Yearly	<b>X</b>		<b>N</b>
M37	Total population in service area	#	Yearly	<b>X</b>		<b>N</b>
M53	Number of BOD samples according to standard STP1	#	Monthly	<b>X</b>		<b>Y</b>
M54	Number of BOD samples taken from STP1	#	Monthly	<b>X</b>		<b>Y</b>

M55	Number of BOD samples according to standard STP2	#	Monthly	<b>X</b>		<b>Y</b>
M56	Number of BOD samples taken from STP2	#	Monthly	<b>X</b>		<b>Y</b>
M57	Number of BOD samples according to standard STP3	#	Monthly	<b>X</b>		<b>Y</b>
M58	Number of BOD samples taken from STP3	#	Monthly	<b>X</b>		<b>Y</b>
OM10	Number of leakages in water supply network reported	#	Monthly	<b>X</b>		<b>Y</b>
OM11	Number of repaired leakages in water supply network	#	Monthly	<b>X</b>		<b>Y</b>
OM16	Number of billing complaints	#	Monthly	<b>X</b>		<b>Y</b>
OM17	Number of complaints not related to billing	#	Monthly	<b>X</b>		<b>Y</b>
OM18	Continuity of water supply: A: 12-24 hr/d; B: 12-6 hr/d; C: 1-6 hr/d; D: at least once a week; E: less than once a week	Cat.	Monthly	<b>X</b>		<b>N</b>
OM52	Total hours of operating wells	#	Monthly	<b>X</b>		<b>Y</b>
OM8	Number of reported sewerage overflows	#	Monthly	<b>X</b>		<b>Y</b>
OM9	Number of repaired sewerage overflows	#	Monthly	<b>X</b>		<b>Y</b>
OM72	Number of operating wells	no	monthly	<b>X</b>		<b>Y</b>
PAY1	Total number of permanent and contracted staff	#	Monthly		<b>X</b>	<b>N</b>
PAY51	Total number of daily workers staff	#	Monthly		<b>X</b>	<b>N</b>
TR4	Number of training days implemented	days	Monthly	<b>X</b>		<b>Y</b>
TR41	Annual number of training days planned	days	Yearly	<b>X</b>		<b>Y</b>
TR42	Number of staff that received training	#	Monthly	<b>X</b>		<b>Y</b>

**ANNEX 2 → see separate PDF-files attached to the document**