Annex 3.5 Results of Field Survey in January 2003

1. **Measurement of River Discharge**
2. **Measurement of Spring Flow**
3. **Water Quality Analysis (1)**
4. **Water Quality Analysis (2)**
5. **Cross Section Survey**
6. **Well Inventory Survey**

   (Attached 664 well data. Remains are referred to CD-ROM)

Annex 3.5 Rivers Gauging Data Sheet

Month: JANUARY 2003

Code	Name of the River	Instrument	Observation Point (in Degrees)		Altitude	Discharge	Temperature	Electro-conductivity
			x	y	(m)	(m^3/s)	(°C)	(µS/cm)
601	NAHR EL KABIR	UC-204	34°39'20"	36°18'32"	250	10.69	11.40	492
602	NAHR OSTOUENE	UC-204	34°33'50"	36°05'36"	78	4.03	12.60	512
603	NAHR EL BARED	UC-304	34°30'01"	35°57'51"	20	9.76	8.50	501
604	NAHR ABOU ALI	UC-204	34°18'33"	35°51'43"	265	2.81	9.00	734
605	NAHR EL JAOUZ	UC-204	34°16'03"	35°39'41"	4	2.70	12.60	419
606	NAHR IBRAHIM	UC-204	34°03'41"	35°39'07"	16	29.19	11.80	406
607	NAHR EL KELB	UC-204	33°57'03"	35°36'22"	17	10.46	13.20	419
608	NAHR BEIRUT	UC-204	33°52'51"	35°31'54"	7	4.15	14.10	479
609	NAHR EL DAMOUR	UC-204	33°42'17"	35°26'54"	3	5.51	13.90	464
610	NAHR EL AWALI	UC-204	33°35'19"	35°32'36"	12	49.38	12.10	462
611	NAHR SAINIQ	UC-204	33°32'07"	35°21'58"	6	4.28	13.90	497
612	NAHR EL ZAHRANI	UC-204	33°29'29"	35°20'39"	6	10.26	14.00	371
613	LOWER LITANI	UC-204	33°19'48"	35°15'31"	2	39.67	14.20	446
614	UPPER LITANI	U-204	33°51'49"	35°59'19"	931	4.62	10.80	669
615	NAHR EL AASSI	UC-204	34°23'30"	36°24'55"	598	6.34	13.40	343
	TOTAL MEASURED	**15**						

613: OVERFLOW FROM QARAOUN LAKE

Springs Gauging Data Sheet

Month: JANUARY 2003

Code	Name of the Spring	Village	Instrument	Observation Point (In Degree)		Altitude	Discharge	Temperature	Electro-conductivity	Remarks
				x	y	(m)	(l/s)	(°C)	(µS/cm)	
101	NABAA FNAIDEQ	FNAIDEQ	UC-304	34°28'48"	36°12'21"	1325	911.78	8.00	413.00	
103	NABAA EL BANAT	FNAIDEQ	UC-304	34°28'38"	36°11'48"	1201	125.24	10.60	489.00	
104	AIN EL DEEK	AKKAR EL ATTICA	UC-304	34°30'15"	36°13'59"	1272	19.96	8.90	402.00	
1051	NABAA EL CHOUH EL ALI	AKKAR EL ATTICA	UC-304	34°30'12"	36°13'57"	1336	454.79	8.90	404.00	
1052	NABAA EL CHOUH EL WAT	AKKAR EL ATTICA	UC-304	34°30'15"	36°13'58"	1271	364.73	9.00	401.00	
106	NABAA EL JAOUZ	AKKAR EL ATTICA	UC-304	34°30'25"	36°14'08"	1183	502.71	9.10	390.00	
107	NABAA ECH CHEIKH JNAI	AKKAR EL ATTICA	UC-304	34°30'56"	36°14'51"	998	82.75	10.40	405.00	
108	NABAA OMAR KAYLO	AKKAR EL ATTICA	BUCKET	34°30'52"	36°14'59"	1109	53.48	9.90	413.00	
109	AIN EL WATIEH	AKKAR EL ATTICA	BUCKET	34°32'21"	36°14'38"	864	18.81	13.60	623.00	
110	AIN EL HOMSIYE	AKKAR EL ATTICA	UC-304	34°31'47"	36°14'28"	748	20.16	13.40	601.00	
111	AIN AAYAT	AAYAT	UC-304	34°32'16"	36°11'59"	660	19.27	15.20	759.00	
112	NABAA ES SAFA	BOQAIAA	C-204/UC-3	34°37'18"	36°23'35"	383	1914.31	15.10	52.30	
113	TAL ET TINE	BOQAIAA	UC-204	34°39'12"	36°19'59"	281	300.03	17.40	560.00	
115	AIN EL ABIAD	QOBAIYAT	UC-304	34°32'50"	36°15'50"	672	31.57	14.90	654.00	
116	NABAA HMADE	QOBAIYAT	UC-304	34°32'02"	36°16'25"	915	48.32	12.40	536.00	
117	NABAA EL SHARQI	ANDQET	UC-304	34°32'32"	36°18'37"	790	8.34	13.40	543.00	
118	NABAA EL CHARQI	ANDQET	UC-304	34°32'46"	36°18'15"	721	69.16	14.50	493.00	
119	NABAA ECH CHEIKH	LAQLOUQ	UC-304	34°10'14"	35°52'33"	1571	65.97	9.20	288.00	
120	AIN ES SAOUDA	TANNOURINE-HARISSA	UC-304	34°11'25"	35°56'09"	1733	10.87	7.80	340.00	
122	NABAA EL MOGHRAQ	TANNOURINE-BALAA	UC-304	34°10'18"	35°52'44"	1608	206.17	8.20	333.00	
123	NABAA EL KORSI	WATA HOUB	UC-304	34°11'32"	35°54'44"	1519	70.76	9.50	295.00	
126	NABAA EL FOUAR	LAQLOUQ	BUCKET	34°09'10"	35°53'34"	1955	1.89	6.60	359.00	
127	EL HOUALIF	TANNOURINE-WADI EL JORD	UC-304	34°10'09"	35°54'57"	1691	18.89	7.40	346.00	
128	NABAA EL ANBOUB	TANNOURINE-WADI EL JORD	UC-304	34°10'07"	35°55'08"	1750	23.07	7.60	246.00	
129	AIN EL BAIDA	TANNOURINE-HARISSA	BUCKET	34°12'17"	35°58'15"	1952	2.65	7.90	375.00	
130	NABAA EL AHMAR	TANNOURINE-HARISSA	BUCKET	34°11'59"	35°57'22"	1767	7.62	8.60	358.00	
131	NABAA EL ASFAR	TANNOURINE-HARISSA	50/100	34°11'57"	35°57'19"	1746	6.21	7.80	398.00	
132	NABAA HAZRITA	TANNOURINE -WADI EL JORD	BUCKET	34°10'18"	35°53'38"	1607	3.49	9.50	327.00	
133	NABAA EL MOKHADA	TANNOURINE	UC-304	34°10'39"	35°54'18"	1460	9.96	9.40	409.00	
134	NABAA EL JDID	TANNOURINE-HARISSA	BUCKET	34°11'55"	35°57'32"	1841	2.78	8.30	391.00	
135	NABAA DALLI	KFARHILDA	UC-304	34°13'11"	35°50'41"	623	1006.67	11.40	346.00	
136	NABAA RACHAAINE	RACHAAINE	UC-304	34°23'15"	35°55'50"	157	2711.00	13.10	375.00	
137	AIN EL KHALDIEH	KHALDIEH	UC-304	34°22'14"	35°54'20"	147	5.29	17.90	617.00	

138	AYOUN ACHACH	ACHACH	UC-304	34°25'20"	35°56'29"	220	27.08	18.80	557.00	
139	NABAA MAR SARKIS	EHDEN	UC-304	34°17'21"	35°58'58"	1510	57.62	7.70	201.00	Flows of 2 pipes 200mm and 150mm taking water
140	NABAA KADISHA	BCHARRE	UC-304	34°14'38"	36°02'12"	1708	594.69	7.10	259.00	
141	NABAA NBAT	BCHARRE	BUCKET	34°15'41"	36°01'24"	1768	32.97	8.70	283.00	
142	NABAA MAR SEMAAN	BCHARRE	UC-304	34°15'43"	36°00'34"	1753	134.44	7.10	215.00	
143	AIN EL HADDAD	BCHARRE	UC-304	34°15'41"	35°59'42"	1545	29.71	8.70	284.00	
145	NABAA EL JOUANI	BEQAAKAFRA	UC-304	34°13'30"	36°02'03"	1931	27.14	9.70	365.00	
146	AIN MABKHA	BAZOUN	UC-304	34°13'37"	35°59'42"	1732	41.60	7.80	346.00	
147	NABAA EL AARBIT	BEQAAKAFRA	BUCKET	34°13'27"	36°00'17"	1770	48.65	5.30	235.00	
148	AIN EL FOUAR	ES SOUAISSI	UC-304	34°33'16"	36°06'57"	148	23.99	19.50	533.00	
149	NABAA EL HADDAD	SAADINE	UC-304	34°35'30"	36°05'17"	51	18.75	20.50	675.00	
152	NABAA EL QOLQAS	KOUAIKHAT	UC-304	34°34'23"	36°05'43"	84	13.79	20.50	575.00	
164	AIN EL AFSA	TANNOURINE-HARISSA	BUCKET	34°12'01"	35°56'48"	1663	9.71	10.40	379.00	
165	ARID EL MSALLEM	TANNOURINE-HARISSA	UC-304	34°12'10"	35°57'33"	1787	8.53	6.80	373.00	
166	NABAA EL KORSI	TANNOURINE-WADI EL JORD	BUCKET	34°10'16"	35°54'46"	1686	8.33	9.50	366.00	
168	NABAA EL CHELLAL	LAQLOUQ	BUCKET	34°09'14"	35°54'07"	1972	3.57	8.10	486.00	
169	NABAA CHAIAA	TANNOURINE -WADI EL JORD	UC-304	34°10'07"	35°55'17"	1748	13.27	8.40	291.00	
170	NABAA EL TINE	AKKAR EL ATTICA	UC-304	34°31'39"	36°14'03"	655	13.65	13.60	539.00	
171	AIN EL TAQIYEH	AKKAR EL ATTICA	UC-304	34°31'21"	36°14'12"	663	159.51	12.80	458.00	
172	AIN EL SET	QOBAIYAT	UC-304	34°33'24"	36°16'47"	614	84.36	14.80	611.00	
173	AIN EL TINE	ANDQET	BUCKET	34°32'42"	36°18'32"	731	4.08	14.10	572.00	
174	NABAA EL HARFOUCH	BCHARRE	BUCKET	34°15'43"	36°01'17"	1773	12.32	7.50	201.00	
176	NABAA EL HAMAM	CHIR EL HMAIRIEH	UC-304	34°37'55"	36°05'49"	22	158.44	21.40	679.00	
177	NABAA GHZAILI	GHZAILI	UC-304	34°35'36"	36°06'20"	97	30.89	20.20	518.00	
178	NABAA ABOU SHAWKAT	KOUAIKHAT	BUCKET	34°34'20"	36°05'51"	84	6.13	21.30	498.00	
179	NABAA SIR	SIR EL DANNIYE	UC-304	34°23'00"	36°01'42"	908	1169.15	9.80	315.00	Flow of a large number of pipes taking water from the
180	NABAA QSSEM	BEQAARHABOUNE	UC-304	34°22'21"	36°02'06"	1094	281.76	9.40	303.00	Flow of a large number of pipes taking water from the
181	NABAA SUCCAR	BEQAARHABOUNE	UC-304	34°22'02"	36°04'58"	1676	112.23	5.50	195.00	
182	NABAA CHQEIQ	KFARBIBNIT	UC-304	34°24'09"	36°04'30"	1134	27.50	11.40	431.00	
183	AIN EL BORJ	MINIEH	UC-304	34°29'51"	35°56'20"	10	69.21	19.90	1141.00	
184	AIN EL CHARCHARA	MINIEH	UC-304	34°29'46"	35°56'12"	4	15.84	19.50	1006.00	
185	AIN MARKABTA	MARKABTA	UC-304	34°27'01"	35°57'58"	275	33.15	19.00	434.00	
186	AIN MARMAR	OYOUN ES SAMAK	UC-304	34°26'29"	36°01'27"	243	14.77	16.70	529.00	
187	AIN ES SAYED	OYOUN ES SAMAK	UC-304	34°26'21"	36°00'10"	216	179.35	15.30	546.00	
188	AIN EL SAKHRA	MINIEH	UC-304	34°29'40"	35°56'01"	0	8.39	19.10	893.00	
189	AIN EZ ZARQA	MINIEH	UC-304	34°29'40"	35°56'09"	27	102.03	19.70	908.00	

201	NABAA EL BAROUK	BAROUK	UC-304	33°42'42"	35°41'35"	1089	1339.09	10.30	268.00	
202	NABAA ES SAFA	SAFA	UC-304	33°45'07"	35°42'01"	914	1539.25	10.80	355.00	
207	NABAA EL AKHOUAT	WADI BNEHLAY	UC-304	33°41'14"	35°32'18"	443	232.70	15.40	496.00	
208	AIN EL BARDEH	WADI BNEHLAY	UC-304	33°40'55"	35°31'43"	389	31.10	16.00	557.00	
211	NABAA BATER	BATER ECH CHOUF	UC-304	33°35'58"	35°37'04"	971	278.34	13.10	444.00	
212	NABAA EL AASAL	FARAYA	UC-204	34°00'35"	35°50'18"	1551	2080.78	7.10	248.00	
213	NABAA EL LABAN	KFARDEBIAN	UC-204	33°59'42"	35°49'42"	1646	4370.24	6.30	223.00	
214	AIN ED DELBE	FARAYA	UC-304	34°00'38"	35°49'27"	1279	54.83	8.90	319.00	
215	NABAA EL MGHARA	HRAJEL	UC-204	34°00'43"	35°48'02"	1542	330.69	10.60	431.00	
216	NABAA EL QANA	HRAJEL	UC-304	34°02'32"	35°48'31"	1580	205.41	8.10	299.00	
2171	NABAA ECH CHHARIR	MAIROUBA	UC-304	34°01'03"	35°46'05"	1292	13.56	8.40	176.10	
2172	NABAA ES SOUANE	MAIROUBA	CKET/UC-	35°00'54"	35°46'11"	1308	13.69	11.10	459.00	
2181	NABAA EL SANNOUR	MAIROUBA	UC-304	34°01'29"	35°46'54"	1332	293.56	8.20	297.00	
2182	NABAA EL TANNOUR	MAIROUBA	UC-304	35°01'12"	35°46'26"	1319	25.28	11.50	481.00	
219	NABAA SANNINE	BASKINTA	UC-304	33°56'12"	35°50'31"	1674	252.29	6.50	220.00	
220	NABAA JAOUZ EL NEMEL	BASKINTA	UC-304	33°55'49"	35°50'18"	1655	103.68	7.90	271.00	
223	NABAA KHALAF	QARTABA	BUCKET	34°05'47"	35°51'02"	1189	5.88	13.40	405.00	
224	RAS EN NABAA	QARTABA	BUCKET	34°06'33"	35°51'23"	1329	5.00	8.60	374.00	
225	NABAA ECH CHARBINE	ECH CHARBINE	UC-304	34°07'03"	35°51'32"	1578	15.95	9.80	434.00	
226	NABAA EZ ZGHIR	ECH CHARBINE	BUCKET	34°07'04"	35°51'31"	1599	17.89	9.90	408.00	
227	NABAA EL KBIR	ECH CHARBINE	UC-304	34°07'14"	35°51'58"	1585	20.91	9.10	390.00	
228	NABAA EL FOUAR	ECH CHARBINE	UC-304	34°07'16"	35°51'33"	1621	47.15	8.40	339.00	
229	NABAA EZ ZEIN	MGHAIRI	BUCKET	34°06'18"	35°52'25"	1237	4.78	12.20	383.00	
230	NABAA BOU SALHAB	MGHAIRI	UC-304	34°06'18"	35°52'44"	1195	69.24	12.50	406.00	
231	NABAA EL TOUTE	YANOUH	BUCKET	34°05'57"	35°52'47"	1106	3.70	12.10	528.00	
232	NABAA EL ROUAISS	AAKOURA	C-204/UC-3	34°06'35"	35°54'26"	1300	1940.34	8.80	260.00	
233	AIN EL BARBRISSE	AAKOURA	UC-304	34°09'05"	35°52'58"	1904	18.61	7.60	337.00	
234	AIN EL BAHRA	AAKOURA	UC-304	34°08'31"	35°53'04"	1861	16.16	7.30	382.00	
235	AIN EL QASSIS	AAKOURA	UC-304	34°08'44"	35°52'37"	1818	13.53	8.30	404.00	
236	AIN EL JAOUZ	AAKOURA	UC-304	34°08'18"	35°55'43"	1658	56.88	8.60	223.00	
237	AIN RICHMI	AAKOURA	UC-304	34°07'28"	35°55'06"	1608	423.39	8.70	247.00	
238	AIN SNITA	AAKOURA	UC-304	34°07'01"	35°54'22"	1307	47.49	11.10	507.00	
239	AIN ELIAS	AAKOURA	UC-304	34°07'32"	35°52'53"	1500	80.06	9.70	311.00	
240	AIN EL BLATA	AAKOURA	UC-304	34°07'57"	35°52'43"	1666	24.95	10.30	345.00	
241	AIN EL DAIAA	AAKOURA	UC-304	34°07'14"	35°54'16"	1382	16.74	10.10	367.00	
245	AIN EL SAFRA	AFKA	UC-304	34°04'13"	35°53'13"	1145	20.89	10.50	34.70	

246	AIN EL HISSAN	AFKA	UC-304	34°04'08"	35°53'06"	1182	33.68	10.50	315.00	
247	NABAA EL MADIQ	YAHCHOUCH	UC-304	34°05'03"	35°42'07"	170	2023.78	13.20	387.00	
248	NABAA EL DAYSHOUNIEH	DAYSHOUNIEH	UC-204	33°50'25"	35°35'19"	110	4995.71	14.60	517.00	
250	TANNOUR EL WADI	ANTELIAS	UC-304	33°54'43"	35°35'52"	32	341.76	14.80	439.00	
251	FOUAR ANTELIAS	ANTELIAS	C-304/UC-2	33°54'42"	35°35'55"	30	2313.33	15.10	435.00	
256	NABAA EL QAA	SAFA	UC-304	33°44'57"	35°42'05"	981	931.07	11.90	282.00	
257	NABAA ET TANNOUR	SAFA	UC-304	33°44'57"	35°42'08"	997	251.24	11.90	281.00	
258	AIN EL DALAA	AIN ZHALTA	CKET/UC-	33°44'35"	35°42'08"	1082	8.80	13.10	509.00	
259	NABAA EL MOUBARAK	DEIR DOURIT	UC-304	33°41'14"	35°32'22"	465	17.09	15.50	513.00	
260	AIN ES SAOUDA	AAKOURA	BUCKET	34°08'19"	35°53'15"	1820	2.60	8.70	404.00	
261	DOUAR EL MARJEH	AAKOURA	UC-304	34°07'57"	35°59'14"	1703	48.98	7.60	369.00	
262	NABAA EL HOUAIRI	QARTABA	BUCKET	34°06'22"	35°51'12"	1301	10.55	8.80	358.00	
263	NABAA EL WAHLI	QARTABA	UC-304	34°06'28"	35°51'17"	1314	1.53	10.30	316.00	
305	QAA ER RIM	ZAHLE	UC-304	33°53'10"	35°52'19"	1227	137.15	7.70	285.00	Flow of pipe 50mm taking water from the spring is not
308	NABAA CHTOURA	CHTOURA	UC-304	33°49'25"	35°51'03"	929	360.43	13.10	408.00	
309	NABAA ECH CHAGHOUR	OUADI NAHLE	UC-304	34°02'44"	36°17'26"	1380	8.62	14.30	227.00	Flow of pipe 75mm taking water from the spring is not
310	NABAA EL FOUARA	OUADI NAHLE	UC-304	34°04'26"	36°19'11"	1550	4.61	11.60	307.00	
311	NABAA HAQL EL TEFFAH/	OUADI NAHLE	UC-304	34°04'09"	36°18'32"	1487	10.48	11.10	356.00	
312	NABAA EM MELHEM	OUADI NAHLE	UC-304	34°03'24"	36°17'49"	1472	5.11	12.00	360.00	
314	NABAA ER ROUAISS	LABOUE	UC-304	34°11'48"	36°21'09"	906	290.81	14.40	328.00	
315	NABAA EL QAA	LABOUE	WEIR	34°11'52"	36°21'09"	908	466.75	14.40	329.00	Flows of 2 pipes 200mm and 150mm taking water
316	NABAA MATRAFE	LABOUE	UC-304	34°11'51"	36°21'07"	903	166.99	14.40	328.00	
317	NABAA SOUAIKA	LABOUE	UC-304	34°11'48"	36°21'10"	903	23.56	14.40	328.00	
318	NABAA RAS BAALBECK	RAS BAALBECK	UC-304	34°15'38"	36°25'02"	989	29.14	17.40	455.00	
319	NABAA EL FAKEHA	FAKEHA	UC-304	34°14'31"	36°24'25"	981	108.75	17.80	371.00	
320	RAS EL AIN	BAALBECK	UC-304	33°59'58"	36°12'59"	1170	139.01	12.20	31.80	Flows of 2 pipes 200mm and 150mm taking water
321	NABAA EL YAMMOUNEH	YAMMOUNEH	UC-204	34°07'18"	36°02'00"	1360	873.31	8.00	253.00	springs are collected into 1 c
323	RAS EL MAL	HERMEL	UC-304	34°23'25"	36°22'17"	786	229.20	11.20	259.00	
324	NABAA EL RAYSEH	HERMEL	UC-304	34°23'31"	36°22'28"	759	29.62	11.30	236.00	
325	NABAA EZ ZHOUR	SAADNAYEL	UC-304	33°49'18"	35°52'30"	910	78.67	15.10	564.00	
327	EHDAASHARIEH	HERMEL	UC-304	34°23'29"	36°22'39"	777	69.38	11.00	280.00	
328	NABAA EL TAQA	ZAHLE	UC-304	33°52'42"	35°51'49"	1308	19.43	10.80	279.00	
329	NABAA CHAMSINE	ZAHLE	UC-304	33°44'37"	35°57'23"	887	481.83	14.40	425.00	
330	NABAA ANJAR	ANJAR	UC-204	33°43'59"	35°56'46"	881	671.99	14.90	450.00	
331	NABAA AHLA	CHAAT	UC-304	34°08'02"	36°17'42"	992	37.12	15.00	326.00	
332	NABAA OM RAAD	LABOUE	UC-304	34°12'36"	36°20'23"	868	54.24	14.90	350.00	
333	NABAA GHABSHOUN	LABOUE	UC-304	34°14'07"	36°20'34"	822	175.14	14.20	534.00	

334	AIN EL JAMEAA	MARJHINE	UC-304	34°24'13"	36°14'47"	1727	73.26	9.20	322.00	
335	NABAA EL HAOUR	MARJHINE	UC-304	34°22'31"	36°13'46"	1729	223.56	14.52	241.00	
336	OYOUN TAQTAQ	OYOUN TAQTAQ	UC-304	34°18'02"	36°21'57"	761	24.23	14.10	561.00	
401	NABAA JEZZINE	JEZZINE	UC-304	33°32'24"	35°35'13"	1036	508.51	12.90	399.00	Flows of 1 pipes 75mm and 1 PIPE 100mm taking
407	NABAA EL ZARQA	HIDAB	UC-304	33°34'43"	35°32'05"	630	78.25	16.20	440.00	
409	NABAA EL QOBAIAA	KFARMELKI	UC-304	33°30'22"	35°28'30"	343	18.67	17.10	655.00	
410	AIN ABOU YOUNESS	KFARMELKI	UC-304	33°30'31"	35°28'13"	317	8.63	16.60	610.00	
415	AIN EL BOUSTANE	AIN BOU SOUAR	BUCKET	33°28'20"	35°31'07"	893	3.02	13.80	546.00	
418	AIN EL BARDEH	BESRI	UC-304	33°35'04"	35°32'44"	343	84.40	17.30	600.00	
419	NABAA MERCHED	MOUKHTARA	UC-304	33°39'14"	35°37'31"	808	542.76	12.70	465.00	
420	SIN EL DOUARA	AIN BOU SOUAR	BUCKET	33°28'16"	35°31'08"	879	1.03	13.70	530.00	
421	NABAA SFINTA	WADY BERTY	UC-304	33°30'26"	35°29'32"	353	6.40	17.70	400.00	
422	AIN BOU SOUAR	BOU SOUAR	BUCKET	33°28'15"	35°31'12"	933	1.01	13.70	476.00	
423	AIN EL DAIAA	KFARMELKI	BUCKET	33°30'07"	35°28'45"	412	2.84	17.60	653.00	
424	AIN EL DAIAA	JARJOUAA	BUCKET	33°26'42"	35°31'15"	782	3.25	16.30	600.00	
425	AIN EL HECHACHE	JARJOUAA	BUCKET	33°26'35"	35°31'13"	716	1.95	15.90	580.00	
502	NABAA BOU HALQA	BOHSAS	50/100	34°24'25	35°48'56"	1	1274.70	18.60	609.00	of the given discharge are p
504	NABAA EL AAJOUZ	CHEQA	50/100	34°20'20"	35°43'46"	1	25.67	16.90	728.00	

45,022.93 l/sec
3,889,981 m3/d
1,419.84 mcm/y

LABORATORY RESULTS FOR WATER QUALITY 1 - RIVERS (JANUARY 2003)

CODE		601	602	603	604	605	606	607	608	609
RIVER		EL KABIR	DEIR ZENE	EL BARED	ABOU ALI	EL JAOUZ	BEIRUT	EL KEBIR	BEIRUT	DAMOUR
pH	pH Unit	8.09	8.22	7.96	8.31	8.15	7.76	8.07	7.9	8.09
BOD	mg/L	1.4	2.1	0.9	1.1	0.7	2.3	1.3	1.9	0.8
COD	mg/L	5.3	5.7	5.2	7.1	1.2	5.2	4.4	5.2	1.2
Suspended Solids	mg/L	39.4	13.2	17.4	3.6	12.1	70	32.4	116.2	9.8
Dissolved Oxygen	mg/L	8.1	9.92	9.9	10.05	8.84	7.68	11.2	6.64	10.12
Total Nitrogen	mg/L	0.23	0.076	0.0934	0.193	0.037	0.187	0.053	0.653	0.039
Total Phosphorus	mg/L	0.12	0.08	0.05	0.16	0.06	0.02	0.08	0.12	<0.01
Chloride, Cl	mg/L	20.8	14.8	12.2	11.2	8.0	9.2	9.1	17.3	14.6
Total Coliform	CFU/100ml	1,600	13,500	5,400	3,900	1,340	20,000	1,000	4,500	1,700
Fecal Coliform	CFU/100ml	1,100	12,500	3,950	3,750	600	2,500	800	1,800	300

CODE		610	611	612	613	614	615	616	617
RIVER		AWALI	BARDE	ZAHRANI	LOWER LITANI	UPPER LITANI	EL AASSI	ARQA	AACHQOUT
pH	pH Unit	8.05	8.17	8.15	8.08	7.82	8.27	8.02	8.04
BOD	mg/L	1.1	1.8	1.4	1.9	2.8	1.1	0.64	0.3
COD	mg/L	4.3	3.8	3.2	3.6	10.8	2.6	5.4	3.4
Suspended Solids	mg/L	482	223	157	296	449	0.7	6.2	18.5
Dissolved Oxygen	mg/L	9.28	10.04	9.12	9.21	7.48	10.6	8.82	10.52
Total Nitrogen	mg/L	0.323	0.282	0.281	0.244	0.656	0.067	0.01	0.012
Total Phosphorus	mg/L	0.031	0.038	0.042	0.035	0.162	0.01	0.02	0.05
Chloride, Cl	mg/L	15.7	17.4	10.4	14.2	29.6	7.4	15.7	11.0
Total Coliform	CFU/100ml	48,000	63,000	55,000	30,000	12,000	830	1,500	200
Fecal Coliform	CFU/100ml	9,000	23,000	30,000	3,500	5,000	150	1,100	100

LABORATORY RESULTS FOR WATER QUALITY 1 - SEA WATER (JANUARY 2003)

CODE		701	702	703	704	705
LOCATION		TRIPOLI	JOUNIEH	RAS-BEIRUT	DBAYEH	SAIDA
pH	pH Unit	7.98	8.25	8.18	8.23	8.08
BOD	mg/L	1.5	2.1	2.8	1.7	2.3
COD	mg/L	920	960	246	241	1160
Suspended Solids	mg/L	4.6	5.3	10.4	27.2	22.7
Dissolved Oxygen	mg/L	4.1	5.4	8.6	8.93	5.5
Total Nitrogen	mg/L	0.289	0.67	6.92	9.94	0.52
Total Phosphorus	mg/L	0.1	0.02	0.03	0.01	0.02
Chloride, Cl	mg/L	17,748	18,620	10,486	20,097	18,444
Total Coliform	CFU/100ml	120	90	300	16	0
Fecal Coliform	CFU/100ml	40	8	150	2	0

LABORATORY RESULTS FOR WATER QUALITY 1 - SPRINGS (JANUARY 2003)

CODE		101	112	116	135	140	146	148	201	202
SPRING		FNEIDEQ	ES-SAFA	HAMADE	DALLI	KADISHA	MABKHA	EL-FOUAR	BAROUK	ES-SAFA
pH	pH Unit	7.64	7.63	7.96	7.95	7.90	7.77	7.50	7.78	8.06
BOD	mg/L	0.2	0.3	0.8	0.2	<0.1	<0.1	1.2	<0.1	<0.1
COD	mg/L	0.8	0.9	1.1	0.7	0.5	<0.1	1.6	0.2	0.1
Ammonia	mg/L	0.1259	0.14	0.04	0.0248	<0.010	<0.010	0.029	<0.01	0.018
Total Nitrogen	mg/L	0.128	0.149	0.048	0.0256	<0.010	<0.010	0.031	<0.01	0.029
Total Phosphorus	mg/L	<0.01	0.01	<0.01	0.11	<0.01	<0.01	0.07	0.01	0.03
Chloride, Cl	mg/L	6.5	11.5	11.3	7.7	4.2	4.7	25.2	4.2	5.7
Total Coliform	CFU/100ml	13	200	400	0	0	0	500	1	75
Fecal Coliform	CFU/100ml	0	0	0	0	0	0	100	1	8

CODE		216	219	246	248	258	305	315	318
SPRING		EL-QANA	SANNINE	EL-HISSAN	DAYSHOUNIEH	EL-DALAA	QAA-ER-RIM	EL-QAA	RAS-BAALBECK
pH	pH Unit	7.96	7.95	7.80	7.52	7.47	8.04	7.92	7.97
BOD	mg/L	0.2	<0.1	<0.1	3.1	<0.1	0.4	0.2	0.2
COD	mg/L	2.7	0.1	0.1	5.2	0.4	1.5	2.1	0.8
Ammonia	mg/L	0.0366	0.012	0.0219	0.085	<0.01	0.1342	0.0464	0.0241
Total Nitrogen	mg/L	0.0412	0.0137	0.0364	0.092	0.011	0.15	0.049	0.026
Total Phosphorus	mg/L	<0.01	<0.01	0.02	0.05	0.12	0.02	0.03	0.03
Chloride, Cl	mg/L	7.8	3.8	5.9	14.4	14.8	5.3	4.8	15.7
Total Coliform	CFU/100ml	0	0	0	2000	51	18	42	1320
Fecal Coliform	CFU/100ml	0	0	0	270	22	4	5	70

LABORATORY RESULTS FOR WATER QUALITY 2 - COASTAL SPRINGS (JANUARY 2003)

CODE NO.		183	184	188	189	502	503	504	508	509	510
SPRING		EL-BORJ	CHARCHARA	EL-SAKHRA	EZ-ZARQA	BOU-HALQA	EL-JRADI	EL-AAJOUZ	EL-AAQAYBE	MAAMELTEIN	EL-TEFFAHA
pH	pH Unit	7.05	7.21	7.07	7.07	6.92	7.35	7.16	7.4		7.25
Chloride, Cl	mg/L	34.4	34.7	25.4	23.1	24.4	19.1	78.3	76.9	1,122	134.2
Sodium, Na	mg/L	22.1	21.6	16.2	13.6	15.4	12.1	49.8	49.2	794	85.7
Potassium, K	mg/L	2	2.4	1.1	0.96	0.74	1.1	2.4	2.1	21.4	5.2
Calcium, Ca	mg/L	180.8	155.2	148	147.2	105.6	80.8	88	80	112.1	84.8
Magnesium, Mg	mg/L	20.4	10.3	12.2	9.2	6.2	5.3	7.3	5.8	47.4	8.7
Iron, Fe	mg/L	0.01	0.01	0.01	0.01	0.02	0.01	0.02	0.02	0.07	0.02
Bicarbonate (HCO3)	mg/L as $CaCO_3$	306	292	317	340	254	201	212	211		206
Sulfate, SO4	mg/L	142.5	102.3	75.9	76.4	22.1	14.2	27.1	26.3	275	45.1

LABORATORY RESULTS FOR WATER QUALITY 2 - SPRINGS AT HIGH ELEVATION (JANUARY 2003)

CODE		120	126	127	128	131	134	141	142	143	153
SPRING		ES-SAOUDA	EL-FOUAR	EL-HOUALIE	EL-BAIDA	EL-ASFAR	EL-JDID	NBAT	SEMAAN	HADDAD	EL-JOUANI
pH	pH Unit	7.94	7.66	7.71	8.25	8.03	7.8	7.8	7.96	7.83	8.18
Chloride, Cl	mg/L	5.2	3.3	5.4	5.1	4.9	4.5	4.5	3.8	5.1	4.7
Sodium, Na	mg/L	3.7	2.3	3.5	3.3	2.8	2.9	3	2.4	3.2	3.1
Potassium, K	mg/L	0.29	0.19	0.86	0.79	0.32	0.38	0.35	0.29	0.38	0.4
Calcium, Ca	mg/L	59.2	43.2	58.4	40	41.7	41.7	41.6	30.7	41.7	56
Magnesium, Mg	mg/L	6	6.8	5.2	5.3	3.4	3.4	4.1	7.8	3.4	5.8
Iron, Fe	mg/L	0.01	0.01	0.09	0.26	<0.01	<0.01	0.01	<0.01	<0.01	0.02
Bicarbonate (HCO3)	mg/L as $CaCO_3$	167	174	164	113	128	172	132	99	128	168
Sulfate, SO4	mg/L	13.2	0.3	15.3	11.2	13.2	0.2	1.2	0.4	1.2	9.2

CODE		147	161	168	169	174	212	233	234	235	260
SPRING		EL-AARBIT	ARID-EL MSALLEM	EL-CHELLAL	CHAIAA	EL-HARFOUCH	EL-LABAN	EL-BARBRISSE	EL-BAHRA	EL-QARSIS	EL-SAOUDA
pH	pH Unit	7.89	8.22	7.56	8.00	8.02	8.03	7.8	7.9	7.55	7.9
Chloride, Cl	mg/L	3.6	5.4	4.2	4.2	3.9	4.9	4.5	14.4	5.1	4.7
Sodium, Na	mg/L	2.3	4.1	2.8	2.8	2.5	2.8	2.9	9.1	3.2	3
Potassium, K	mg/L	0.29	0.42	0.21	0.24	0.24	0.32	0.36	0.78	0.4	0.26
Calcium, Ca	mg/L	33.6	61.1	64.5	56	28.9	32.8	44.8	45.1	49.6	52
Magnesium, Mg	mg/L	5.8	4.7	6.5	7.8	4.8	5.3	9.7	9.6	17.8	9.2
Iron, Fe	mg/L	<0.01	0.03	0.01	0.04	<0.01	0.02	0.01	0.07	<0.01	<0.01
Bicarbonate (HCO3)	mg/L as $CaCO_3$	108	178	244	157	92	216	172	175	203	196
Sulfate, SO4	mg/L	1.1	9.2	1.2	10.4	1.3	3.4	0.2	22.3	2.2	7.3

LABORATOTY RESULTS FOR WATER QUALITY 2 - LOW ELEVATION SPRINGS (JANUARY 2003)

CODE		113	136	137	138	149	152	172	176	177	178
SPRING		TAL-FI-TINE	RACHAINE	KHALDIEH	ACHACH	HADDAD	GOLOAS	EL-SET	HAMAM	GHZALI	SHAWKAT
pH	pH Unit	7.47	7.82	7.3	7.32	7.52	7.65	7.26	7.47	7.65	7.57
Chloride, Cl	mg/L	19.4	6.7	18.7	14.8	48.2	31.5	14.4	40.7	32.1	32.6
Sodium, Na	mg/L	11.8	4.5	12.9	9.2	28.2	19.8	9	25.3	20.1	20.9
Potassium, K	mg/L	1.2	0.39	0.96	0.73	1.1	0.62	0.96	1.8	0.62	0.69
Calcium, Ca	mg/L	74.4	57.9	110.4	104.2	65.1	60	100.5	58.9	46.4	51.2
Magnesium, Mg	mg/L	9.7	4.2	7.3	5.1	26.8	18.5	7.5	22.1	11.2	9.2
Iron, Fe	mg/L	0.01	0.01	0.01	0.01	0.08	0.01	0.01	0.01	0.01	0.01
Bicarbonate (HCO3)	mg/L as $CaCO_3$	236	168	260	206	199.3	216	306	236	204	209
Sulfate, SO4	mg/L	17.4	5.6	16.2	19.4	28.5	17.6	6.9	23.7	14.6	12.1

CODE		185	186	207	208	247	250	251	259	264	418
SPRING		MARKABTA	MARMAR	EL-AKHOUAT	EL-BARDEH	EL-MADIO	TANNOURA-EL-WADI	FOUAR-ANTELIAS	EL-MOUBARAK	EL-ZOUK	EL-BARDEH
pH	pH Unit	7.4	7.43	7.67	7.46	7.51	7.46	7.42	7.35	7.61	7.37
Chloride, Cl	mg/L	13.1	12.2	10.8	16.8	8	10.9	10.4	11.6	56.2	15.8
Sodium, Na	mg/L	8.2	7.6	6.7	10.8	5.6	7.4	7.1	6.9	32.7	10.9
Potassium, K	mg/L	0.8	0.78	0.52	0.72	0.49	0.72	0.92	0.48	5.3	1.4
Calcium, Ca	mg/L	81.6	74.4	75.2	91.5	73.6	81.6	80	77.6	132.8	99.2
Magnesium, Mg	mg/L	3.8	9.5	12.4	7.6	11.5	3.2	4.9	13.7	9.6	4.9
Iron, Fe	mg/L	0.01	0.01	<0.01	0.03	0.02	0.02	0.02	0.01	0.05	0.02
Bicarbonate (HCO3)	mg/L as $CaCO_3$	194	246	222	243	108	178	184	226	272	221
Sulfate, SO4	mg/L	12.6	24.3	27.1	25.2	13.9	24.1	22.6	28.3	78.6	58.4

LABORATORY RESULTS FOR WATER QUALITY 2 - SPRINGS AT MIDDLE ELEVATION (JANUARY 2003)

CODE		107	108	109	115	117	118	139	173	211	223
SPRING		JNAD	KAYLO	EL-WATIEH	ABIAD	SHABOU	CHARBI	SARKIS	EL-TINE	BATER	KHALAT
pH	pH Unit	7.79	7.7	7.36	7.2	7.71	7.41	8.16	7.46	7.72	7.67
Chloride, Cl	mg/L	8.5	8.1	15.6	15.1	14.8	9.7	3.6	14.2	8.4	8.0
Sodium, Na	mg/L	5.2	5.16	9.9	9.3	9.4	6.1	2.2	9.2	5.6	5.4
Potassium, K	mg/L	0.39	0.42	0.86	0.82	1	0.56	0.42	0.94	0.54	0.82
Calcium, Ca	mg/L	60.1	56.8	77.6	107.5	77.8	84.8	33.6	79.5	84.2	62.4
Magnesium, Mg	mg/L	20.9	9.6	22.3	15.6	11.5	8.7	8.3	19.2	8.3	10.2
Iron, Fe	mg/L	0.01	0.03	0.04	0.01	0.01	0.01	0.02	0.01	0.03	0.06
Bicarbonate (HCO3)	mg/L as CaCO3	204	198	301	336	273	246	95	275	198	159
Sulfate, SO4	mg/L	1.2	3.3	12	15.8	15.8	18.8	1.1	12.2	19.2	32.4

CODE		225	226	314	316	317	319	330	401	406	419
SPRING		ECH-CHARBINE	EZ-ZGHIR	ER-ROUAISS	MATRAFE	SOUAIKA	EL-FAKEHA	ANJAR	JEZZINE	DAOUDIYE	MERCHED
pH	pH Unit	7.59	7.63	7.79	7.81	7.78	7.86	7.61	7.68	7.24	8.13
Chloride, Cl	mg/L	5.2	3.9	4.7	5	4.2	9.3	9.6	7.6	11.7	9.6
Sodium, Na	mg/L	3.4	3.1	2.6	3.2	2.7	6.07	3.4	4.9	7.8	5.9
Potassium, K	mg/L	0.28	0.39	0.41	0.56	0.45	0.66	0.58	0.51	0.64	0.97
Calcium, Ca	mg/L	57.6	52.1	42.9	44.2	43.9	44.8	69.1	62.4	97.6	78.4
Magnesium, Mg	mg/L	11.8	9.2	6.2	6.5	6.2	7.3	7.1	5.8	5.7	5.6
Iron, Fe	mg/L	0.03	0.01	0.01	0.02	0.02	0.01	0.02	0.06	0.02	0.02
Bicarbonate (HCO3)	mg/L as CaCO3	215	192	150	152	150	162	206	185	225	212
Sulfate, SO4	mg/L	0.5	1.3	2.3	0.8	0.7	0.8	15.1	14.1	17.5	17.6

LABORATORY RESULTS FOR WATER QUALITY 2 - RIVERS (JANUARY 2003)

CODE		601	602	603	604	605	606	607	608	609	610
RIVER		EL-KABIR	OSTOUENE	EL-BARED	ABOU-ALI	EL-JAOUZ	IBRAHIM	EL-KELB	BEIRUT	DAMOUR	AWALI
pH	pH Unit	8.09	8.22	7.96	8.31	8.15	7.76	8.07	7.9	8.09	8.05
Chloride, Cl	mg/L	20.8	14.8	12.2	11.2	8	9.2	9.1	17.3	14.6	15.7
Sodium, Na	mg/L	13.9	9.6	8.1	7.3	5.2	5.8	5.9	11.2	9.2	10.6
Potassium, K	mg/L	1.05	0.87	1.4	0.7	0.69	0.52	0.42	0.94	0.83	1.3
Calcium, Ca	mg/L	51.2	67.2	68.8	70.4	67.3	68.8	70.2	85.4	75.2	76.2
Magnesium, Mg	mg/L	17.1	12.7	8.7	12.2	6.8	12.6	6.3	1.6	5.3	8.3
Iron, Fe	mg/L	0.08	0.04	0.05	0.02	0.07	0.24	0.2	0.18	0.07	0.44
Bicarbonate (HCO3)	mg/L as $CaCO_3$	187	218	189	198	208	175	172	179	168	182
Sulfate, SO4	mg/L	27.2	20.1	28.4	26.3	19.1	21.2	22.3	59.2	40.8	35.4

CODE		611	612	613	614	615	616	617	618	619	620
RIVER		SAINIQ	ZAHRANI	LOWER-LITANI	UPPER-LITANI	EL-AASSI	ARQA	ACHCOUT	UPPER LITANI	CHADRA	EL-JAOUZ
pH	pH Unit	8.17	8.15	8.08	7.82	8.27	8.02	8.04	8.01	8.02	7.9
Chloride, Cl	mg/L	17.4	10.4	14.2	29.6	7.4	15.7	11.1	10.8	9.8	9.7
Sodium, Na	mg/L	11.6	6.9	9.6	19.7	4.1	10.2	7.2	9.2	7.8	8.7
Potassium, K	mg/L	0.99	0.56	0.87	0.92	0.79	0.83	0.79	0.06	0.53	0.83
Calcium, Ca	mg/L	88.1	65.6	76.8	107.2	53.4	64.8	68.2	75.1	55.1	69.3
Magnesium, Mg	mg/L	6.8	9.2	8.7	16.4	9.8	17.6	15.1	14.2	13.7	12.4
Iron, Fe	mg/L	0.31	0.15	0.49	0.12	0.03	0.02	0.03	0.18	0.09	0.9
Bicarbonate (HCO3)	mg/L as $CaCO_3$	194	173	165	197	158	216	202	183	179	198
Sulfate, SO4	mg/L	37.2	15.4	31.1	35.4	2.2	28.2	22.1	23.4	21.4	25.2

Annex 3.6 Results of Field Survey in June 2003

1. **Measurement of River Discharge**
2. **Measurement of Spring Flow**

Rivers Gauging Data Sheet

Month: JUNE 2003

Code	Name of the River	Instrument	Observation Point (in Degree)		Altitude	Discharge	Temperature	Electro-conductivity
			x	y	(m)	(m^3/s)	(°C)	(µS/cm)
601	NAHR EL KABIR	UC-204	34°39'20"	36°18'32"	250	2.37	22.20	474
602	NAHR OSTOUENE	UC-204	34°33'50"	36°05'36"	78	1.16	19.10	513
603	NAHR EL BARED	UC-204	34°30'01"	35°57'51"	20	10.44	16.40	340
604	NAHR ABOU ALI	UC-204	34°18'33"	35°51'43"	265	3.09	14.00	286
605	NAHR EL JAOUZ	UC-204	34°16'03"	35°39'41"	4	0.63	26.70	320
606	NAHR IBRAHIM	UC-204	34°03'41"	35°39'07"	16	26.90	14.10	237
607	NAHR EL KELB	UC-204	33°57'03"	35°36'22"	17	10.50	17.40	257
608	NAHR BEIRUT	UC-204	33°52'51"	35°31'54"	7			
609	NAHR EL DAMOUR	UC-304	33°42'17"	35°26'54"	3	2.69	23.80	321
610	NAHR EL AWALI	UC-204	33°35'19"	35°32'36"	12	29.38	15.80	437
611	NAHR SAINIQ	UC-204	33°32'07"	35°21'58"	6			
612	NAHR EL ZAHRANI	UC-204	33°29'29"	35°20'39"	6			
613	LOWER LITANI	UC-204	33°19'48"	35°15'31"	2	2.62	23.10	473
614	UPPER LITANI	U-204	33°51'49"	35°59'19"	931	1.03	23.20	683
615	NAHR EL AASSI	UC-204	34°23'30"	36°24'55"	598	23.24	13.60	275
	TOTAL MEASURED	12						

608 : is dry
611 : is dry
612 : is dry

Springs Gauging Data Sheet

Code	Name of the Spring	Village	Instrument	Observation Point		Altitude	Discharge	emperatur	Electro-conductivit	Remarks
				x	y	(m)	(ltr)	(°C)	(µS/cm)	
101	NABAA FNAIDEQ	FNAIDEQ	UC-304	34°28'48"	36°12'21"	1325	279.66	9.00	403.00	
103	NABAA EL BANAT	FNAIDEQ	UC-304	34°28'38"	36°11'48"	1201	104.54	9.90	400.00	
104	AIN EL DEEK	AKKAR EL ATTICA	UC-304	34°30'15"	36°13'59"	1272	45.74	9.00	343.00	
1051	BAA EL CHOUH EL A	AKKAR EL ATTICA	UC-304	34°30'12"	36°13'57"	1336	122.78	10.30	387.00	
1052	BAA EL CHOUH EL W	AKKAR EL ATTICA	UC-304 & BUCKET	34°30'15"	36°13'58"	1271	148.03	8.90	342.00	
106	NABAA EL JAOUZ	AKKAR EL ATTICA	UC-304	34°30'25"	36°14'08"	1183	584.52	10.00	34.20	
107	BAA ECH CHEIKH JN	AKKAR EL ATTICA	UC-304	34°30'56"	36°14'51"	998	61.97	10.20	389.00	
108	NABAA OMAR KAYL	AKKAR EL ATTICA	UC-304 & BUCKET	34°30'52"	36°14'59"	1109	54.09	9.80	375.00	
109	AIN EL WATIEH	AKKAR EL ATTICA	UC-304	34°32'21"	36°14'38"	864	29.62	13.90	618.00	
110	AIN EL HOMSIYE	AKKAR EL ATTICA	BUCKET	34°31'46"	36°14'29"	729	5.63	13.50	484.00	
111	AIN AAYAT	AAYAT	UC-304	34°32'16"	36°11'59"	660	10.26	15.10	687.00	
112	NABAA ES SAFA	BOQAIAA	UC-304	34°39'18"	36°23'35"	383	1888.09	15.40	509.00	
113	TAL ET TINE	BOQAIAA	UC-304	34°39'12"	36°19'59"	281	218.30	17.70	544.00	
115	AIN EL ABIAD	QOBAIYAT	UC-304	34°32'50"	36°15'50"	672	30.19	15.00	647.00	
116	NABAA HMADE	QOBAIYAT	UC-304	34°32'02"	36°16'25"	915	64.40	12.80	540.00	
117	NABAA EL SHARQI	ANDQET	UC-304	34°32'32"	36°18'37"	790	14.81	14.20	583.00	
118	NABAA EL GHARBI	ANDQET	UC-304	34°32'46"	36°18'15"	721	96.73	14.50	486.00	
119	NABAA ECH CHEIKH	LAQLOUQ	UC-304	34°10'14"	35°52'33"	1571	31.44	8.90	359.00	
120	AIN ES SAOUDA	TANNOURINE-HARISSA	UC-304	34°11'25"	35°56'09"	1733	12.02	7.80	313.00	
122	NABAA EL MOGHRAO	TANNOURINE-BALAA	UC-304	34°10'18"	35°52'44"	1608	104.30	8.40	385.00	
123	NABAA EL KORSI	WATA HOUB	UC-304	34°11'32"	35°54'44"	1519	58.79	9.80	290.00	
126	NABAA EL FOUAR	LAQLOUQ	BUCKET	34°09'10"	35°53'34"	1955	9.10	7.10	458.00	
127	EL HOUALIF	TANNOURINE-WADI EL JORD	BUCKET	34°10'09"	35°54'57"	1691	22.50	8.70	361.00	
128	NABAA EL ANBOUB	TANNOURINE-WADI EL JORD	UC-304	34°10'07"	35°55'08"	1750	35.64	9.90	327.00	
129	AIN EL BAIDA	TANNOURINE-HARISSA	BUCKET	34°12'17"	35°58'15"	1952	5.56	8.00	347.00	
130	NABAA EL AHMAR	TANNOURINE-HARISSA	UC-304	34°11'59"	35°57'22"	1767	10.81	7.90	360.00	
131	NABAA EL ASFAR	TANNOURINE-HARISSA	UC-304	34°11'57"	35°57'19"	1746	3.91	8.40	371.00	
132	NABAA HAZRITA	TANNOURINE -WADI EL JORD	BUCKET	34°10'18"	35°53'38"	1607	4.00	8.70	321.00	
133	NABAA EL MOKHADA	TANNOURINE	UC-304	34°10'39"	35°54'18"	1460	6.89	11.00	390.00	
134	NABAA EL JDID	TANNOURINE-HARISSA	BUCKET	34°11'55"	35°57'32"	1841	12.50	6.50	315.00	
135	NABAA DALLI	KFARHILDA	UC-304	34°13'11"	35°50'41"	623	674.04	13.00	389.00	
136	NABAA RACHAAINE	RACHAAINE	UC-304	34°23'15"	35°55'50"	157	6826.40	10.00	205.00	
137	AIN EL KHALDIEH	KHALDIEH	UC-304	34°22'14"	35°54'20"	147	22.51	18.20	613.00	
138	AYOUN ACHACH	ACHACH	UC-304	34°25'20"	35°56'29"	220	11.17	19.30	515.00	

139	NABAA MAR SARKIS	EHDEN	UC-304	34°17'21"	35°58'58"	1510	775.86	5.80	181.00	Flows of 2 pipes 200mm and 150mm taking water
140	NABAA KADISHA	BCHARRE	UC-304	34°14'38"	36°02'10"	1708	1242.29	5.00	228.00	
141	NABAA NBAT	BCHARRE	UC-304	34°15'41"	36°01'24"	1768	1170.98	5.70	178.00	
142	NABAA MAR SEMAAN	BCHARRE	UC-304	34°15'43"	36°00'34"	1753	1109.59	5.60	182.00	
143	AIN EL HADDAD	BCHARRE	UC-304	34°15'41"	35°59'42"	1545	104.88	9.50	305.00	
145	NABAA EL JOUANI	BEQAAKAFRA	UC-304	34°13'30"	36°02'03"	1931	32.17	8.80	259.00	
146	AIN MABKHA	BAZOUN	UC-304	34°13'37"	35°59'42"	1732	99.51	6.80	240.00	
147	NABAA EL AARBIT	BEQAAKAFRA	UC-304	34°13'27"	36°00'17"	1770	63.64	5.40	192.00	
148	AIN EL FOUAR	ES SOUAISSI	UC-304	34°33'16"	36°06'57"	148	41.03	19.60	584.00	
149	NABAA EL HADDAD	SAADINE	UC-304	34°35'30"	36°05'17"	51	17.14	20.50	617.00	
152	NABAA EL QOLQAS	KOUAIKHAT	UC-304	34°34'23"	36°05'43"	84	7.94	21.00	589.00	
164	AIN EL AFSA	TANNOURINE-HARISSA	BUCKET	34°12'01"	35°56'48"	1663	15.00	10.30	353.00	
165	ARID EL MSALLEM	TANNOURINE-HARISSA	BUCKET	34°12'10"	35°57'33"	1787	6.67	8.70	362.00	
166	NABAA EL KORSI	TANNOURINE-WADI EL JORD	BUCKET	34°10'14"	35°54'46"	1686	2.86	12.10	333.00	
168	NABAA EL CHELLAL	LAQLOUQ	BUCKET	34°09'14"	35°54'07"	1972	6.00	6.00	324.00	
169	NABAA CHAIAA	TANNOURINE -WADI EL JORD	UC-304 & BUCKET	34°10'07"	35°55'17"	1748	12.88	6.30	302.00	
170	NABAA EL TINE	AKKAR EL ATTICA	UC-304	34°31'39"	36°14'03"	655	23.63	14.40	545.00	
171	AIN EL TAQIYEH	AKKAR EL ATTICA	UC-304	34°31'21"	36°14'12"	663	97.19	12.10	428.00	
172	AIN EL SET	QOBAIYAT	UC-304	34°33'24"	36°16'47"	614	34.78	13.80	613.00	
173	AIN EL TINE	ANDQET	UC-304	34°32'42"	36°18'32"	731	12.76	14.00	562.00	
174	NABAA EL HARFOUCH	BCHARRE	UC-304	34°15'43"	36°01'17"	1773	77.82	5.50	177.00	
176	NABAA EL HAMAM	CHIR EL HMAIRIEH	UC-304	34°37'55"	36°05'49"	22	162.70	21.50	689.00	
177	NABAA GHZAILI	GHZAILI	UC-304	34°35'36"	36°06'20"	97	80.14	21.10	509.00	
178	NABAA ABOU SHAWKA	KOUAIKHAT	UC-304	34°34'20"	36°05'51"	84	26.97	21.30	487.00	
179	NABAA SIR	SIR EL DANNIYE	UC-304	34°23'00"	36°01'42"	908	1479.84	7.20	179.00	Flow of a large number of pipes taking water from the
180	NABAA QSSEM	BEQAARHABOUNE	UC-304	34°22'21"	36°02'06"	1094	12560.40	6.50	172.00	Flow of a large number of pipes taking water from the
181	NABAA SUCCAR	BEQAARHABOUNE	UC-304	34°22'02"	36°04'58"	1676	10268.08	4.30	180.00	
182	NABAA CHQEIQ	KFARBIBNIT	UC-304	34°24'09"	36°04'30"	1134	55.65	11.80	439.00	
183	AIN EL BORJ	MINIEH	UC-304	34°29'51"	35°56'20"	10	17.57	18.50	967.00	
184	AIN EL CHARCHARA	MINIEH	UC-304	34°29'46"	35°56'12"	4	177.12	18.50	884.00	
185	AIN MARKABTA	MARKABTA	UC-304	34°27'01"	35°57'58"	275	23.67	19.10	391.00	
186	AIN MARMAR	OYOUN ES SAMAK	UC-304	34°26'29"	36°01'27"	243	17.39	16.70	522.00	
187	AIN ES SAYED	OYOUN ES SAMAK	UC-304	34°26'21"	36°00'10"	216	309.92	15.10	458.00	
188	AIN EL SAKHRA	MINIEH	UC-304	34°29'40"	35°56'01"	0	4.99	19.30	953.00	
189	AIN EZ ZARQA	MINIEH	UC-304	34°29'40"	35°56'09"	27	39.35	18.90	948.00	
201	NABAA EL BAROUK	BAROUK	UC-304	33°42'42"	35°41'35"	1089	3235.25	10.30	262.00	

202	NABAA ES SAFA	SAFA	UC-304	33°45'07"	35°42'01"	914	2484.98	11.10	280.00	
207	NABAA EL AKHOUAT	WADI BNEHLAY	UC-304	33°41'14"	35°32'18"	443	173.49	15.70	490.00	
208	AIN EL BARDEH	WADI BNEHLAY	UC-304	33°40'55"	35°31'43"	389	21.94	16.60	551.00	
211	NABAA BATER	BATER ECH CHOUF	UC-304	33°35'58"	35°37'04"	971	195.52	13.40	435.00	
212	NABAA EL AASAL	FARAYA	UC-304	34°00'35"	35°50'18"	1551	1255.05	5.30	184.00	
213	NABAA EL LABAN	KFARDEBIAN	UC-204	33°59'42"	35°49'42"	1646	5326.94	4.50	158.00	
214	AIN ED DELBE	FARAYA	UC-304	34°00'38"	35°49'27"	1279	51.02	7.50	237.00	
215	NABAA EL MGHARA	HRAJEL	UC-304	34°00'43"	35°48'02"	1542	19.64	9.70	374.00	
216	NABAA EL QANA	HRAJEL	UC-304	34°02'32"	35°48'31"	1580	33.52	7.90	283.00	
2171	NABAA ECH CHHARIF	MAIROUBA	UC-304	34°01'03"	35°46'05"	1292	4.37	16.30	215.00	
2172	NABAA ES SOUANE	MAIROUBA	BUCKET/UC-304	35°00'54"	35°46'11"	1308	6.37	11.70	341.00	
2181	NABAA EL SANNOUR	MAIROUBA	BUCKET	34°01'29"	35°46'54"	1332	0.90	14.30	341.00	
2182	NABAA EL TANNOUR	MAIROUBA	BUCKET	35°01'12"	35°46'26"	1319	3.57	12.40	682.00	
219	NABAA SANNINE	BASKINTA	UC-304	33°56'12"	35°50'31"	1674	436.24	5.50	181.00	
220	NABAA JAOUZ EL NEM	BASKINTA	UC-304	33°55'49"	35°50'18"	1655	55.28	8.10	268.00	
223	NABAA KHALAF	QARTABA	BUCKET	34°05'47"	35°51'02"	1189	2.08	15.50	405.00	
224	RAS EN NABAA	QARTABA	UC-304	34°06'33"	35°51'23"	1329	17.81	11.90	403.00	
225	NABAA ECH CHARBIN	ECH CHARBINE	UC-304	34°07'03"	35°51'32"	1578	12.39	10.00	327.00	
226	NABAA EZ ZOHIR	ECH CHARBINE	BUCKET	34°07'04"	35°51'31"	1599	10.42	9.60	314.00	
227	NABAA EL KBIR	ECH CHARBINE	BUCKET	34°07'14"	35°51'58"	1585	12.35	9.00	318.00	
228	NABAA EL FOUAR	ECH CHARBINE	UC-304	34°07'16"	35°51'33"	1621	34.03	8.00	285.00	
229	NABAA EZ ZEIN	MGHAIRI	UC-304	34°06'18"	35°52'25"	1237	14.23	10.90	398.00	
230	NABAA BOU SALHAB	MGHAIRI	UC-304	34°06'18"	35°52'44"	1195	33.04	12.40	395.00	
231	NABAA EL TOUTE	YANOUH	UC-304	34°05'57"	35°52'47"	1106	10.92	12.70	555.00	
232	NABAA EL ROUAISS	AAKOURA	UC-304	34°06'35"	35°54'26"	1300	3880.00	7.60	199.00	
233	AIN EL BARBRISSE	AAKOURA	UC-304	34°09'05"	35°52'58"	1904	19.70	7.30	333.00	
234	AIN EL BAHRA	AAKOURA	UC-304	34°08'31"	35°53'04"	1861	18.50	8.40	336.00	
235	AIN EL QASSIS	AAKOURA	UC-304	34°08'44"	35°52'37"	1818	8.64	7.70	405.00	
236	AIN EL JAOUZ	AAKOURA	UC-304	34°08'18"	35°55'43"	1658	52.00	8.00	224.00	
237	AIN RICHMI	AAKOURA	UC-304	34°07'28"	35°55'06"	1608	31.84	8.30	219.00	
238	AIN SNITA	AAKOURA	UC-304	34°07'01"	35°54'22"	1307	23.83	11.20	418.00	
239	AIN ELIAS	AAKOURA	UC-304	34°07'32"	35°52'53"	1500	13.08	10.90	295.00	
240	AIN EL BLATA	AAKOURA	UC-304	34°07'57"	35°52'43"	1666	4.80	10.40	309.00	
241	AIN EL DAIAA	AAKOURA	BUCKET	34°07'14"	35°54'16"	1382	11.64	9.00	311.00	
245	AIN EL SAFRA	AFKA	UC-304	34°04'13"	35°53'13"	1145	36.02	11.10	330.00	
246	AIN EL HISSAN	AFKA	UC-304	34°04'08"	35°53'06"	1182	64.61	10.30	296.00	

247	NABAA EL MADIQ	YAHCHOUCH	UC-204	34°05'03"	35°42'07"	170	1870.62	15.80	410.00	
248	BAA EL DAYSHOUNI	DAYSHOUNIEH	UC-204	33°50'25"	35°35'19"	110	576.16	16.90	540.00	
250	TANNOUR EL WADI	ANTELIAS	UC-304	33°54'43"	35°35'52"	32	54.19	15.60	447.00	
251	FOUAR ANTELIAS	ANTELIAS	UC-304	33°54'42"	35°35'55"	30	1545.26	15.30	430.00	
256	NABAA EL QAA	SAFA	UC-304	33°44'57"	35°42'05"	981	751.65	11.30	261.00	
257	NABAA ET TANNOUR	SAFA	UC-304	33°44'57"	35°42'08"	997	236.66	11.30	260.00	
258	AIN EL DAIAA	AIN ZHALTA	BUCKET	33°44'35"	35°42'08"	1082	1.66	12.50	485.00	
259	ABAA EL MOUBARA	DEIR DOURIT	UC-304	33°41'14"	35°32'22"	465	15.32	15.90	495.00	
260	AIN ES SAOUDA	AAKOURA	BUCKET	34°08'19"	35°53'15"	1820	1.53	8.20	354.00	
261	DOUAR EL MARJEH	AAKOURA	UC-304	34°07'57"	35°59'14"	1703	9.46	9.70	382.00	
262	NABAA EL HOUAIRI	QARTABA	BUCKET	34°06'22"	35°51'12"	1301	3.13	14.00	327.00	
263	NABAA EL WAHLI	QARTABA	BUCKET	34°06'28"	35°51'17"	1314	2.22	13.50	250.00	
305	QAA ER RIM	ZAHLE	UC-304	33°53'10"	35°52'19"	1227	6009.07	8.70	208.00	Flow of pipe 50mm taking water from the spring is not
308	NABAA CHTOURA	CHTOURA	UC-304	33°49'25"	35°51'03"	929	860.98	12.50	315.00	
309	ABAA ECH CHAGHOU	OUADI NAHLE	UC-304	34°02'44"	36°17'26"	1380	11.68	14.60	259.00	Flow of pipe 75mm taking water from the spring is not
310	NABAA EL FOUARA	OUADI NAHLE	UC-304	34°04'26"	36°19'11"	1550	338.92	9.50	268.00	
311	BAA HAQL EL TEFFA	OUADI NAHLE	UC-304	34°04'09"	36°18'32"	1487	23.54	11.40	308.00	
312	NABAA EM MELHEM	OUADI NAHLE	UC-304	34°03'24"	36°17'49"	1472	97.01	11.60	317.00	
314	NABAA ER ROUAISS	LABOUE	UC-304	34°11'48"	36°21'09"	906	529.61	12.80	265.00	
315	NABAA EL QAA	LABOUE	WEIR	34°11'52"	36°21'09"	908	418.83	12.80	268.00	Flows of 2 pipes 200mm and 150mm taking water
316	NABAA MATRAFE	LABOUE	UC-304	34°11'51"	36°21'07"	903	296.55	12.80	269.00	
317	NABAA SOUAIKA	LABOUE	UC-304	34°11'48"	36°21'10"	903	110.15	12.90	269.00	
318	ABAA RAS BAALBEC	RAS BAALBECK	UC-304	34°15'38"	36°25'02"	989	34.73	17.70	447.00	
319	NABAA EL FAKEHA	FAKEHA	UC-304	34°14'31"	36°24'25"	981	96.82	17.80	368.00	
320	RAS EL AIN	BAALBECK	UC-304	33°59'58"	36°12'59"	1170	1212.92	13.60	295.00	Flows of 2 pipes 200mm and 150mm taking water
321	ABAA EL YAMMOUN	YAMMOUNEH	UC-304	34°07'18"	36°02'00"	1360	2138.03	8.80	205.00	springs are collected into 1 c
323	RAS EL MAL	HERMEL	UC-304	34°23'25"	36°22'17"	786	192.79	11.20	262.00	
324	NABAA EL RAYSEH	HERMEL	UC-304	34°23'31"	36°22'28"	759	8.38	11.80	269.00	
325	NABAA EZ ZHOUR	SAADNAYEL	UC-304	33°49'18"	35°52'30"	910	69.80	16.60	507.00	
327	EHDAASHARIEH	HERMEL	UC-304	34°23'29"	36°22'39"	777	74.75	12.00	280.00	
328	NABAA EL TAQA	ZAHLE	UC-304	33°52'42"	35°51'49"	1308	23.37	10.70	276.00	
329	NABAA CHAMSINE	ZAHLE	UC-304	33°44'37"	35°57'23"	887	587.89	15.50	402.00	
330	NABAA ANJAR	ANJAR	UC-304	33°43'59"	35°56'46"	881	682.73	15.40	428.00	
331	NABAA AHLA	CHAAT	UC-304	34°08'02"	36°17'42"	992	140.39	15.60	333.00	
332	NABAA OM RAAD	LABOUE	UC-304	34°12'36"	36°20'23"	868	185.05	15.50	541.00	
333	NABAA GHABSHOUN	LABOUE	UC-304	34°14'07"	36°20'34"	822	175.17	16.00	542.00	
334	AIN EL JAMEAA	MARJHINE	UC-304	34°24'13"	36°14'46"	1718	9.65	9.80	333.00	

335	NABAA EL HAOUR	MARJHINE	UC-304	34°22'23"	36°13'28"	1728	208.70	9.50	275.00	
336	OYOUN TAQTAQ	OYOUN TAQTAQ	UC-304	34°18'02"	36°21'57"	761	67.77	17.20	551.00	
401	NABAA JEZZINE	JEZZINE	UC-304	33°32'24"	35°35'13"	1036	408.57	14.20	387.00	Flows of 1 pipes 75mm and 1 PIPE 100mm taking
407	NABAA EL ZARQA	HIDAB	UC-304	33°34'43"	35°32'05"	630	61.92	16.20	440.00	
409	NABAA EL QOBAIAA	KFARMELKI	UC-304	33°30'22"	35°28'30"	343	12.75	16.90	659.00	
410	AIN ABOU YOUNESS	KFARMELKI	UC-304	33°30'31"	35°28'13"	317	19.79	17.40	602.00	
415	AIN EL BOUSTANE	AIN BOU SOUAR	BUCKET	33°28'20"	35°31'07"	893	6.13	14.40	482.00	
418	AIN EL BARDEH	BESRI	UC-304	33°35'04"	35°32'44"	343	88.04	17.50	611.00	
419	NABAA MERCHED	MOUKHTARA	UC-304	33°39'14"	35°37'31"	808	84.43	14.10	467.00	
420	SIN EL DOUARA	AIN BOU SOUAR	BUCKET	33°28'16"	35°31'08"	879	6.10	13.90	509.00	
421	NABAA SFINTA	WADY BERTY	BUCKET	33°30'26"	35°29'32"	353	2.27	17.60	356.00	
422	AIN BOU SOUAR	BOU SOUAR	BUCKET	33°28'15"	35°31'12"	933	6.51	13.00	475.00	
423	AIN EL DAIAA	KFARMELKI	BUCKET	33°30'07"	35°28'45"	412	1.66	17.80	638.00	
424	AIN EL DAIAA	JARJOUAA	BUCKET	33°26'42"	35°31'15"	782	9.13	16.00	553.00	
425	AIN EL HECHACHE	JARJOUAA	BUCKET	33°26'35"	35°31'13"	716	1.13	15.80	568.00	
502	NABAA BOU HALQA	BOHSAS	UC-204	34°24'25	35°48'56"	1	1323.33	18.90	601.00	of the given discharge are p
504	NABAA EL AAJOUZ	CHEQA	UC-304	34°20'20"	35°43'46"	1	23.54	16.70	621.00	

Annex 4

Groundwater Resources Development Potential

Annex 4.1 Water balance at Each Basin under Current Condition

(Yearly average, since 1992 to 2001)

(Unit: 1,000 m3)

Basin	Area Km2	Surface Water Balance									Groundwater Balance						VoLume
		In				Out				Balance	In		Out			Balance	
		Rain	Runin	Spring	Inlet	Recharge	Evap	RunOff	Intake		Recharge	Ginflow	ExistWith	SprUp	GOutflow		
[1]	15.1	11,369				7,921	2,994	575	11	-132	7,921		3,854		4,888	-821	834,089
[2]	70.6	63,223	575	38		38,977	14,110	3,237	69	-557	36,977	838	5,900	38	41,279	-9,401	3,492,181
[3]	112.8	84,992	3,237			53,775	27,911	7,146	130	-733	53,775	5,671	3,887		70,771	-14,992	3,872,052
[4]	100.9	76,130	7,146			14,972	33,896	34,520	186	-298	14,972	55,102	4,991		65,904	-821	1,841,345
[5]	34.2	25,807	34,520			5,108	11,439	43,786	98	-100	5,106	53,698	11,735		47,154	-84	869,875
Kebir	333.5	251,520	0	38	-	118,761	90,350	43,786	492	-1,921	118,761	0	30,147	38	114,687	-16,908	10,909,330
[6]	46.2	34,803				16,558	9,799	9,504	67	-124	16,558	35,012	2,794		51,941	-4,185	1,782,181
[7]	24.8	18,705	9,503	10,331		8,095	7,059	23,592	91	-297	8,095	49,528	829	10,331	46,815	-353	499,108
[8]	68.9	51,973	23,592			12,798	20,291	42,168	681	-252	12,798	61,712	1,011		73,800	-301	1,194,852
[9]	29.8	22,481	42,168			9,298	8,570	45,830	1,118	-167	9,298	73,855	10,582		72,675	-113	456,352
Ostuene	169.6	127,962	0	10,331	-	45,749	45,718	45,830	1,836	-840	45,749	85,792	15,225	10,331	90,917	-20,216	3,942,469
[10]	49.5	37,341		16		19,677	10,041	7,739	52	-152	19,677	16,434	3,266	16	35,710	-3,880	1,210,055
[11]	54.0	40,786	7,739	8,712		13,848	14,575	29,281	193	-661	13,848	35,880	1,116	8,712	40,752	-850	1,138,103
[12]	15.0	11,343	29,281			5,461	4,005	31,380	10	-231	5,461	40,582	59		46,308	-314	401,837
[13]	14.5	10,859	31,380			5,292	3,866	33,322	34	-176	5,292	43,774	2,849		46,325	-108	221,685
Akkar	133.1	100,429	0	8,728	-	44,278	32,487	33,322	289	-1,220	44,278	16,145	7,289	8,728	49,559	-16,187	2,971,683
[14]	103.8	78,226		16,275		48,760	21,903	24,132	176	-471	48,760	31,914	654	16,275	70,463	-8,719	4,048,610
[15]	108.2	81,537	24,132	95,560		43,124	23,745	130,197	4,835	-473	43,124	71,885	20,264	95,560	230	-1,035	2,636,719
[16]	40.5	30,534	130,188			17,288	8,877	134,204	670	-308	17,288		5,400		15,852	-3,964	965,004
[17]	13.9	10,484	134,205			3,739	4,737	136,054	259	-120	3,739	20,380	1,559		22,699	-37	209,824
Bared	266.3	200,761	0	111,835	-	112,911	59,262	136,054	5,739	-1,372	112,912	46,218	27,867	111,835	30,183	-11,755	7,880,158
[18]	157.6	118,783		20,731		53,421	33,527	52,977	172	-604	53,421		2,072	20,731	35,492	-4,874	7,448,488
[19]	37.6	28,310	52,977	15,792		14,824	8,131	74,249	45	-188	14,824	4,065	468	15,792	2,819	-190	882,237
[20]	96.4	72,688		123,354		33,397	20,639	141,082	1,336	-414	33,397	103,652	6,824	123,354	7,287	-416	2,081,447
[21]	80.6	60,743	215,331			39,172	16,550	220,851	220	-720	39,172	17,853	3,257		61,921	-8,154	2,218,687
[22]	112.8	85,123	220,852			46,663	30,183	228,617	1,858	-1,345	46,663	65,122	6,792		108,053	-2,080	2,300,131
Abou Ali	484.9	365,627	0	159,877	-	187,479	109,030	228,617	3,830	-3,252	187,479	98,589	18,413	159,877	123,450	-17,790	14,820,980
[23]	44.2	33,303				19,255	9,831	4,293	121	-197	19,255		2,675		21,715	-5,135	1,644,685
[24]	35.7	26,876	4,293			14,618	8,330	8,314	66	-156	14,618	91	828		17,852	-3,971	1,232,402
[25]	57.3	43,209	8,314	9,983		23,572	13,492	24,693	93	-345	23,572	16,407	709	9,983	34,065	-2,779	1,685,813
[26]	49.2	34,474	24,693			12,407	13,985	33,266	149	-619	12,407	26,855	813		39,629	-979	950,754
Jouz	186.3	137,862	0	9,983	-	69,852	45,618	33,266	429	-1,319	69,852	6,708	4,825	9,983	74,618	-24,311	5,413,656
[27]	189.7	142,964		247,495		86,419	45,521	258,336	1,561	-1,359	86,419	188,470	1,592	247,495	7,071	-1,270	3,198,847
[28]	64.7	48,798	258,337	35,152		22,853	17,355	302,285	208	-494	22,953	19,086	6,879	35,152	436	-428	1,336,805
[29]	58.6	44,141	302,285			25,052	14,754	307,012	120	-531	25,052	14,932	546		45,019	-5,581	1,163,284
[30]	33.7	23,609	307,011			14,852	9,324	306,988	61	-804	14,852	1,946	843		17,183	-1,028	691,062
Ibrahim	346.7	259,532	0	282,647	-	149,276	86,964	306,988	1,951	-2,988	149,276	197,813	9,660	282,647	63,088	-16,192	6,297,798
[31]	62.1	46,814				23,808	14,378	8,997	108	-277	23,808	16,565	486		46,058	-8,351	1,828,171
[32]	128.7	97,000	8,997	6,741		27,118	31,727	54,390	339	-834	27,118	122,096	9,488	6,741	140,469	-7,487	3,114,288
[33]	64.1	48,352	54,390	99,462		18,788	16,591	165,591	1,528	-294	18,788	147,322	590	99,462	66,687	-629	986,385
Kelb	254.9	192,166	0	106,203	-	69,512	62,696	165,591	1,875	-1,405	69,512	119,864	10,544	106,203	87,098	-7,315	5,728,840

Annex 4-1(2)

Basin	Area Km2	Surface Water Balance									Groundwater Balance						VoLume
		In				Out				Balance	In		Out			Balance	
		Rain	Runin	Spring	Inlet	Recharge	Evap	RunOff	Intake		Recharge	Ginflow	ExistWith	SprUp	GOutflow		
[34]	143.6	108,210				58,840	33,969	15,682	328	-609	58,840	17,227	4,072		88,335	-16,340	4,990,766
[35]	61.3	46,239	15,882	8,542		28,483	14,777	27,166	406	-349	28,483	2,364	1,182	8,542	24,996	-3,872	1,799,240
[36]	65.0	45,556	27,166	19,862		26,800	17,616	48,105	1,084	-1,021	26,800	23,568	1,936	19,862	29,213	-642	629,636
[37]	40.0	28,048	48,105	23		4,018	11,570	60,809	537	-758	4,018	11,363	1,854	23	13,582	-59	256,467
Beirut	309.9	228,052	0	28,427	-	118,120	77,932	60,809	2,355	-2,736	118,119	18,409	9,025	28,427	119,991	-15,854	7,866,108
[38]	27.6	20,810				10,846	6,361	3,827	97	-122	10,846	50,448	922		60,688	-518	880,702
[39]	24.5	18,434	3,827	36,895		10,038	6,148	38,614	4,889	-234	10,038	60,251	7,769	36,985	26,046	-521	1,912,939
[40]	119.3	89,945	38,614	47,477		44,368	27,618	103,851	892	-993	44,368	62,935	3,789	47,477	56,906	-868	3,188,921
[41]	14.8	10,367	103,850			1,232	4,363	108,875	62	-308	1,232	21,203	1,205		21,341	-110	382,341
Damour	186.2	139,556	0	84,472	-	66,285	44,590	108,875	5,730	-1,554	66,285	115,207	13,686	84,472	85,360	8,069	6,344,904
[42]	58.5	44,112	5,554	5,554		6,307	15,075	26,523	245	-483	6,307	7,684	856	5,554	8,053	-273	1,098,729
[43]	138.6	104,509	26,523	6,274		15,551	35,500	88,134	1,068	-966	15,551	44,714	2,589	6,274	53,582	-2,170	2,753,111
[44]	71.9	54,162	88,134	25,527	54,508	63,199	28,225	133,145	243	-2,481	63,199	107,650	439	25,527	147,827	-2,844	1,354,882
[45]	65.5	45,898	133,146	83,553		11,382	17,633	213,739	1,101	-1,267	11,382	121,873	5,782	83,553	64,084	-365	1,007,074
Awali	334.5	248,681	0	100,906	54,508	96,448	96,432	213,739	2,676	-6,197	96,448	105,784	9,487	100,906	97,590	-5,752	6,211,776
[46]	58.5	44,112		1,844		27,040	14,187	6,031	31	-313	27,040		1,081	1,844	31,932	-7,818	2,175,864
[47]	90.7	63,578	6,031			36,913	22,788	9,543	148	-782	36,913	2,328	4,847		38,437	-4,046	2,153,899
[48]	12.7	8,893	9,543			4,996	3,557	9,903	128	-149	4,996	8,244	7,692		5,680	-132	320,482
Saintaniq	161.9	116,582	0	1,844	-	68,948	40,512	9,903	307	-1,244	68,948	1,882	13,620	1,844	87,360	-11,995	4,650,232
[49]	54.5	41,054	7,348	7,348		26,448	12,884	9,176	207	-315	26,448	11,518	528	7,348	34,559	-4,487	1,732,956
[50]	35.1	24,833	9,175			15,223	9,387	9,493	128	-420	15,223	29,338	696		45,398	-1,533	802,798
[51]	14.5	10,144	9,493			6,448	3,782	9,539	70	-181	6,448	42,474	2,456		48,842	-477	494,347
Zahrani	104.1	75,031	0	7,348	-	48,119	28,032	9,539	403	-816	48,118	11,019	3,880	7,348	54,588	-10,853	3,030,097
[52]	92.6	64,914		1,107		36,580	27,169	1,112	493	-1,332	36,580		1,986	1,107	37,884	-2,408	2,603,765
[53]	67.5	47,366	1,112			24,808	20,247	3,369	382	-330	24,808	26,752	13,034		39,220	-693	6,826,764
A Assoued	160.1	112,279	0	1,107	-	63,388	47,416	3,369	875	-1,662	63,388	876	15,030	1,107	51,229	6,469	9,430,529
[54]	155.0	118,900				77,201	38,431	778	384	6	77,201		1,233		97,792	-21,824	9,375,085
[55]	119.5	90,042				62,556	26,356	20	1,076	37	62,556		3,331		78,195	-18,941	7,271,263
[56]	343.8	259,140	778			118,855	103,218	34,240	3,848	-244	118,855	90,841	11,056		235,814	-37,174	19,972,670
[57]	130.7	98,545	20			36,833	41,087	20,810	1,291	-1,255	36,833	3,671	7,272		36,587	-3,556	4,896,803
[58]	362.0	272,891	55,050			199,505	105,869	22,261	1,510	-1,203	199,505	220,193	78,903		375,528	-34,733	14,055,960
[59]	130.7	98,545		66,412		122,725	32,891	2,287	7,429	-174	122,725	2,428	11,524	66,412	64,578	-17,359	5,370,888
[60]	543.0	409,333	24,548	19,397		129,645	159,657	105,227	60,566	-1,815	129,645	376,518	74,620	19,397	468,114	-56,988	11,701,980
[61]	53.9	40,614	105,226			27,385	13,052	105,894	118	-407	27,385	433,523	1,353		467,718	-8,183	1,878,376
[62]	148.0	103,798				58,044	45,484	667	139	-1,536	58,044		163		66,175	-7,284	4,660,914
[63]	191.4	134,233	106,360			76,464	58,886	106,847	437	-3,041	76,464	484,806	2,168		574,917	-15,815	5,354,189
[64]	53.2	37,330	106,847			21,734	15,655	107,612	198	-924	21,734	574,088	5,620		590,409	-206	1,079,169
Litani ALL	2,231.3	1,661,272	0	85,809	-	931,746	641,287	107,612	76,995	-10,558	931,746	858	197,244	85,811	870,582	-221,032	85,618,320
[65]	259.0	195,224				102,209	62,849	29,492	633	41	102,209	7,151	2,199		138,651	-31,491	15,323,600
[66]	266.4	215,913	6,683		6,683	127,636	87,821	18,754	1,568	6,717	127,636	1,370	8,376		157,442	-36,812	9,643,618
[67]	381.5	287,580	29,492			165,697	96,316	57,353	37	-2,330	165,697	175,910	6,640		384,761	-48,794	20,498,480
[68]	197.5	148,841	18,754			87,313	49,825	31,484	98	-1,123	87,313	117,014	19,509		207,255	-22,438	6,271,972
[69]	724.4	546,059	88,837	73,595		200,846	188,555	306,781	13,471	-982	200,846	582,016	83,567	73,595	691,941	-28,440	18,458,170
Assi	1,848.8	1,393,618	0	73,595	6,683	683,501	465,464	306,781	15,608	2,343	683,504	58,898	119,292	73,595	715,287	-57,737	70,195,820
[70]	70.8	53,370				19,801	20,439	12,872	282	-3	19,801		146		26,577	-5,921	4,956,420
[71]	221.2	166,753	12,872	1,851		89,545	59,332	33,759	101	-1,462	89,545	25,577	471	1,851	137,443	-24,443	7,842,026
[72]	221.9	167,294	33,759			74,136	59,339	67,504	389	-315	74,136	126,093	1,961		224,005	-25,737	8,122,497
[73]	73.5	55,371	67,504	4,206		20,590	20,866	65,768	190	-130	20,590	224,005	4,006	4,206	242,303	-5,920	2,187,297
Hasbani	587.4	442,788	0	5,857	-	204,071	159,775	65,768	843	-1,910	204,071	34,156	6,564	5,857	287,808	-62,021	23,107,260
Rivers	8,099.5	6,054,516	0	1,079,008	61,191	3,078,433	2,131,666	1,899,849	122,433	-37,662	3,078,436	896,998	511,618	1,079,008	2,983,379	-600,148	274,499,941

Annex 4-3

Annex 4.

2003/11/30

	Area	Surface Water Balance									Groundwater Balance						VoLume
		In				Out				Balance	In		Out			Balance	
Basin	Km2	Rain	RunIn	Spring	Inlet	Recharge	Evap	RunOff	Intake		Recharge	Ginflow	ExistWith	SprUp	GOutflow		
Basin	Area	Rain	RunIn	Spring	Inlet	Recharge	Evap	RunOff	Intake	SurfBal	Recharge	Ginflow	ExistWith	SprUp	GOutflow	SubBal	VoLume
[74]	5.9	4,488				2,132	1,550	845	6	-45	2,132	1,605	24		3,771	-58	177,885
[75]	46.3	34,963	945			15,252	12,470	5,143	89	-156	15,252	1,234	15,127		1,533	-174	1,857,843
Oliant	52.3	39,450	0	0	-	17,384	14,019	6,143	104	-200	17,384	1,759	15,151	0	4,224	-232	2,035,527
[76]	14.4	10,854				5,132	3,762	2,052	18	-110	5,132	3,828	58		9,442	-538	523,987
[77]	26.9	20,338	2,052			9,757	7,079	5,729	33	-209	9,757	9,659	1,109		18,779	-471	830,287
[78]	9.6	7,269	5,729			3,497	2,535	7,030	11	-75	3,497	14,194	3,190		14,577	-77	146,242
Abda	51.0	38,461	0	0	-	18,386	13,376	7,030	62	-393	18,386	4,819	4,355	0	19,936	-1,086	1,600,514
[79]	34.0	25,679				13,658	8,900	3,329	54	-262	13,658		156		14,053	-551	621,986
[80]	18.1	13,645	3,329			4,765	5,432	6,811	102	-136	4,765	6,187	6,702		4,338	-89	273,256
Minie	52.1	39,324	0	0	-	18,423	14,332	6,811	155	-398	18,423	6,187	6,859	0	12,204	-638	895,241
[81]	14.1	10,603				6,072	2,672	1,677	24	-41	6,072	1,790	156		9,267	-1,563	457,968
[82]	42.8	32,282	1,677			18,559	8,771	6,694	63	-129	18,559	210	363		23,256	-4,849	1,390,700
[83]	184.1	138,948	6,694	11,912		55,331	55,559	46,192	2,238	-1,765	55,331	15,163	1,491	11,912	58,480	-1,369	3,033,803
Chekka	241.0	181,834	0	11,912	-	79,962	67,203	46,192	2,325	-1,836	79,962	4,025	2,012	11,912	78,445	-7,782	4,882,472
[84]	53.6	40,434				22,042	12,559	6,032	40	-239	22,042	4,383	3,995		28,326	-5,914	992,774
[85]	85.0	64,055	6,032			34,948	19,898	15,541	78	-379	34,948	21,038	479		63,429	-7,921	1,350,230
[86]	121.3	85,023	15,541			33,490	34,786	33,342	133	-1,186	33,490	64,310	1,949		98,845	-795	930,369
Batrouan	259.9	189,512	0	0	-	90,480	67,244	33,342	252	-1,805	90,479	14,381	6,423	0	113,069	-14,031	3,273,373
[87]	50.9	35,687				17,229	12,875	5,903	86	-406	17,229	88,745	256		114,695	-977	818,611
[88]	46.4	32,523	5,903			19,091	12,234	7,493	49	-441	19,091	131,273	1,478		149,392	-506	716,305
Jounie	97.3	68,210	0	0	-	36,319	25,109	7,493	135	-847	36,319	113,324	1,734	0	149,392	-1,483	1,532,915
[89]	47.5	33,275				18,183	12,263	3,090	123	-383	18,183	991	643		19,952	-1,421	1,406,702
[90]	62.3	43,651	3,090			23,930	17,345	5,869	145	-648	23,930	7,835	2,669		32,211	-3,115	2,017,766
[91]	55.2	38,706	5,869			20,851	15,387	8,273	587	-532	20,851	12,751	525		33,857	-580	2,506,057
Aaramoun	164.9	115,535	0	0	-	62,964	44,996	8,273	885	-1,483	62,964	991	3,837	0	65,235	-5,116	5,930,527
[92]	93.1	65,271				15,414	24,313	26,139	130	-726	15,414	1,465	1,238		16,155	-513	1,428,140
Barja	93.1	65,271	0	0	-	15,414	24,313	26,139	130	-726	15,414	1,465	1,238	0	16,155	-513	1,428,140
[93]	67.5	47,348				28,777	17,818	1,184	136	-686	28,777	14,313	933		44,681	-2,524	1,654,001
[94]	63.1	44,227	1,184			18,787	17,811	8,899	110	-306	18,787	45,524	13,876		51,200	-755	1,018,757
Sarafand	130.6	91,575	0	0	-	47,574	35,729	8,899	248	-873	47,574	15,156	14,808	0	51,200	-3,278	2,572,799
[95]	132.9	93,184				50,712	40,774	2,826	249	-1,379	50,712	4,355	258		63,262	-8,451	3,728,175
[96]	156.0	109,377	2,826			65,182	45,122	3,214	286	-1,580	65,182	64,316	4,104		139,092	-13,717	6,780,799
[97]	259.7	182,114	3,214	46,095		102,254	77,471	43,260	9,750	-1,313	102,254	139,092	31,882	46,095	165,518	-2,249	6,785,461
Sour	548.6	384,675	0	46,095	-	218,128	183,367	43,260	10,286	-4,272	218,128	5,410	36,342	46,095	165,518	-24,418	17,274,460
[98]	200.2	150,874				99,062	46,038	6,683	225	-1,134	99,062	61,465	6,300		180,815	-26,588	8,353,079
Yammoune	200.2	150,874	0	0	-	99,062	46,038	6,683	225	-1,134	99,062	61,465	6,300	0	180,815	-26,588	8,353,079
[99]	85.8	64,701		85,020		38,687	20,907	90,956	47	-876	38,687	45,505	211		85,020	-1,038	4,089,243
Kfer Kouk	85.8	64,701	0	85,020	-	38,687	20,907	90,956	47	-876	38,687	45,505	211	85,020	0	-1,038	4,089,243
Non River	1,978.7	1,429,522	0	143,027	0	742,782	536,633	293,221	14,834	-14,923	742,782	275,088	99,267	143,027	856,193	-86,902	53,769,840
TOTAL	10,076	7,484,038	0	1,222,033	91,191	3,821,215	2,668,289	2,193,069	137,267	-52,578	3,821,219	1,172,086	810,884	1,222,035	3,839,572	-585,950	328,269,781

Annex 4.2 Water Balance at Each Basin under Natural Condition

(Unit: 1,000 m3)

Basin	Area km2	Surfece Water Balance									Groundwater Balance						Volume
		In				Out				Balance	In			Out		SubBal	
		Rain	RunIn	Inlet	Spring	Recharge	Evap	Intake	RunOff		Recharge	GInflow	Exitwith	SprUp	GOutflow		
[1]	15.1	11,369			2,598	7,927	3,080		3,174	-214	7,927			2,598	5,623	-294	858,847
[2]	70.6	53,223	3,174		8,582	37,014	14,223		12,413	-671	37,014	1,052		8,582	39,552	-8,088	3,517,215
[3]	112.8	84,992	12,413			53,824	28,317		16,387	-1,123	53,824	5,614			73,962	-14,524	3,938,411
[4]	100.9	76,130	16,387			15,017	33,951		43,906	-357	15,017	57,283			73,055	-754	1,873,488
[5]	34.2	25,807	43,906			5,130	11,443		53,240	-101	5,130	57,872			63,083	-81	873,743
Kebir	333.5	251,520	0	-	9,180	118,912	91,014	-	53,240	-2,467	118,912	0	-	9,180	133,454	-23,721	11,061,705
[6]	46.2	34,803			3,553	15,580	9,894		13,082	-200	15,580	33,486		3,553	46,835	-3,321	1,833,278
[7]	24.8	18,705	13,082		9,509	8,106	7,067		26,422	-299	8,106	48,052		9,509	44,982	-332	498,859
[8]	68.9	51,973	26,423			12,817	20,341		45,532	-294	12,817	62,913			76,013	-283	1,201,844
[9]	29.8	22,481	45,532			9,468	8,846		49,978	-82	9,468	77,299			86,880	-114	457,220
Ostuene	169.6	127,982	0	-	13,062	45,970	45,950	-	49,978	-875	45,970	69,548	-	13,062	106,507	-4,050	3,991,001
[10]	49.5	37,341			1,357	19,679	10,106		9,125	-213	19,679	16,582		1,357	38,362	-3,457	1,220,698
[11]	54.0	40,786	9,125		12,081	13,858	14,836		34,207	-709	13,858	38,315		12,081	40,717	-626	1,139,844
[12]	15.0	11,343	34,207			5,467	4,025		36,264	-208	5,467	40,552			46,284	-265	402,485
[13]	14.5	10,959	36,264			5,300	3,878		38,269	-224	5,300	43,951			49,356	-106	221,808
Akkar	133.1	100,429	0	-	13,438	44,304	32,646	-	38,269	-1,353	44,304	17,617	-	13,438	52,938	-4,454	2,984,815
[14]	103.8	78,226			18,752	48,787	21,973		26,754	-535	48,787	35,181		18,752	70,306	-5,091	4,055,736
[15]	108.2	81,537	26,754		119,735	43,635	23,753		161,097	-456	43,635	75,347		119,735	252	-1,005	2,642,547
[16]	40.5	30,534	161,095			17,729	8,881		165,348	-329	17,729				21,649	-3,921	994,201
[17]	13.9	10,484	165,349			4,054	4,739		167,123	-104	4,054	22,215			26,307	-37	210,026
Bared	266.3	200,781	0	-	138,487	114,204	59,346	-	167,123	-1,425	114,204	49,859	-	138,487	35,631	-10,054	7,902,510
[18]	157.6	118,763			22,274	53,429	33,642		54,687	-721	53,429			22,274	34,785	-3,631	7,453,435
[19]	37.6	28,310	54,687		16,439	14,827	8,129		76,679	-199	14,827	4,093		16,439	2,671	-189	892,293
[20]	96.4	72,688			114,884	33,351	20,641		133,998	-416	33,351	86,478		114,884	5,348	-404	2,060,762
[21]	80.6	60,743	210,678			39,181	16,550		216,429	-722	39,181	16,742			64,054	-8,150	2,236,049
[22]	112.8	85,123	216,429			46,845	30,162		226,098	-1,354	46,845	67,331			116,042	-2,066	2,303,242
Abou Ali	484.9	365,627	0	-	153,598	187,412	109,125	-	226,098	-3,412	187,412	82,441	-	153,598	130,696	-14,440	14,945,781
[23]	44.2	33,303				19,257	9,932		4,390	-277	19,257				24,053	-4,796	1,585,004
[24]	35.7	26,876	4,390			14,619	8,428		8,468	-248	14,619	220			18,699	-3,860	1,245,314
[25]	57.3	43,209	8,468		11,468	23,579	13,577		26,415	-428	23,579	19,498		11,468	33,812	-2,203	1,888,477
[26]	49.2	34,474	26,415			12,420	14,055		35,100	-687	12,420	26,843			40,185	-921	953,682
Jouz	186.3	137,882	0	-	11,468	69,876	45,991	-	35,100	-1,838	69,876	6,938	-	11,468	77,126	-11,780	5,472,477
[27]	189.7	142,984			258,754	86,588	45,523		270,987	-1,358	86,588	177,962		258,754	7,055	-1,259	3,198,321
[28]	64.7	48,788	270,987		42,270	23,008	17,356		322,186	-494	23,008	19,191		42,270	349	-419	1,338,337
[29]	58.6	44,141	322,185			25,164	14,755		326,937	-530	25,164	18,386			47,082	-5,552	1,173,016
[30]	33.7	23,609	326,937			14,926	9,345		326,882	-609	14,926	2,009			17,957	-1,022	604,693
Ibrahim	346.7	269,532	0	-	301,024	149,887	86,978	-	326,882	-2,991	149,887	209,013	-	301,024	65,928	-8,252	6,314,367
[31]	62.1	46,814			8,959	23,616	14,544		16,057	-444	23,616	19,117		8,959	39,282	-3,488	1,592,945
[32]	128.7	97,000	16,057		9,082	27,125	31,894		64,120	-1,000	27,125	117,758		9,082	141,643	-5,842	3,123,572
[33]	64.1	48,352	64,120		101,456	18,880	16,617		178,751	-318	18,880	148,551		101,456	68,544	-569	986,976
Keib	254.9	192,166	0	-	117,496	69,621	63,056	-	178,751	-1,762	69,621	126,237	-	117,496	88,259	-9,898	5,803,493
[34]	143.6	108,210			3,195	56,868	34,319		19,134	-917	56,868	20,078		3,195	92,244	-16,493	5,020,325
[35]	61.3	46,239	19,134		9,294	26,483	14,897		31,736	-449	26,483	2,497		9,294	25,072	-3,386	1,801,580
[36]	65.0	45,556	31,736		21,810	26,816	17,579		55,706	-1,000	26,816	23,757		21,810	29,366	-603	830,168
[37]	40.0	28,048	55,706		37	4,022	11,567		68,866	-863	4,022	11,389		37	15,432	-58	513,277
Beirut	309.9	228,052	0	-	34,336	118,189	78,362	-	68,866	-3,029	118,189	21,433	-	34,336	125,826	-20,540	8,165,350

	Area	Surfece Water Balance									Groundwater Balance							Volume
		In				Out				Balance	In			Out			SubBal	
Basin	km2	Rain	RunIn	Inlet	Spring	Recharge	Evap	Intake	RunOff		Recharge	GInflow	Exitwith	SprUp	GOutflow			
[38]	27.6	20,810				10,648	8,407		3,912	-157	10,648	55,988			67,126	-489	863,857	
[39]	24.5	18,434	3,911		50,978	10,402	6,483		56,720	-282	10,402	66,617		50,978	26,533	-491	1,916,565	
[40]	119.3	89,945	56,720		51,162	44,467	27,841		126,459	-838	44,467	63,861		51,162	57,998	-832	3,189,923	
[41]	14.8	10,367	126,458			1,299	4,367		131,413	-253	1,299	22,571			23,974	-105	383,738	
Damour	186.2	139,555	0	-	102,140	66,816	45,097	-	131,413	-1,830	66,816	122,779	-	102,140	89,372	-1,918	6,354,083	
[42]	58.5	44,112			7,347	6,315	15,108		30,558	-522	6,315	8,756		7,347	7,904	-179	1,097,384	
[43]	138.6	104,509	30,558		7,862	15,611	36,024		92,631	-1,337	15,611	44,985		7,862	54,223	-1,488	2,756,699	
[44]	71.9	54,162	92,630		3,996	29,170	17,053		105,047	-482	29,170	113,106		3,996	140,647	-2,368	1,348,209	
[45]	65.5	45,898	105,047		63,964	11,338	17,712		186,910	-1,048	11,338	116,650		63,964	64,371	-347	1,007,302	
Awali	334.5	248,881	0	-	83,169	62,434	85,897	-	186,910	-3,389	62,434	114,541	-	83,169	98,187	-4,381	6,209,584	
[46]	58.5	44,112			2,853	27,041	14,234		5,868	-378	27,041			2,853	31,729	-7,342	2,179,823	
[47]	90.7	63,578	5,869			36,916	22,964		10,514	-948	36,916	1,999			42,702	-3,787	2,183,295	
[48]	12.7	8,893	10,514			4,998	3,589		10,993	-173	4,998	8,536			13,668	-130	323,136	
Saintaniq	161.9	116,582	0	-	2,653	68,955	40,787	-	10,993	-1,499	68,955	1,933	-	2,653	79,493	-11,259	4,686,054	
[49]	54.5	41,054			8,496	26,455	12,996		10,503	-404	26,455	12,402		8,496	33,780	-3,419	1,737,217	
[50]	35.1	24,833	10,503		451	15,238	9,473		11,359	-484	15,238	28,499		451	44,615	-1,329	812,968	
[51]	14.5	10,144	11,359			6,459	3,813		11,462	-231	6,459	43,678			50,565	-428	499,360	
Zahrani	104.1	75,831	0	-	8,947	48,152	26,282	-	11,462	-1,119	48,152	11,919	-	8,947	56,300	-5,178	3,048,544	
[52]	92.6	64,914			5,865	38,867	28,821		5,739	-2,648	38,867	5,865		5,865	35,302	3,566	2,614,564	
[53]	67.5	47,365	5,739			24,845	20,330		8,259	-331	24,845	27,143			52,672	-685	4,796,237	
A Assoaud	160.1	112,279	0	-	5,865	63,712	48,951	-	8,259	-2,979	63,712	1,052	-	5,865	61,883	2,881	7,410,801	
[54]	155.0	116,800				77,390	38,622		781	7	77,390				97,485	-20,095	9,405,942	
[55]	119.5	90,042				63,070	26,914		21	37	63,070				77,204	-14,135	7,663,917	
[56]	343.8	259,140	781			105,447	106,145		49,068	-2,740	105,447	94,254			224,536	-24,834	20,018,550	
[57]	130.7	98,545	21			26,324	43,810		29,664	-1,232	26,324	8,424			34,180	-1,431	4,909,738	
[58]	362.0	272,891	78,732		15,158	216,790	108,327		42,986	-1,321	216,790	207,821		15,158	437,271	-27,818	7249091	
[59]	130.7	98,545			458,467	514,065	33,428		10,285	-766	514,065	2,268		458,467	73,910	-16,043	5,520,036	
[60]	543.0	409,333	53,270		103,230	135,346	164,838		267,720	-2,073	135,346	438,485		103,230	498,841	-28,240	11,897,280	
[61]	53.9	40,614	267,721		337	27,813	13,260		267,998	-398	27,813	456,694		337	488,572	-4,403	1904976	
[62]	148.0	103,798	7,722			59,053	46,103		8,472	-2,108	59,053	7,722			54,375	12,400	4,779,441	
[63]	191.4	134,233	276,470			70,224	63,753		280,303	-3,577	70,224	503,199			584,128	-10,703	5,399,497	
[64]	53.2	37,330	280,303			21,885	15,752		280,971	-974	21,885	583,368			605,435	-182	1,079,482	
Litani ALL	2,231.3	1,661,272	0	-	577,192	1,317,408	662,952	-	280,971	-15,147	1,317,408	428	-	577,192	883,847	-2,897	13,163,398	
[65]	259.0	195,224				102,465	63,173		29,546	41	102,465	3,231			135,612	-28,916	15,569,320	
[66]	286.4	215,913	15,654			128,291	68,762		18,627	15,686	128,291	1,596			167,302	-37,415	9,828,722	
[67]	381.5	287,580	29,546			165,728	98,658		57,403	-2,663	165,728	172,856			384,445	-45,881	20,541,370	
[68]	197.5	148,841	18,827		9,984	87,376	50,491		41,560	-1,776	87,376	125,808		9,984	224,183	-20,984	6,375,174	
[69]	724.4	546,059	98,962		143,088	202,255	190,024		396,868	-1,036	202,255	808,628		143,088	677,365	-9,570	18,547,390	
Assi	1,848.8	1,393,618	0	-	153,074	686,114	469,107	-	396,868	10,253	686,114	53,906	-	153,072	730,693	-143,746	70,861,976	
[70]	70.8	53,370				19,889	20,566		12,918	-3	19,889				25,731	-5,842	4,962,174	
[71]	221.2	166,753	12,918		1,776	88,532	59,602		35,084	-1,771	88,532	25,731		1,776	136,408	-23,920	7845622	
[72]	221.9	167,294	35,084			74,189	59,389		69,113	-314	74,189	132,406			229,851	-23,058	8,178,629	
[73]	73.5	55,371	69,113		9,529	20,613	20,884		92,895	-178	20,613	229,851		9,529	245,281	-4,546	2,197,349	
Hasbani	587.4	442,788	0	-	11,305	203,224	160,240	-	92,895	-2,266	203,224	41,672	-	11,305	290,955	-57,364	23,183,774	
Rivers	8,099.5	6,054,516	0	-	1,736,233	3,434,990	2,161,781	-	2,264,079	-36,727	3,434,990	931,316	-	1,736,231	3,107,096	-331,040	201,560,711	

Annex 4-2(3)

	Area	Surface Water Balance									Groundwater Balance						Volume
		In				Out				Balance	In		Out			SubBal	
Basin	km2	Rain	Runin	Inlet	Spring	Recharge	Evap	Intake	RunOff		Recharge	Glnflow	Exitwith	SprUp	GOutflow		
[74]	5.9	4,488				2,132	1,560		850	-54	2,132	1,548			3,735	-55	178,948
[75]	46.3	34,963	850			15,256	12,480		8,232	-156	15,256	839			16,268	-174	1,904,544
Oliant	52.3	39,450	0	-	0	17,388	14,039	-	8,232	-209	17,388	1,401	-	0	19,018	-229	2,083,492
[76]	14.4	10,854				5,133	3,790		2,066	-135	5,133	4,580			10,234	-522	533,219
[77]	26.9	20,338	2,066			9,758	7,125		5,772	-251	9,758	9,985			20,175	-433	842,480
[78]	9.6	7,269	5,772			3,497	2,556		7,094	-105	3,497	15,149			18,723	-77	146,457
Abda	51.0	38,461	0	-	0	18,387	13,471	-	7,094	-491	18,387	5,414	-	0	24,632	-1,032	1,522,156
[79]	34.0	25,679				13,659	8,958		3,381	-318	13,659				14,208	-549	625,489
[80]	18.1	13,645	3,381			4,765	5,490		6,962	-191	4,765	6,088			10,943	-89	275,985
Minle	52.1	39,324	0	-	0	18,424	14,448	-	6,962	-509	18,424	0	-	0	19,082	-638	901,473
[81]	14.1	10,603				6,072	2,885		1,699	-53	6,072	1,974			9,589	-1,543	460,470
[82]	42.8	32,282	1,699			18,560	8,816		6,776	-171	18,560	326			23,660	-4,774	1,396,423
[83]	184.1	138,948	6,776		13,458	55,377	55,884		49,992	-2,050	55,377	15,384		13,458	58,788	-1,485	3,035,696
Chekka	241.0	181,834	0	-	13,458	80,009	67,565	-	49,992	-2,274	80,009	4,867	-	13,458	79,221	-7,802	4,892,589
[84]	53.6	40,434				22,042	12,620		6,069	-297	22,042	4,165			32,055	-5,848	1,019,410
[85]	85.0	64,055	6,069			34,949	20,005		15,649	-479	34,949	23,007			65,803	-7,847	1,383,455
[86]	121.3	85,023	15,649			33,491	34,979		33,576	-1,375	33,491	66,675			100,963	-797	931,075
Batrouan	259.9	189,512	0	-	0	90,482	67,604	-	33,576	-2,151	90,482	13,995	-	0	118,968	-14,492	3,313,940
[87]	50.9	35,887				17,230	12,986		5,983	-512	17,230	98,621			116,819	-969	817,762
[88]	46.4	32,523	5,983			19,091	12,335		7,820	-540	19,091	134,147			153,743	-504	716,820
Jounie	97.3	68,210	0	-	0	36,321	25,321	-	7,820	-1,052	36,321	115,949	-	0	153,743	-1,473	1,534,582
[89]	47.5	33,275			211	18,185	12,358		3,417	-473	18,185	967		211	20,208	-1,265	1,411,151
[90]	62.3	43,651	3,417			23,931	17,477		6,338	-677	23,931	7,702			34,567	-2,935	2,049,007
[91]	55.2	38,708	6,337			20,852	15,529		9,336	-671	20,852	13,614			35,044	-577	2,506,973
Aaramoun	164.9	115,635	0	-	211	62,968	45,364	-	9,336	-1,821	62,968	967	-	211	68,500	-4,777	5,967,131
[92]	93.1	65,271				15,415	24,500		26,263	-907	15,415	1,936			17,843	-493	1,429,711
Barja	93.1	65,271	0	-	0	15,415	24,500	-	26,263	-907	15,415	1,936	-	0	17,843	-493	1,429,711
[93]	67.5	47,348				28,777	18,034		1,289	-752	28,777	10,056			41,383	-2,530	1,630,695
[94]	63.1	44,227	1,289			18,799	17,922		9,102	-308	18,799	42,153			61,671	-719	1,033,752
Sarafand	130.6	91,575	0	-	0	47,576	35,956	-	9,102	-1,058	47,576	10,847	-	0	61,671	-3,248	2,664,447
[95]	132.9	93,184				50,729	42,024		2,996	-2,565	50,729	4,780			63,395	-7,886	3,799,130
[96]	156.0	109,377	2,996			65,177	46,838		3,619	-3,260	65,177	64,475			142,255	-12,602	6,827,462
[97]	259.7	182,114	3,619		73,082	102,643	77,696		79,776	-1,300	102,643	142,255		73,082	173,294	-1,478	6,779,440
Sour	548.6	384,675	0	-	73,082	218,549	166,557	-	79,776	-7,125	218,549	5,860	-	73,082	173,294	-21,986	17,406,032
[98]	200.2	150,874			9,478	99,629	47,828		15,654	-2,760	99,629	57,574		9,478	175,608	-27,883	8,585,854
Yammoune	200.2	150,874	0	-	9,478	99,629	47,828	-	15,654	-2,760	99,629	57,574	-	9,478	175,608	-27,883	8,585,854
[99]	85.8	64,701			85,393	38,688	20,907		91,375	-876	38,688	45,874		85,393		-1,031	4,089,341
Kfar Kouk	85.8	64,701	0	-	85,393	38,688	20,907	-	91,375	-876	38,688	45,874	-	85,393	0	-1,031	4,089,341
Non River	1,976.7	1,429,522	0	-	181,623	743,836	543,592	-	344,981	-21,233	743,836	264,483	-	181,623	911,760	-85,084	54,390,748
TOTAL	10,078.2	7,484,038	0	-	1,917,856	4,178,826	2,695,343	-	2,609,060	-57,980	4,178,826	1,195,799	-	1,917,854	4,018,856	-416,103	255,951,459

Annex 4.3 CURRENT YEARLY WATER BALANCE (for 17 River basins)

(Unit: 1,000 m3)

Kebir [1-5] — Area= 333.487 km2

Year	Rain	Inlet	Spring	Recharge	Evap	RunOff	Outlet	SurfBal	Recharge	GInflow	ExsPmpUp	SprUp	GOutflow	SubBal	Volume(Strage)
1992	377,326	0	0	192,290	107,937	80,661	738	-4,299	192,290	0	20,959	0	116,387	54,943	11,011,500
1993	295,099	0	0	154,500	104,258	41,824	664	-6,147	154,500	0	20,921	0	116,750	16,830	11,019,100
1994	324,418	0	0	125,900	109,743	67,654	504	20,616	125,900	0	20,921	0	116,383	-11,402	10,998,400
1995	275,757	0	0	156,110	100,731	44,573	584	-26,244	156,110	0	20,921	0	116,678	18,615	11,007,700
1996	285,515	0	381	136,300	103,809	41,269	612	3,908	136,300	0	20,959	381	117,706	-2,748	10,996,800
1997	187,567	0	0	89,738	77,002	22,432	405	-2,010	89,738	0	20,921	0	117,180	-48,363	10,938,200
1998	180,885	0	0	76,314	67,408	30,224	340	6,800	76,314	0	20,921	0	115,075	-59,682	10,869,300
1999	123,406	0	0	51,553	69,875	11,278	293	-9,594	51,553	0	20,921	0	111,888	-81,256	10,778,800
2000	280,907	0	0	131,580	92,534	57,691	458	-1,256	131,580	0	20,959	0	110,290	330	10,770,000
2001	184,319	0	0	73,223	70,200	40,353	327	216	73,223	0	20,921	0	108,531	-56,229	10,704,500
Average	**251,820**	**0**	**38**	**118,751**	**90,350**	**43,786**	**492**	**-1,821**	**118,751**	**0**	**20,932**	**38**	**114,687**	**-16,908**	**10,909,330**

Ostuene [6-9] — Area= 169.603 km2

Year	Rain	Inlet	Spring	Recharge	Evap	RunOff	Outlet	SurfBal	Recharge	GInflow	ExsPmpUp	SprUp	GOutflow	SubBal	Volume(Strage)
1992	183,485	0	15,920	69,844	52,115	79,459	2,185	-4,178	69,844	66,464	30,555	15,920	96,423	-6,590	3,963,800
1993	133,083	0	13,282	52,032	43,870	50,530	2,126	-2,192	52,032	67,297	30,490	13,282	93,671	-18,114	3,960,950
1994	177,552	0	11,787	57,963	56,506	62,762	1,989	10,138	57,963	67,328	30,490	11,787	93,020	-10,006	3,966,210
1995	117,578	0	12,499	43,773	44,844	51,443	1,979	-11,961	43,773	67,762	30,490	12,499	91,577	-23,032	3,958,450
1996	143,977	0	11,952	51,826	52,934	46,630	1,982	2,556	51,826	68,038	30,555	11,952	92,255	-14,897	3,958,870
1997	101,871	0	10,305	36,374	45,206	26,873	1,911	-189	36,374	67,312	30,490	10,305	90,885	-27,795	3,946,350
1998	104,932	0	8,364	34,960	41,871	31,636	1,825	3,003	34,960	65,808	30,490	8,364	89,287	-27,372	3,934,240
1999	63,425	0	6,069	22,428	35,758	15,075	1,601	-5,367	22,428	63,963	30,490	6,069	86,274	-36,441	3,913,070
2000	145,051	0	8,929	51,335	46,061	53,485	1,540	-441	51,335	63,000	30,555	8,929	88,228	-11,377	3,917,010
2001	108,665	0	6,205	38,957	38,019	38,402	1,263	229	38,957	60,951	30,490	6,205	87,751	-26,638	3,905,740
Average	**127,962**	**0**	**10,331**	**45,749**	**45,716**	**45,830**	**1,838**	**-840**	**45,749**	**65,792**	**30,510**	**10,331**	**90,917**	**-20,216**	**3,942,469**

Akkar [10-13] — Area= 133.127 km2

Year	Rain	Inlet	Spring	Recharge	Evap	RunOff	Outlet	SurfBal	Recharge	GInflow	ExsPmpUp	SprUp	GOutflow	SubBal	Volume(Strage)
1992	146,399	0	21,429	70,882	38,016	61,084	313	-2,467	70,882	16,201	18,343	21,429	55,103	-7,792	2,998,330
1993	109,282	0	15,233	51,250	32,589	41,987	359	-1,890	51,250	16,308	18,286	15,233	51,856	-17,817	2,991,510
1994	135,819	0	10,689	56,841	40,478	43,599	375	5,416	56,841	16,350	18,286	10,689	51,556	-7,540	2,994,970
1995	98,892	0	12,470	45,677	33,009	40,232	379	-8,135	45,677	16,401	18,286	12,470	50,541	-19,219	2,986,750
1996	113,359	0	10,838	49,624	37,567	36,828	357	22	49,624	16,456	18,343	10,838	50,615	-13,716	2,984,090
1997	78,132	0	7,161	31,986	30,070	24,274	323	-1,360	31,986	16,368	18,286	7,161	48,550	-25,642	2,968,450
1998	78,711	0	4,328	31,995	26,501	21,291	216	1,035	31,995	16,173	18,286	4,328	47,239	-21,884	2,958,760
1999	49,597	0	1,717	18,749	25,290	10,087	193	-2,985	18,749	15,950	18,286	1,717	45,330	-30,633	2,939,130
2000	113,237	0	1,110	51,577	33,022	31,294	188	-1,734	51,577	15,775	18,343	1,110	47,785	114	2,950,290
2001	81,060	0	2,301	34,395	26,330	22,767	188	-298	34,395	15,465	18,286	2,301	47,012	-17,739	2,943,550
Average	**100,429**	**0**	**8,728**	**44,278**	**32,467**	**33,322**	**289**	**-1,220**	**44,278**	**16,145**	**18,303**	**8,728**	**49,559**	**-16,167**	**2,971,683**

Bared [14-17] — Area= 266.321 km2

Year	Rain	Inlet	Spring	Recharge	Evap	RunOff	Outlet	SurfBal	Recharge	GInflow	ExsPmpUp	SprUp	GOutflow	SubBal	Volume(Strage)
1992	320,277	0	182,070	195,090	75,674	226,660	5,583	-867	195,090	47,410	13,698	182,070	34,025	12,710	7,916,470
1993	273,940	0	151,470	162,840	79,325	160,490	5,751	-2,795	162,840	47,902	13,639	151,470	32,834	12,597	7,914,840
1994	230,791	0	125,960	114,160	79,301	143,970	5,810	13,515	114,160	47,367	13,639	125,960	32,373	-10,445	7,890,180
1995	271,259	0	138,080	158,950	77,067	188,870	5,790	-21,335	158,950	47,499	13,639	138,080	31,997	22,730	7,898,690
1996	230,778	0	130,760	130,820	64,819	159,970	5,753	175	130,820	47,438	13,699	130,760	32,088	1,709	7,886,210
1997	135,202	0	100,640	78,120	32,394	122,390	5,850	-2,920	78,120	46,308	13,639	100,640	30,246	-20,094	7,851,890
1998	115,318	0	70,142	58,022	31,995	83,805	5,697	5,942	58,022	44,300	13,639	70,142	28,414	-9,872	7,827,800
1999	97,056	0	68,467	51,157	45,587	84,291	5,885	-1,196	51,157	42,168	13,639	68,467	26,289	-16,071	7,798,500
2000	219,401	0	91,512	123,550	64,403	123,190	5,906	-6,135	123,550	41,838	13,699	91,512	27,666	32,310	7,816,820
2001	113,587	0	59,246	56,606	42,051	66,903	5,569	1,702	56,606	40,148	13,639	59,246	25,892	-2,021	7,800,380
Average	**200,761**	**0**	**111,835**	**112,912**	**59,262**	**136,054**	**5,739**	**-1,371**	**112,912**	**45,218**	**13,657**	**111,835**	**30,183**	**2,455**	**7,860,158**

Annex 4-3(2)

Abou Ali [18-22]										Area=	484.914 km2				
Year	Rain	Inlet	Spring	Recharge	Evap	RunOff	Outlet	SurfBal	Recharge	GInflow	ExsPmpUp	SprUp	GOutflow	SubBal	Volume(Strage)
1992	567,513	0	242,380	310,960	135,512	384,330	3,834	-4,542	310,960	102,138	20,581	242,380	156,854	-6,719	14,998,600
1993	467,184	0	206,860	244,280	132,332	298,570	4,227	-5,370	244,280	102,475	20,482	206,860	136,822	-17,403	14,983,200
1994	443,577	0	174,740	210,520	144,058	237,030	3,636	23,083	210,520	101,987	20,482	174,740	123,805	-6,325	14,979,000
1995	461,762	0	200,450	239,870	131,007	313,980	3,855	-36,104	239,870	102,128	20,482	200,450	132,601	-11,729	14,969,300
1996	417,913	0	187,290	215,810	121,766	284,250	3,596	-222	215,810	102,368	20,581	187,290	127,196	-16,890	14,954,600
1997	256,219	0	145,650	134,060	72,903	199,030	3,501	-5,622	134,060	100,595	20,482	145,650	118,545	-50,030	14,906,600
1998	234,027	0	109,630	110,880	70,832	149,200	3,466	9,270	110,880	97,353	20,482	109,630	110,359	-32,232	14,876,500
1999	177,954	0	103,620	82,376	83,958	116,810	3,484	-5,054	82,376	93,865	20,482	103,620	103,432	-51,290	14,827,200
2000	403,553	0	133,970	212,600	116,494	214,990	3,585	-10,138	212,600	93,173	20,581	133,970	111,967	39,250	14,888,600
2001	234,568	0	94,177	113,830	81,439	127,980	3,519	2,179	113,830	89,810	20,482	94,177	113,115	-24,536	14,848,200
Average	365,627	0	159,877	187,479	109,030	228,617	3,630	-3,252	187,479	98,569	20,512	159,877	123,450	-17,790	14,920,980

Jouz [23-26]										Area=	186.324 km2				
Year	Rain	Inlet	Spring	Recharge	Evap	RunOff	Outlet	SurfBal	Recharge	GInflow	ExsPmpUp	SprUp	GOutflow	SubBal	Volume(Strage)
1992	211,563	0	25,505	117,780	55,756	85,578	548	-2,594	117,780	7,209	16,315	25,505	78,998	7,171	5,468,820
1993	171,811	0	19,508	89,871	57,255	45,074	562	-1,643	89,871	7,366	16,253	19,508	76,069	-14,592	5,455,660
1994	163,215	0	12,222	72,714	57,952	36,695	506	7,569	72,714	7,334	16,253	12,222	75,343	-23,770	5,453,310
1995	170,352	0	18,282	96,958	53,505	50,157	538	-12,523	96,958	7,293	16,253	18,282	75,544	-5,828	5,458,910
1996	158,584	0	15,294	81,485	50,220	42,331	486	-624	81,485	7,335	16,315	15,294	75,906	-18,715	5,451,690
1997	104,676	0	8,636	53,666	32,227	28,064	329	-973	53,666	7,066	16,253	8,636	75,135	-39,292	5,423,820
1998	89,396	0	384	40,499	30,383	16,005	264	3,628	40,499	6,514	16,253	384	74,685	-44,308	5,390,950
1999	70,804	0	0	28,707	36,815	7,821	341	-2,880	28,707	6,007	16,253	0	73,079	-54,617	5,347,760
2000	150,148	0	0	78,415	47,630	27,018	412	-3,230	78,415	6,564	16,315	0	72,894	-5,128	5,354,120
2001	88,278	0	0	38,440	34,541	14,908	305	83	38,440	5,287	16,253	0	71,503	-44,030	5,321,520
Average	137,882	0	9,983	69,852	45,618	33,265	429	-1,319	69,852	6,708	16,272	9,983	74,616	-24,311	5,413,656

Ibrahim [27-30]										Area=	346.656 km2				
Year	Rain	Inlet	Spring	Recharge	Evap	RunOff	Outlet	SurfBal	Recharge	GInflow	ExsPmpUp	SprUp	GOutflow	SubBal	Volume(Strage)
1992	410,358	0	369,850	251,780	112,276	416,830	1,951	-2,625	251,780	204,357	16,583	369,850	87,823	1,874	6,351,680
1993	348,963	0	338,970	201,030	117,865	370,970	1,953	-5,876	201,030	204,974	16,529	338,970	89,237	-18,738	6,339,810
1994	298,563	0	294,800	149,740	113,098	314,440	1,947	14,138	149,740	204,440	16,529	294,800	87,583	-24,831	6,321,850
1995	345,269	0	337,430	215,090	110,495	382,510	1,967	-27,365	215,090	204,359	16,529	337,430	87,538	-2,046	6,326,680
1996	298,721	0	312,700	172,590	94,863	343,340	1,949	-1,112	172,590	205,069	16,583	312,700	87,457	-19,087	6,314,510
1997	181,323	0	267,280	113,230	50,105	287,420	1,948	-4,102	113,230	202,001	16,529	267,280	65,299	-33,877	6,287,500
1998	152,939	0	225,850	85,492	46,503	236,660	1,946	6,187	85,492	196,018	16,529	225,850	61,275	-22,145	6,272,240
1999	128,160	0	206,770	60,195	67,528	207,700	1,951	-2,444	60,195	189,166	16,529	206,770	56,806	-30,742	6,248,380
2000	282,757	0	280,910	166,310	93,423	310,720	1,955	-8,741	166,310	187,255	16,583	280,910	55,835	239	6,255,520
2001	150,267	0	191,910	77,300	61,589	199,290	1,941	2,060	77,300	180,496	16,529	191,910	51,921	-2,566	6,259,830
Average	259,532	0	282,647	149,276	88,954	306,988	1,951	-2,988	149,276	197,813	16,545	282,647	63,068	-15,192	6,297,798

Kelb [31-33]										Area=	254.937 km2				
Year	Rain	Inlet	Spring	Recharge	Evap	RunOff	Outlet	SurfBal	Recharge	GInflow	ExsPmpUp	SprUp	GOutflow	SubBal	Volume(Strage)
1992	308,958	0	138,370	120,300	81,303	245,040	2,134	-1,446	120,300	124,820	3,397	138,370	88,093	15,259	5,788,140
1993	267,021	0	124,030	100,180	87,013	202,920	2,361	-1,428	100,180	123,680	3,390	124,030	88,223	8,118	5,787,110
1994	217,385	0	112,260	69,086	83,833	161,450	2,005	13,270	69,086	123,179	3,390	112,260	87,865	-11,261	5,768,710
1995	266,052	0	118,680	101,200	82,472	220,600	2,315	-21,882	101,200	122,923	3,390	118,680	88,206	13,853	5,775,410
1996	221,260	0	115,830	80,274	67,927	166,580	2,009	293	80,274	123,931	3,397	115,830	87,812	-2,831	5,766,430
1997	127,896	0	100,110	48,912	31,756	148,160	1,790	-2,908	48,912	121,128	3,390	100,110	87,326	-20,784	5,737,490
1998	106,742	0	91,681	36,953	31,578	122,950	1,670	5,275	36,953	118,492	3,390	91,681	86,028	-25,854	5,704,690
1999	92,721	0	86,329	28,358	49,117	99,798	1,769	-992	28,358	114,284	3,390	85,329	86,087	-32,185	5,666,370
2000	209,405	0	94,791	76,946	66,438	163,160	1,922	-6,275	76,946	114,421	3,397	94,791	86,734	6,446	5,664,670
2001	104,524	0	80,952	32,912	43,521	105,250	1,774	2,023	32,912	111,880	3,390	80,952	84,687	-24,136	5,633,380
Average	192,156	0	106,203	69,512	62,696	165,591	1,975	-1,405	69,512	119,864	3,392	106,203	87,096	-7,315	5,728,840

Beirut [34-37] — Area= 309.867 km2

Year	Rain	Inlet	Spring	Recharge	Evap	RunOff	Outlet	SurfBal	Recharge	Qinflow	ExsPmpUp	SprUp	QOutflow	SubBal	Volume(Strage)
1992	348,119	0	62,063	196,360	94,269	117,820	3,147	-4,416	196,360	18,836	3,986	62,063	127,282	21,863	8,211,770
1993	274,286	0	40,576	147,530	94,261	74,200	2,909	-4,043	147,530	18,830	3,955	40,576	124,309	-2,475	8,204,230
1994	273,482	0	29,985	128,950	98,222	62,907	2,634	10,760	128,950	18,606	3,955	29,985	123,429	-9,810	8,189,350
1995	271,932	0	36,129	154,230	88,848	81,853	2,863	-19,734	154,230	18,612	3,955	36,129	123,435	9,224	8,193,510
1996	262,258	0	37,991	137,550	86,790	74,925	2,795	-1,810	137,550	18,528	3,986	37,991	124,850	-10,749	8,177,710
1997	179,473	0	22,284	91,464	58,979	51,197	2,166	-2,049	91,464	18,331	3,955	22,284	120,860	-37,304	8,135,340
1998	154,042	0	17,190	69,664	54,830	39,900	1,714	5,122	69,664	18,366	3,955	17,190	118,447	-51,561	8,078,710
1999	119,186	0	8,473	52,777	63,213	16,338	1,326	-5,997	52,777	18,150	3,955	8,473	112,847	-54,148	8,019,500
2000	248,332	0	17,354	132,460	80,316	56,880	2,263	-5,236	132,460	18,036	3,986	17,354	113,791	15,368	8,029,820
2001	152,416	0	12,221	70,203	59,594	33,073	1,731	36	70,203	17,893	3,955	12,221	110,865	-38,945	7,986,810
Average	**228,052**	**0**	**26,427**	**118,119**	**77,932**	**60,809**	**2,355**	**-2,738**	**118,119**	**18,409**	**3,964**	**26,427**	**119,991**	**-15,654**	**8,122,576**

Damour [38-41] — Area= 186.171 km2

Year	Rain	Inlet	Spring	Recharge	Evap	RunOff	Outlet	SurfBal	Recharge	Qinflow	ExsPmpUp	SprUp	QOutflow	SubBal	Volume(Strage)
1992	221,338	0	135,320	113,780	56,181	182,530	5,505	-1,312	113,780	118,827	3,588	135,320	84,893	8,780	6,363,040
1993	187,915	0	116,680	91,999	59,597	149,820	5,598	-2,418	91,999	119,321	3,579	116,680	84,810	6,255	6,359,190
1994	180,052	0	95,627	84,634	58,242	118,020	5,482	9,297	84,634	118,475	3,579	95,627	84,763	-859	6,348,230
1995	187,042	0	113,340	99,332	58,386	154,380	5,522	-15,214	99,332	117,930	3,579	113,340	85,052	15,292	6,353,410
1996	180,538	0	104,560	77,849	48,490	133,280	6,024	-447	77,849	118,448	3,588	104,560	85,308	2,843	6,346,150
1997	96,813	0	79,382	48,766	26,132	98,207	5,267	-2,377	48,766	117,027	3,579	79,382	85,033	-2,200	6,333,850
1998	81,372	0	51,151	35,234	25,536	62,083	6,420	3,270	35,234	114,899	3,579	51,151	85,490	9,913	6,333,660
1999	66,624	0	39,787	25,970	35,646	43,276	5,583	-2,063	25,970	110,984	3,579	39,787	86,380	7,208	6,330,770
2000	152,049	0	78,823	74,323	47,932	108,920	6,064	-4,370	74,323	109,450	3,588	78,823	85,491	15,871	6,336,530
2001	79,903	0	30,049	30,984	32,780	40,254	5,840	94	30,984	108,712	3,579	30,049	86,281	17,788	6,344,210
Average	**139,555**	**0**	**84,472**	**66,285**	**44,690**	**108,875**	**5,730**	**-1,554**	**66,285**	**115,207**	**3,582**	**84,472**	**85,350**	**8,089**	**6,344,904**

Awali [42-45] — Area= 334.478 km2

Year	Rain	Inlet	Spring	Recharge	Evap	RunOff	Outlet	SurfBal	Recharge	Qinflow	ExsPmpUp	SprUp	QOutflow	SubBal	Volume(Strage)
1992	386,391	131,870	180,770	180,810	138,063	386,360	3,295	-9,499	180,810	108,177	3,276	180,770	106,052	-1,105	6,243,060
1993	318,985	110,100	149,130	150,570	135,029	300,670	3,385	-11,431	150,570	108,111	3,265	149,130	101,921	2,361	6,239,200
1994	290,983	58,073	114,060	103,890	125,397	219,840	2,965	11,025	103,890	105,687	3,265	114,060	99,606	-7,557	6,225,420
1995	316,981	70,585	119,900	128,020	115,438	290,440	3,071	-29,395	128,020	106,863	3,265	119,900	99,937	11,575	6,230,780
1996	286,131	54,077	113,610	104,830	110,496	240,760	2,995	-5,268	104,830	108,330	3,276	113,610	100,748	-4,468	6,220,100
1997	182,612	32,112	85,979	68,130	58,542	175,370	2,410	-3,749	68,130	106,236	3,265	85,979	97,318	-12,195	6,201,680
1998	155,199	21,993	63,626	50,026	54,411	128,010	2,045	6,330	50,026	108,037	3,265	63,626	98,554	-4,382	6,191,080
1999	126,695	8,157	54,963	32,840	70,598	84,606	2,275	-3,504	32,840	105,394	3,265	54,963	90,113	-10,106	6,174,760
2000	270,878	45,380	72,067	99,922	93,720	200,450	2,590	-8,353	99,922	99,096	3,276	72,067	93,999	30,276	6,198,810
2001	152,957	14,633	54,975	45,449	62,928	110,880	1,732	1,873	45,449	103,508	3,265	54,975	90,448	289	6,192,860
Average	**248,681**	**54,508**	**100,906**	**96,449**	**96,432**	**213,739**	**2,676**	**-5,197**	**96,449**	**105,784**	**3,268**	**100,908**	**97,590**	**467**	**6,211,776**

Saintaniq [46-48] — Area= 161.873 km2

Year	Rainfall	Inlet	Spring	Recharge	Evap. T	RunOff	Intake	SurfBal	Recharge	Qinflow	ExsPmpUp	SprUp	QOutflow	SubBal	VoLume
1992	166,233		9,498	107,920	45,482	25,772	568	-4,014	107,920	1,936	13,629	9,498	72,388	14,344	4,706,290
1993	120,051		4,841	72,146	43,957	10,261	417	-1,890	72,146	1,970	13,616	4,841	70,646	-14,987	4,691,300
1994	147,145		1,659	86,723	46,765	9,506	392	3,418	86,723	1,919	13,616	1,659	68,830	4,537	4,695,840
1995	118,276		1,013	71,896	41,796	12,076	361	-6,838	71,896	1,917	13,616	1,013	69,585	-10,401	4,685,440
1996	133,817		1,434	79,465	46,022	10,308	333	-778	79,465	1,927	13,629	1,434	70,369	-4,040	4,681,400
1997	105,026		0	57,684	37,958	8,343	207	834	57,684	1,899	13,616	0	67,931	-21,994	4,659,430
1998	91,702		0	49,860	33,539	4,813	172	3,318	49,860	1,883	13,616	0	67,863	-29,537	4,629,900
1999	65,260		0	34,969	34,002	1,120	145	-4,976	34,969	1,818	13,616	0	63,582	-40,412	4,589,480
2000	126,865		0	75,539	40,448	11,744	277	-1,144	75,539	1,792	13,629	0	61,938	1,764	4,591,250
2001	91,348		0	53,280	33,153	5,090	198	-372	53,280	1,755	13,616	0	60,872	-19,263	4,571,990
Average	**116,582**	**0**	**1,944**	**68,948**	**40,512**	**9,903**	**307**	**-1,244**	**68,948**	**1,882**	**13,620**	**1,944**	**67,360**	**-11,995**	**4,650,232**

Annex 4-3(4)

Zahrani [49-61]

Year	Rain	Inlet	Spring	Recharge	Evap	RunOff	Outlet	SurfBal
1992	111,743	0	21,920	78,951	30,998	25,228	615	-2,127
1993	85,241	0	14,903	53,754	29,831	16,936	561	-828
1994	93,107	0	8,875	56,001	32,278	10,836	482	2,586
1995	84,291	0	11,601	57,496	28,005	15,390	585	-5,585
1996	87,160	0	11,746	56,700	29,351	14,138	535	-818
1997	83,804	0	4,418	39,344	22,083	6,743	358	-606
1998	55,052	0	0	30,893	20,007	1,934	188	2,030
1999	40,912	0	0	21,941	21,064	222	194	-2,509
2000	82,849	0	0	54,212	26,232	3,014	312	-1,221
2001	54,853	0	0	32,897	20,474	1,157	206	-82
Average	75,831	0	7,346	48,119	25,032	9,539	403	-816

Year	Recharge	Area= 104.061 km2 Glnflow	ExsPmpUp	SprUp	GOutflow	SubBal	Volume(Strage)
1992	78,951	11,794	7,894	21,920	57,506	3,425	3,062,760
1993	53,754	11,977	7,841	14,903	57,329	-14,342	3,052,580
1994	56,001	11,828	7,841	8,875	55,823	-4,511	3,052,230
1995	57,496	11,711	7,841	11,601	55,961	-6,196	3,050,200
1996	56,700	11,735	7,894	11,746	56,317	-8,522	3,045,880
1997	39,344	11,430	7,841	4,418	54,983	-16,468	3,033,580
1998	30,893	10,844	7,841	0	54,390	-20,494	3,017,240
1999	21,941	10,198	7,841	0	51,798	-27,500	2,993,900
2000	54,212	9,582	7,894	0	51,765	4,136	3,002,250
2001	32,897	9,091	7,841	0	50,206	-16,058	2,990,350
Average	48,119	11,019	7,857	7,346	54,588	-10,853	3,030,097

A Assouad [62-63]

Year	Rain	Inlet	Spring	Recharge	Evap	RunOff	Outlet	SurfBal
1992	147,866	0	2,514	95,224	51,026	9,353	1,764	-7,189
1993	91,031	0	6,190	60,092	42,777	4,475	2,292	-2,415
1994	150,661	0	0	89,595	55,143	3,760	585	1,597
1995	86,829	0	230	51,998	38,591	1,665	482	-3,874
1996	128,788	0	2,104	72,165	56,053	2,997	1,812	-2,135
1997	117,339	0	0	57,186	55,906	1,685	430	2,152
1998	104,113	0	31	49,949	48,794	898	333	4,169
1999	88,133	0	0	36,434	39,831	180	227	-8,339
2000	122,079	0	0	70,655	44,589	5,702	448	686
2001	104,353	0	0	60,803	41,849	2,977	398	-1,275
Average	112,279	0	1,107	63,388	47,416	3,369	875	-1,882

Year	Recharge	Area= 160.124 km2 Glnflow	ExsPmpUp	SprUp	GOutflow	SubBal	Volume(Strage)
1992	95,224	954	5,497	2,514	57,214	30,953	7,410,600
1993	60,092	944	5,458	6,190	55,783	-18,398	7,384,630
1994	89,595	894	5,458	0	50,825	34,406	7,409,470
1995	51,998	903	5,458	230	52,577	-5,366	7,394,540
1996	72,165	913	5,497	2,104	54,019	11,457	7,396,450
1997	57,186	881	5,458	0	50,290	2,298	7,389,170
1998	49,949	880	5,458	31	51,428	-6,088	7,373,520
1999	36,434	810	5,458	0	46,144	-14,358	7,349,600
2000	70,655	803	5,497	0	47,286	18,875	7,358,740
2001	60,803	781	5,458	0	46,918	9,007	7,358,170
Average	63,388	878	5,470	1,107	51,229	6,459	7,382,489

Litani Up [64-68]

Year	Rain	Inlet	Spring	Recharge	Evap	RunOff	Outlet	SurfBal
1992	1,346,371	0	0	834,680	450,051	57,538	12,573	-8,466
1993	1,163,818	0	0	874,480	478,207	11,085	12,425	-12,574
1994	947,315	0	0	455,510	411,587	9,535	9,948	60,730
1995	1,159,396	0	0	741,280	446,789	47,187	11,385	-87,243
1996	964,201	0	0	539,360	365,034	47,568	8,681	3,555
1997	566,035	0	0	360,730	172,942	21,400	5,077	-4,110
1998	465,159	0	0	293,870	130,259	9,470	3,776	27,783
1999	404,056	0	0	188,160	210,842	97	4,952	-0
2000	912,841	0	0	604,330	307,738	16,815	7,327	-23,674
2001	466,493	0	0	255,080	176,159	1,919	4,926	17,404
Average	837,418	0	0	494,748	314,961	22,261	8,107	-2,660

Year	Recharge	Area= 1110.959 km2 Glnflow	ExsPmpUp	SprUp	GOutflow	SubBal	Volume(Strage)
1992	834,680	0	8,637	0	650,479	175,565	49,017,700
1993	874,480	0	8,578	0	571,204	94,698	49,019,200
1994	455,510	0	8,578	0	531,218	-84,284	48,841,700
1995	741,280	0	8,578	0	541,801	190,902	48,939,400
1996	539,360	0	8,637	0	540,501	-9,778	48,838,400
1997	360,730	0	8,578	0	486,667	-133,515	48,609,700
1998	293,870	0	8,578	0	452,217	-166,925	48,349,700
1999	188,160	0	8,578	0	426,586	-247,004	48,009,500
2000	604,330	0	8,637	0	470,356	125,337	48,041,600
2001	255,080	0	8,578	0	421,776	-175,274	47,773,100
Average	494,748	0	8,596	0	509,180	-23,028	48,543,800

Litani Mid [59-60]

Year	Rain	RunIn	Spring	Recharge	Evap	RunOff	Outlet	SurfBal
1992	816,548	57,538	224,620	457,990	281,457	209,930	159,060	10,268
1993	706,712	11,085	231,450	434,970	275,109	131,970	134,860	-28,655
1994	574,528	9,535	143,090	292,230	253,795	67,854	77,049	36,221
1995	703,152	47,187	117,370	384,460	260,777	189,630	91,061	-58,219
1996	584,769	47,568	109,080	309,090	214,950	143,550	72,604	1,224
1997	337,224	21,400	32,500	167,190	93,691	98,867	41,772	-10,396
1998	282,110	9,470	0	90,613	88,485	62,345	25,217	24,919
1999	245,052	97	0	85,670	147,350	3,805	8,324	-0
2000	553,439	16,815	0	212,570	210,375	109,440	52,677	-14,814
2001	276,248	1,919	0	88,916	117,499	34,879	17,315	19,558
Average	507,878	22,261	85,811	252,370	192,349	105,227	67,994	-1,989

Year	Recharge	Area= 673.775 km2 Glnflow	ExsPmpUp	SprUp	GOutflow	SubBal	Volume(Strage)
1992	457,990	518,936	12,236	224,620	567,591	172,479	17,377,200
1993	434,970	440,367	12,133	231,450	559,434	72,309	17,376,500
1994	292,230	400,513	12,133	143,090	559,227	-21,703	17,279,900
1995	384,460	410,726	12,133	117,370	554,275	111,408	17,317,300
1996	309,090	409,031	12,236	109,080	557,996	38,810	17,282,100
1997	167,190	354,174	12,133	32,500	546,364	-89,632	17,138,500
1998	90,613	320,366	12,133	0	516,839	-117,992	16,946,500
1999	85,670	295,842	12,133	0	496,668	-127,289	16,745,300
2000	212,570	338,187	12,236	0	489,073	49,451	16,720,700
2001	88,916	291,427	12,133	0	469,537	-101,326	16,545,400
Average	252,370	377,956	12,164	85,811	531,700	862	17,072,840

Litani Low [61-64]										Area=	446.68 km2				
Year	Rain	RunIn	Spring	Recharge	Evap	RunOff	Outlet	SurfBal	Recharge	GInflow	ExsPmpUp	SprUp	GOutflow	SubBal	Volume(Strage)
1992	427,446	209,927	0	292,560	145,887	213,010	1,274	-15,360	292,560	459,545	4,182	0	666,437	81,486	13,127,800
1993	279,684	131,966	0	156,920	125,236	135,850	992	-7,345	156,920	452,166	4,169	0	652,949	-48,036	13,074,400
1994	415,435	67,854	0	249,720	161,140	70,781	1,083	562	249,720	453,988	4,169	0	658,453	41,089	13,110,300
1995	273,589	189,630	0	166,090	119,914	191,280	1,027	-15,097	166,090	449,808	4,169	0	648,982	-37,252	13,088,000
1996	362,811	143,548	0	210,830	154,170	145,880	1,010	-5,725	210,830	453,021	4,182	0	657,549	2,118	13,066,000
1997	314,737	98,867	0	162,770	147,119	101,370	784	1,568	162,770	444,810	4,169	0	644,884	-41,473	13,018,400
1998	277,893	62,345	0	137,880	130,552	63,646	697	7,658	137,680	422,685	4,169	0	637,309	-81,108	12,932,100
1999	186,890	3,805	0	93,397	111,947	4,561	683	-20,093	93,397	410,209	4,169	0	617,398	-117,962	12,809,000
2000	343,852	109,441	0	212,380	128,962	113,160	709	-2,123	212,380	405,477	4,182	0	622,056	-8,377	12,795,500
2001	278,013	34,879	0	163,910	114,851	36,586	668	-3,126	163,910	392,060	4,169	0	605,789	-63,984	12,736,400
Average	315,975	105,226	0	184,626	133,978	107,612	893	-5,909	184,626	434,377	4,173	0	641,181	-26,350	12,973,670

Assi [65-69]										Area=	1848.837 km2				
Year	Rain	RunIn	Spring	Recharge	Evap	RunOff	Outlet	SurfBal	Recharge	GInflow	ExsPmpUp	SprUp	GOutflow	SubBal	Volume(Strage)
1992	2,240,807	9,740	185,800	1,170,500	625,847	590,670	33,191	15,991	1,170,500	57,262	11,109	185,800	736,692	294,109	70,865,100
1993	1,936,472	7,091	146,510	991,640	650,741	432,080	29,804	-14,003	991,640	58,593	11,027	146,510	732,913	157,787	70,914,700
1994	1,576,504	3,903	107,700	680,680	612,770	264,820	19,113	110,730	680,680	56,649	11,027	107,700	729,053	-110,458	70,696,000
1995	1,929,447	15,631	118,140	995,460	622,838	564,940	28,352	-138,380	995,460	57,030	11,027	118,140	730,751	192,580	70,780,400
1996	1,804,606	8,499	112,790	801,330	516,107	371,710	23,935	12,811	801,330	57,138	11,109	112,790	731,865	2,904	70,675,000
1997	925,343	7,804	65,007	476,330	227,713	289,520	11,881	-7,482	476,330	57,958	11,027	65,007	722,898	-264,649	70,302,100
1998	774,108	3,694	0	333,020	220,755	170,370	1,581	52,098	333,020	59,727	11,027	0	704,428	-322,708	69,871,200
1999	672,422	384	0	296,050	364,359	12,146	3,431	-3,178	296,050	60,321	11,027	0	691,732	-346,391	69,416,800
2000	1,518,835	8,441	0	756,400	515,318	284,930	4,895	-34,288	756,400	62,136	11,109	0	698,254	109,170	69,417,500
2001	758,023	1,844	0	333,630	298,195	96,620	2,313	29,106	333,630	62,159	11,027	0	674,476	-289,712	69,019,800
Average	1,393,617	6,683	73,595	683,504	485,464	306,791	15,808	2,343	683,504	58,898	11,052	73,595	715,267	-57,737	70,196,820

Hasbani [70-73]										Area=	587.424 km2				
Year	Rain	Inlet	Spring	Recharge	Evap	RunOff	Outlet	SurfBal	Recharge	GInflow	ExsPmpUp	SprUp	GOutflow	SubBal	Volume(Strage)
1992	711,899	0	16,782	318,020	218,934	187,240	1,424	5,060	318,020	41,288	6,588	16,782	297,529	38,409	23,330,600
1993	615,268	0	12,718	299,330	231,244	107,980	1,491	-12,058	299,330	40,238	6,582	12,718	297,221	23,047	23,353,600
1994	500,897	0	8,901	201,030	211,110	62,355	1,121	34,182	201,030	38,785	6,582	8,901	295,998	-71,887	23,282,000
1995	613,036	0	9,185	307,580	212,173	150,620	1,437	-49,589	307,580	38,570	6,582	9,185	296,279	34,104	23,316,100
1996	509,825	0	8,954	235,640	175,157	106,530	1,145	307	235,640	39,170	6,588	8,954	296,751	-37,482	23,278,600
1997	294,006	0	2,028	150,890	77,165	71,526	501	-4,047	150,890	37,044	6,582	2,028	293,024	-113,699	23,164,900
1998	245,955	0	0	104,440	75,924	50,742	349	14,496	104,440	31,871	6,582	0	285,007	-155,278	23,009,600
1999	213,646	0	0	86,993	120,918	6,618	553	-1,435	86,993	27,124	6,582	0	276,477	-168,942	22,840,700
2000	482,510	0	0	239,630	170,136	86,210	894	-14,356	239,630	25,447	6,588	0	274,770	-16,282	22,824,400
2001	240,844	0	0	97,152	106,984	27,860	512	8,335	97,152	22,025	6,582	0	265,024	-152,428	22,672,000
Average	442,789	0	5,857	204,071	159,775	85,798	943	-1,910	204,071	34,156	6,584	5,857	287,808	-62,022	23,107,250

											6,100 km2	(1,000 m3)			
S-TOTAL	6,054,516		1,079,008	3,078,433	2,131,657	2,027,337	122,432	-37,653	3,078,433	1,708,472	248,024	1,079,008	3,794,858	-307,414	265,680,366
	100.00%		17.82%	50.85%	35.21%	33.48%	2.02%	-0.62%	50.85%	28.22%	4.10%	17.82%	62.68%	-5.08%	

Coastal Basin [74-87]

Year	Rain	Inlet	Spring	Recharge	Evap	RunOff	DomOut	SurfBal	Recharge	Area=	1690.664 km2 ExistWith	SprUp	GOutflow	SubBal	VoLume
1992	1,883,447	0	144,900	930,290	509,106	388,300	23,422	-53,066	930,290	166,891	92,815	144,600	772,916	86,649	41,876,100
1993	1,094,794	0	89,311	537,590	437,412	204,240	16,815	-11,946	537,590	166,274	92,730	89,311	716,662	-192,842	41,483,300
1994	1,634,123	0	48,721	832,270	556,390	242,900	15,276	34,008	832,270	166,544	92,730	48,721	684,382	172,981	41,656,300
1995	1,034,567	0	74,359	531,850	414,673	204,580	14,845	-57,037	531,850	166,708	92,730	74,359	698,754	-167,285	41,489,000
1996	1,384,966	0	69,581	684,340	543,738	213,120	19,578	-6,230	684,340	166,412	92,815	69,581	711,453	-23,101	41,465,900
1997	1,161,358	0	38,863	515,050	519,019	139,030	14,022	11,098	515,050	164,150	92,730	38,863	666,333	-116,723	41,349,200
1998	1,066,706	0	48,488	469,240	461,932	137,340	13,085	33,590	469,240	159,469	92,730	48,488	662,015	-172,521	41,176,600
1999	691,104	0	11,421	313,590	390,267	80,394	6,283	-58,126	313,590	155,722	92,730	11,421	599,510	-234,352	40,942,300
2000	1,336,309	0	29,339	668,140	455,788	213,030	11,010	-2,326	668,140	155,508	92,815	29,339	631,191	90,305	41,032,600
2001	1,060,109	0	29,385	547,980	406,428	152,880	11,286	-9,079	547,980	149,827	92,730	29,385	610,566	-34,872	40,997,700
Average	1,213,947	0	58,007	605,034	469,688	195,581	14,562	-12,911	605,034	161,930	92,756	58,007	675,378	-59,176	41,326,900

Individual [88-99]

Year	Rain	Inlet	Spring	Recharge	Evap	RunOff	DomOut	SurfBal	Recharge	Area=	285.992 km2 ExistWith	SprUp	GOutflow	SubBal	VoLume
1992	346,594	0	119,340	241,230	87,321	138,980	430	-2,035	241,230	112,499	6,515	119,340	187,320	40,560	12,560,800
1993	299,548	0	104,880	192,240	93,758	119,930	384	-1,857	192,240	112,915	6,509	104,880	188,052	5,710	12,566,500
1994	243,866	0	92,705	133,860	88,140	100,360	290	13,920	133,860	112,395	6,509	92,705	187,456	-40,417	12,526,100
1995	288,481	0	103,780	204,290	88,320	131,910	376	-22,855	204,290	112,394	6,509	103,780	187,424	18,970	12,545,000
1996	248,213	0	98,090	160,400	72,488	113,360	314	-258	160,400	112,427	6,515	98,090	188,026	-19,806	12,525,200
1997	143,139	0	81,835	98,469	34,352	95,388	156	-3,390	98,469	110,288	6,509	81,835	184,835	-84,423	12,460,800
1998	119,745	0	63,727	73,992	33,829	70,987	135	4,528	73,992	105,301	6,509	63,727	178,868	-89,811	12,391,000
1999	104,015	0	56,838	52,617	52,624	57,451	197	-2,036	52,617	99,660	6,509	56,838	172,118	-83,198	12,307,800
2000	234,914	0	80,577	153,080	73,264	95,915	303	-7,070	153,080	98,562	6,515	80,577	170,332	-5,783	12,302,000
2001	117,257	0	48,426	67,321	46,359	52,108	150	744	67,321	93,275	6,509	48,426	163,717	-58,056	12,244,000
Average	216,578	0	86,020	137,750	66,946	97,639	271	-2,011	137,750	106,971	6,511	86,020	180,815	-27,026	12,442,920

											1,977 km2				
S-TOTAL	1,429,522	0	143,027	742,784	536,633	293,220	14,834	-14,922	742,784	268,901	99,266	143,027	856,193	-86,802	53,769,820
	100.00%		10.01%	51.96%	37.54%	20.51%	1.04%	-1.04%	51.96%	18.81%	6.94%	10.01%	59.89%	-6.07%	
										Total Area=	10,076 km2				
G-TOTAL	7,484,039	0	1,222,035	3,821,217	2,668,280	2,320,557	137,266	-52,575	3,821,217	1,977,373	347,290	1,222,035	4,651,051	-394,215	319,450,186
	100.00%		16.33%	51.06%	35.65%	31.01%	1.83%	-0.70%	51.06%	26.42%	4.64%	16.33%	62.15%	-5.27%	

Annex 4.4 NATURAL YEARLY WATER BALANCE

(Unit: 1,000 m3)

Kebir				[1-5]						Area=	333.487	km2	
Year	Rain	RunIn	Spring	Recharge	Evap	RunOff	SurfBal	Recharge	GInflow	SprUp	GOutflow	SubBal	Volume(Strage)
1992	377,326	0	30,145	192,800	108,862	111,470	-5,664	192,800	0	30,145	135,122	27,537	11,154,800
1993	295,099	0	16,719	154,790	105,532	58,985	-7,486	154,790	0	16,719	135,281	2,787	11,157,400
1994	324,418	0	10,408	126,080	109,961	77,933	20,854	126,080	0	10,408	134,948	-19,278	11,138,100
1995	275,757	0	13,796	156,350	101,337	59,153	-27,291	156,350	0	13,796	135,171	7,386	11,145,500
1996	285,515	0	12,781	136,510	103,889	54,074	3,825	136,510	0	12,781	136,168	-12,440	11,133,100
1997	187,567	0	4,006	89,813	77,831	26,682	-2,752	89,813	0	4,006	135,706	-49,899	11,083,200
1998	180,885	0	1,157	76,346	68,074	31,532	6,091	76,346	0	1,157	133,812	-58,623	11,024,500
1999	123,406	0	557	51,577	70,394	11,880	-9,887	51,577	0	557	130,854	-79,835	10,944,700
2000	280,907	0	728	131,600	93,283	58,700	-1,947	131,600	0	728	129,524	1,348	10,946,100
2001	184,319	0	1,502	73,260	70,976	41,994	-408	73,260	0	1,502	127,956	-56,198	10,889,900
Average	251,520	0	9,180	118,913	91,014	53,240	-2,467	118,913	0	9,180	133,454	-23,721	11,061,710

Ostuene				[6-9]						Area=	169.603	km2	
Year	Rain	RunIn	Spring	Recharge	Evap	RunOff	SurfBal	Recharge	GInflow	SprUp	GOutflow	SubBal	Volume(Strage)
1992	183,485	0	27,522	70,554	52,331	91,988	-3,867	70,554	70,225	27,522	112,348	909	4,008,760
1993	133,083	0	19,368	52,423	44,115	58,263	-2,350	52,423	70,952	19,368	109,261	-5,254	4,003,510
1994	177,552	0	15,348	58,230	56,839	67,952	9,879	58,230	70,984	15,348	108,459	5,407	4,008,920
1995	117,578	0	16,339	44,038	44,974	56,854	-11,949	44,038	71,365	16,339	106,999	-7,935	4,000,980
1996	143,977	0	15,468	52,075	53,044	51,807	2,519	52,075	71,565	15,468	107,869	503	4,001,480
1997	101,871	0	10,635	36,474	45,345	30,936	-249	36,474	70,900	10,635	106,041	-9,302	3,992,180
1998	104,932	0	7,550	35,003	42,031	32,474	2,975	35,003	69,534	7,550	104,741	-7,755	3,984,430
1999	63,425	0	5,550	22,495	36,077	15,794	-5,391	22,495	67,825	5,550	101,886	-17,116	3,967,310
2000	145,051	0	6,648	51,396	46,321	54,422	-439	51,396	67,022	6,648	104,016	7,753	3,975,070
2001	108,665	0	6,189	37,015	38,423	39,290	126	37,015	65,110	6,189	103,648	-7,712	3,967,350
Average	127,962	0	13,062	45,970	45,950	49,978	-875	45,970	69,548	13,062	106,507	-4,050	3,990,999

Akkar				[10-13]						Area=	133.127	km2	
Year	Rain	RunIn	Spring	Recharge	Evap	RunOff	SurfBal	Recharge	GInflow	SprUp	GOutflow	SubBal	Volume(Strage)
1992	146,399	0	32,009	70,944	38,028	71,966	-2,529	70,944	17,702	32,009	58,252	-1,615	3,006,460
1993	109,262	0	21,366	51,285	32,713	48,458	-1,828	51,285	17,714	21,366	54,833	-7,200	2,999,260
1994	135,819	0	14,789	56,664	40,511	48,068	5,365	56,664	17,709	14,789	54,599	4,985	3,004,250
1995	98,692	0	16,863	45,702	33,325	44,982	-8,455	45,702	17,743	16,863	53,692	-7,110	2,997,140
1996	113,359	0	15,556	49,650	37,593	41,973	-301	49,650	17,782	15,556	53,841	-1,965	2,995,180
1997	78,132	0	10,871	32,005	30,193	28,031	-1,226	32,005	17,737	10,871	51,882	-13,011	2,982,160
1998	78,711	0	6,947	32,012	28,654	24,013	979	32,012	17,640	6,947	50,697	-7,992	2,974,170
1999	49,597	0	4,534	18,765	25,435	13,084	-3,153	18,765	17,509	4,534	48,984	-17,244	2,956,930
2000	113,237	0	5,239	51,602	33,040	35,418	-1,583	51,602	17,428	5,239	51,656	12,134	2,969,060
2001	81,080	0	6,205	34,417	26,968	26,697	-798	34,417	17,206	6,205	50,941	-5,523	2,963,540
Average	100,429	0	13,438	44,305	32,646	38,269	-1,353	44,305	17,617	13,438	52,938	-4,454	2,984,815

Bared				[14-17]						Area=	266.321	km2	
Year	Rain	RunIn	Spring	Recharge	Evap	RunOff	SurfBal	Recharge	GInflow	SprUp	GOutflow	SubBal	Volume(Strage)
1992	320,277	0	211,350	196,520	75,774	260,010	-681	196,520	52,061	211,350	39,592	-2,361	7,953,740
1993	273,940	0	179,820	163,960	79,172	213,340	-2,706	163,960	52,151	179,820	38,331	-2,046	7,951,690
1994	230,791	0	152,530	115,440	79,400	175,150	13,331	115,440	51,652	152,530	37,898	-23,334	7,928,360
1995	271,259	0	167,440	160,570	77,271	222,130	-21,274	160,570	51,873	167,440	37,645	7,360	7,935,720
1996	230,778	0	157,950	132,110	64,871	191,780	-25	132,110	51,869	157,950	37,609	-11,587	7,924,140
1997	135,202	0	127,900	79,409	32,550	154,190	-3,048	79,409	50,910	127,900	35,680	-33,260	7,890,880
1998	115,318	0	94,296	59,194	32,112	112,440	5,866	59,194	49,066	94,296	33,790	-19,826	7,871,070
1999	97,056	0	92,937	52,301	45,700	93,203	-1,211	52,301	47,058	92,937	31,580	-25,157	7,845,920
2000	219,401	0	116,340	124,750	64,464	152,680	-6,156	124,750	46,690	116,340	33,017	22,085	7,868,010
2001	113,587	0	84,314	57,794	42,143	96,309	1,654	57,794	45,262	84,314	31,165	-12,423	7,855,590
Average	200,761	0	138,488	114,205	59,346	167,123	-1,425	114,205	49,859	138,488	35,631	-10,055	7,902,512

Annex 4-4(2)

Abou Ali					[18-22]					Area=	484.914	km2	
Year	Rain	RunIn	Spring	Recharge	Evap	RunOff	SurfBal	Recharge	GInflow	SprUp	GOutflow	SubBal	Volume(Strage)
1992	567,513	0	236,010	310,890	135,567	361,690	-4,633	310,890	85,420	236,010	164,096	-3,793	15,020,400
1993	467,184	0	202,300	244,280	132,553	298,310	-5,662	244,280	85,459	202,300	144,122	-16,682	15,003,800
1994	443,577	0	167,190	210,440	144,188	233,250	22,916	210,440	85,019	167,190	130,917	-2,653	15,001,100
1995	451,762	0	195,040	239,630	131,094	312,260	-36,180	239,630	85,158	195,040	139,903	-10,157	14,990,900
1996	417,913	0	180,860	215,740	121,775	261,510	-253	215,740	85,341	180,860	134,518	-14,299	14,976,600
1997	258,219	0	139,730	133,990	73,098	196,620	-5,771	133,990	83,993	139,730	125,814	-47,553	14,929,000
1998	234,027	0	102,040	110,800	70,963	145,170	9,131	110,800	81,465	102,040	117,577	-27,348	14,901,700
1999	177,954	0	96,837	82,303	84,085	113,540	-5,134	82,303	78,753	96,837	110,612	-46,394	14,855,300
2000	403,553	0	127,500	212,530	116,544	212,160	-10,184	212,530	78,301	127,500	119,137	44,196	14,899,400
2001	234,568	0	88,473	113,520	81,400	126,470	1,655	113,520	75,500	88,473	120,263	-19,720	14,879,700
Average	365,627	0	153,598	187,412	109,125	226,098	-3,411	187,412	82,441	153,598	130,696	-14,440	14,945,790

Jouz					[23-26]					Area=	186.324	km2	
Year	Rain	RunIn	Spring	Recharge	Evap	RunOff	SurfBal	Recharge	GInflow	SprUp	GOutflow	SubBal	Volume(Strage)
1992	211,563	0	28,143	117,810	56,168	68,687	-2,958	117,810	7,485	28,143	78,395	18,756	5,523,810
1993	171,611	0	21,830	89,899	57,447	47,880	-1,787	89,899	7,647	21,830	78,489	-2,772	5,521,040
1994	163,215	0	14,059	72,737	58,341	38,986	7,209	72,737	7,611	14,059	77,778	-11,488	5,509,550
1995	170,352	0	20,988	97,006	53,840	53,246	-12,752	97,006	7,572	20,988	78,005	5,585	5,515,140
1996	158,584	0	17,393	81,499	50,669	44,805	-996	81,499	7,619	17,393	78,392	-6,668	5,508,480
1997	104,676	0	10,223	53,700	32,545	29,918	-1,265	53,700	7,341	10,223	77,626	-26,807	5,481,670
1998	89,396	0	1,279	40,513	30,935	16,088	3,138	40,513	6,749	1,279	77,195	-31,212	5,450,460
1999	70,804	0	0	28,713	37,228	8,112	-3,249	28,713	6,178	0	75,639	-40,747	5,409,710
2000	150,146	0	770	78,439	47,980	28,121	-3,624	78,439	5,800	770	75,537	7,933	5,417,640
2001	88,276	0	0	38,447	34,761	15,161	-92	38,447	5,382	0	74,203	-30,375	5,387,270
Average	137,862	0	11,468	69,876	45,991	35,100	-1,638	69,876	6,938	11,468	77,126	-11,780	5,472,477

Ibrahim					[27-30]					Area=	346.656	km2	
Year	Rain	RunIn	Spring	Recharge	Evap	RunOff	SurfBal	Recharge	GInflow	SprUp	GOutflow	SubBal	Volume(Strage)
1992	410,358	0	388,300	252,210	112,380	436,750	-2,679	252,210	215,390	388,300	70,730	8,566	6,368,050
1993	346,963	0	356,350	201,420	117,876	389,840	-5,823	201,420	215,138	356,350	72,149	-11,942	6,356,110
1994	298,563	0	312,060	150,120	113,100	333,310	14,093	150,120	214,579	312,060	70,572	-17,933	6,338,180
1995	345,269	0	354,850	215,480	110,566	401,470	-27,400	215,480	214,644	354,850	70,428	4,853	6,343,030
1996	298,721	0	330,180	172,980	94,677	362,350	-1,110	172,980	215,391	330,180	70,355	-12,161	6,330,870
1997	181,323	0	285,150	113,630	50,114	306,770	-4,041	113,630	212,798	285,150	68,163	-26,888	6,303,980
1998	152,939	0	244,410	85,902	48,507	256,790	6,147	85,902	207,473	244,410	64,090	-15,124	6,288,860
1999	126,160	0	225,970	60,613	67,530	228,370	-2,381	60,613	201,210	225,970	59,563	-23,708	6,265,150
2000	282,757	0	300,750	166,750	93,435	332,040	-8,723	166,750	199,926	300,750	58,600	7,328	6,272,470
2001	150,267	0	212,220	77,750	61,592	221,130	2,007	77,750	193,582	212,220	54,636	4,479	6,276,950
Average	259,532	0	301,024	149,686	86,978	326,882	-2,991	149,686	209,013	301,024	65,928	-8,253	6,314,365

Kelb					[31-33]					Area=	254.937	km2	
Year	Rain	RunIn	Spring	Recharge	Evap	RunOff	SurfBal	Recharge	GInflow	SprUp	GOutflow	SubBal	Volume(Strage)
1992	308,958	0	169,170	120,580	81,768	277,820	-2,039	120,580	132,225	169,170	88,921	-5,284	5,842,080
1993	267,021	0	142,240	100,360	87,822	223,260	-2,179	100,360	130,163	142,240	88,950	-867	5,841,420
1994	217,385	0	125,140	69,221	84,166	176,260	12,879	69,221	129,674	125,140	88,617	-14,859	5,826,560
1995	266,052	0	135,070	101,340	82,060	239,170	-21,440	101,340	129,539	135,070	89,004	8,802	5,833,360
1996	221,260	0	131,350	80,401	68,544	203,960	-293	80,401	130,637	131,350	88,624	-8,939	5,824,420
1997	127,596	0	108,280	48,997	32,088	158,020	-3,225	48,997	127,871	108,280	88,271	-19,685	5,804,730
1998	106,742	0	93,589	36,981	32,078	126,480	4,797	36,981	124,844	93,589	87,269	-19,034	5,785,700
1999	92,721	0	87,827	28,392	49,458	104,010	-1,316	28,392	120,241	87,827	87,648	-26,843	5,758,860
2000	209,405	0	97,829	76,983	68,620	168,070	-6,438	76,983	119,996	97,829	88,598	10,552	5,769,410
2001	104,524	0	84,466	32,953	43,951	110,460	1,629	32,953	117,179	84,466	86,692	-21,027	5,748,390
Average	192,166	0	117,496	69,621	63,056	178,751	-1,762	69,621	126,237	117,496	88,259	-9,898	5,803,493

Beirut				[34-37]						Area=	309.867	km2	
Year	Rain	RunIn	Spring	Recharge	Evap	RunOff	SurfBal	Recharge	GInflow	SprUp	GOutflow	SubBal	Volume(Strage)
1992	345,119	0	83,252	196,630	94,257	140,840	-3,357	196,630	21,706	83,252	134,059	1,023	8,250,730
1993	274,286	0	51,738	147,650	95,171	88,278	-5,074	147,650	21,761	51,738	130,196	-12,525	8,238,200
1994	273,482	0	34,794	129,010	98,850	70,013	10,401	129,010	21,599	34,794	129,221	-13,405	8,224,800
1995	271,932	0	41,400	154,290	89,406	90,059	-20,421	154,290	21,548	41,400	129,327	5,110	8,229,910
1996	262,258	0	43,799	137,620	87,148	83,439	-2,145	137,620	21,637	43,799	130,786	-15,333	8,214,570
1997	179,473	0	25,116	91,487	59,396	56,096	-2,390	91,487	21,497	25,116	126,919	-39,051	8,175,530
1998	154,042	0	19,013	69,678	55,382	43,425	4,569	69,678	21,434	19,013	124,279	-52,180	8,123,350
1999	119,186	0	10,402	52,792	63,572	19,503	-6,280	52,792	21,206	10,402	118,248	-54,651	8,068,700
2000	248,332	0	19,700	132,520	80,483	60,355	-5,327	132,520	21,075	19,700	119,172	14,724	8,083,420
2001	152,416	0	14,143	70,215	59,956	36,650	-263	70,215	20,871	14,143	116,056	-39,112	8,044,310
Average	228,052	0	34,336	118,189	78,362	68,866	-3,029	118,189	21,433	34,336	125,826	-20,540	8,165,352

Damour				[38-41]						Area=	186.171	km2	
Year	Rain	RunIn	Spring	Recharge	Evap	RunOff	SurfBal	Recharge	GInflow	SprUp	GOutflow	SubBal	Volume(Strage)
1992	221,338	0	151,830	114,270	56,426	203,900	-1,435	114,270	125,846	151,830	89,935	-1,642	6,371,760
1993	187,915	0	133,020	92,507	59,837	171,130	-2,543	92,507	126,069	133,020	89,520	-3,965	6,367,790
1994	160,052	0	112,290	65,147	58,572	139,340	9,286	65,147	125,336	112,290	88,956	-10,762	6,357,030
1995	167,042	0	130,290	99,843	56,599	176,230	-15,337	99,843	124,941	130,290	89,252	5,238	6,362,270
1996	160,638	0	121,720	78,370	48,767	155,660	-436	78,370	125,603	121,720	89,387	-7,135	6,355,140
1997	96,613	0	96,945	49,282	26,525	120,170	-2,414	49,282	124,438	96,945	88,898	-12,123	6,343,010
1998	81,372	0	69,202	35,781	26,253	85,436	3,105	35,781	122,687	69,202	89,287	-21	6,342,990
1999	68,624	0	58,754	26,524	36,232	66,876	-2,253	26,524	119,273	58,754	89,544	-2,501	6,340,490
2000	152,049	0	97,717	74,882	48,438	130,930	-4,484	74,882	118,030	97,717	89,552	5,643	6,346,130
2001	79,903	0	49,634	31,550	33,322	64,457	208	31,550	115,563	49,634	89,389	8,090	6,354,220
Average	139,555	0	102,140	66,816	45,097	131,413	-1,630	66,816	122,779	102,140	89,372	-1,918	6,354,083

Awali				[42-45]						Area=	334.478	km2	
Year	Rain	RunIn	Spring	Recharge	Evap	RunOff	SurfBal	Recharge	GInflow	SprUp	GOutflow	SubBal	Volume(Strage)
1992	386,391	0	122,200	103,430	104,089	303,130	-2,057	103,430	120,282	122,200	104,693	-3,178	6,233,310
1993	318,985	0	101,990	82,690	109,813	234,380	-5,907	82,690	116,599	101,990	101,048	-3,748	6,229,570
1994	290,983	0	89,362	67,402	112,294	185,970	14,676	67,402	114,356	89,362	99,833	-7,437	6,222,130
1995	316,981	0	96,290	82,881	101,412	255,800	-26,617	82,881	115,504	96,290	100,166	1,929	6,224,060
1996	286,131	0	94,152	72,880	95,097	213,890	-1,589	72,880	116,775	94,152	101,205	-5,702	6,218,360
1997	182,612	0	78,024	46,345	56,645	162,150	-4,506	46,345	114,155	78,024	98,249	-15,774	6,202,590
1998	155,199	0	65,336	35,728	54,062	125,100	5,650	35,728	116,241	65,336	96,759	-10,126	6,192,460
1999	125,695	0	59,088	29,336	69,483	89,611	-3,647	29,336	111,636	59,088	92,288	-10,404	6,182,050
2000	270,878	0	66,992	68,815	91,594	186,590	-9,127	68,815	109,779	66,992	95,021	16,581	6,198,630
2001	152,957	0	58,263	34,831	64,480	112,480	-570	34,831	110,084	58,263	92,808	-5,956	6,192,680
Average	248,681	0	83,170	62,434	85,897	186,910	-3,389	62,434	114,541	83,170	98,187	-4,381	6,209,584

Saintaniq				[46-48]						Area=	161.873	km2	
Year	Rain	RunIn	Spring	Recharge	Evap	RunOff	SurfBal	Recharge	GInflow	SprUp	GOutflow	SubBal	Volume(Strage)
1992	166,233	0	12,575	107,940	45,580	29,388	-4,100	107,940	1,985	12,575	85,351	11,998	4,738,830
1993	120,051	0	6,314	72,156	43,978	12,125	-1,895	72,156	2,008	6,314	83,215	-15,364	4,723,470
1994	147,145	0	2,667	86,732	49,224	10,875	2,980	86,732	1,956	2,667	80,863	5,158	4,728,630
1995	118,278	0	2,334	71,902	41,912	13,755	-6,957	71,902	1,959	2,334	81,636	-10,109	4,718,520
1996	133,917	0	2,643	79,474	46,277	11,828	-1,020	79,474	1,973	2,643	82,346	-3,541	4,714,980
1997	105,026	0	0	57,687	38,183	8,513	643	57,687	1,950	0	79,810	-20,173	4,694,800
1998	91,702	0	0	49,882	34,226	4,951	2,663	49,882	1,939	0	79,695	-27,894	4,666,910
1999	85,260	0	0	34,971	34,253	1,236	-5,199	34,971	1,879	0	75,153	-38,304	4,628,610
2000	126,865	0	0	75,542	40,931	11,999	-1,607	75,542	1,857	0	74,455	2,943	4,631,550
2001	91,348	0	0	53,282	33,304	5,259	-497	53,282	1,823	0	72,406	-17,301	4,614,250
Average	116,582	0	2,653	68,955	40,787	10,993	-1,499	68,955	1,933	2,653	79,493	-11,259	4,686,055

Annex 4-4(4)

Zahrani				[49-51]						Area=	104.061	km2	
Year	Rain	RunIn	Spring	Recharge	Evap	RunOff	SurfBal	Recharge	GInflow	SprUp	GOutflow	SubBal	Volume(Strage)
1992	111,743	0	26,899	79,033	31,110	30,710	-2,212	79,033	12,396	26,899	58,953	5,577	3,077,430
1993	85,241	0	19,115	53,821	30,205	21,663	-1,333	53,821	12,386	19,115	58,474	-11,382	3,066,040
1994	93,107	0	10,028	56,031	32,394	12,207	2,504	56,031	12,274	10,028	56,641	1,435	3,067,480
1995	84,291	0	14,054	57,548	28,166	18,313	-5,682	57,548	12,262	14,054	57,347	-1,591	3,065,890
1996	87,160	0	13,471	55,739	29,428	16,319	-853	55,739	12,269	13,471	57,844	-3,306	3,062,580
1997	63,604	0	5,907	39,379	22,330	8,462	-659	39,379	12,076	5,907	56,676	-11,128	3,051,450
1998	55,052	0	0	30,900	20,486	2,046	1,619	30,900	11,853	0	56,252	-13,499	3,037,950
1999	40,912	0	0	21,948	21,369	344	-2,749	21,948	11,557	0	53,881	-20,376	3,017,580
2000	82,549	0	0	54,221	26,675	3,261	-1,607	54,221	11,194	0	54,052	11,363	3,028,940
2001	54,653	0	0	32,905	20,664	1,297	-214	32,905	10,922	0	52,678	-8,851	3,020,090
Average	75,831	0	8,947	48,153	26,282	11,462	-1,119	48,153	11,919	8,947	56,300	-5,176	3,049,543

A Assouad				[52-53]						Area=	160.124	km2	
Year	Rain	RunIn	Spring	Recharge	Evap	RunOff	SurfBal	Recharge	GInflow	SprUp	GOutflow	SubBal	Volume(Strage)
1992	147,666	0	19,323	96,314	52,401	26,326	-8,051	96,314	1,131	19,323	68,463	9,638	7,436,600
1993	91,031	0	13,708	50,644	43,954	13,722	-3,582	50,644	1,120	13,708	66,860	-28,824	7,407,780
1994	150,661	0	1,408	89,715	56,740	5,242	372	89,715	1,066	1,408	61,700	27,674	7,435,460
1995	88,629	0	6,374	52,424	40,439	7,771	-5,632	52,424	1,078	6,374	63,322	-16,194	7,419,260
1996	128,788	0	8,611	72,646	57,648	10,572	-3,467	72,646	1,088	8,611	64,611	512	7,419,770
1997	117,339	0	2,210	57,337	58,700	3,850	-339	57,337	1,055	2,210	60,879	-4,696	7,415,080
1998	104,113	0	5,020	50,290	51,160	5,583	2,100	50,290	1,056	5,020	61,799	-15,474	7,399,600
1999	68,133	0	0	36,450	40,764	264	-9,346	36,450	984	0	56,425	-18,990	7,380,620
2000	122,079	0	0	70,679	45,389	6,010	1	70,679	979	0	57,552	14,106	7,394,720
2001	104,353	0	0	60,626	42,321	3,252	-1,846	60,626	958	0	57,181	4,403	7,399,120
Average	112,279	0	5,665	63,713	48,952	8,259	-2,979	63,713	1,052	5,665	61,883	-2,784	7,410,801

Litani Up				[54-58]						Area=	1110.959	km2	
Year	Rain	RunIn	Spring	Recharge	Evap	RunOff	SurfBal	Recharge	GInflow	SprUp	GOutflow	SubBal	Volume(Strage)
1992	1,346,371	0	99,759	840,140	454,038	169,490	-17,535	840,140	0	99,759	664,152	76,229	54,490,000
1993	1,163,818	0	29,501	674,810	490,257	44,157	-16,106	674,810	0	29,501	636,509	8,800	54,498,400
1994	947,315	0	4,867	452,850	427,895	22,343	49,097	452,850	0	4,867	606,397	-158,414	54,323,700
1995	1,159,396	0	8,489	719,780	466,903	67,516	-86,315	719,780	0	8,489	609,597	101,694	54,435,600
1996	964,201	0	8,963	531,280	386,004	54,929	954	531,280	0	8,963	608,167	-85,850	54,341,900
1997	556,035	0	0	344,650	178,512	37,074	-4,197	344,650	0	0	559,702	-215,052	54,108,700
1998	465,159	0	0	288,120	136,780	10,399	27,858	288,120	0	0	497,735	-209,615	53,880,600
1999	404,056	0	0	189,900	213,904	250	-0	189,900	0	0	468,129	-278,229	53,583,600
2000	912,541	0	0	591,940	322,932	21,332	-23,661	591,940	0	0	501,389	90,551	53,682,200
2001	455,493	0	0	256,750	178,959	2,371	17,411	256,750	0	0	469,990	-213,240	53,455,000
Average	837,418	0	15,158	489,022	325,818	42,986	-5,249	489,022	0	15,158	562,177	-88,313	54,079,970

Litani Mid				[59-60]						Area=	673.775	km2	
Year	Rain	RunIn	Spring	Recharge	Evap	RunOff	SurfBal	Recharge	GInflow	SprUp	GOutflow	SubBal	Volume(Strage)
1992	816,546	169,487	922,220	972,930	277,369	647,730	10,217	972,930	542,440	922,220	577,336	15,818	17,582,000
1993	705,712	44,157	869,360	931,870	291,541	425,720	-29,902	931,870	515,294	869,360	573,298	4,508	17,586,500
1994	574,528	22,343	769,980	809,850	259,264	262,180	35,549	809,850	485,174	769,980	579,218	-54,169	17,532,300
1995	703,152	67,516	793,640	910,900	265,727	445,370	-57,688	910,900	488,051	793,640	575,380	29,928	17,562,200
1996	584,769	54,929	781,410	847,390	219,754	353,010	952	847,390	485,973	781,410	577,408	-25,457	17,536,800
1997	337,224	37,074	632,730	689,740	98,682	230,920	-12,313	689,740	437,332	632,730	578,591	-84,251	17,452,500
1998	282,110	10,399	392,280	482,640	90,265	88,541	23,342	482,640	374,309	392,280	572,522	-107,853	17,344,600
1999	245,052	250	222,950	311,300	148,705	10,202	-1,950	311,300	344,811	222,950	564,767	-131,611	17,213,000
2000	553,439	21,332	197,660	412,550	211,755	182,860	-14,735	412,550	376,297	197,660	564,065	27,123	17,240,200
2001	276,248	2,371	34,725	124,950	119,598	50,663	18,130	124,950	345,716	34,725	552,797	-116,854	17,123,300
Average	507,878	42,986	561,696	649,412	198,266	267,720	-2,840	649,412	439,540	561,696	571,538	-44,282	17,417,340

Litani Low			[61-64]							Area=	446.58	km2	
Year	Rain	RunIn	Spring	Recharge	Evap	RunOff	SurfBal	Recharge	GInflow	SprUp	GOutflow	SubBal	Volume(Strage)
1992	427,446	647,735	30,013	253,980	162,459	703,770	-15,013	253,980	461,323	30,013	667,730	17,561	13,260,300
1993	279,684	425,718	20,819	138,300	143,964	454,370	-10,430	138,300	458,657	20,819	649,477	-73,339	13,187,000
1994	415,435	262,184	1,139	250,910	162,610	267,090	-1,859	250,910	464,494	1,139	656,651	57,614	13,244,600
1995	273,589	445,370	8,187	167,700	117,141	454,040	-11,729	167,700	459,471	8,187	649,194	-30,210	13,214,400
1996	362,611	353,014	11,497	207,220	160,830	366,830	-7,755	207,220	460,781	11,497	658,289	-1,785	13,212,600
1997	314,737	230,922	2,450	163,600	149,906	236,050	-1,439	163,600	462,217	2,450	647,068	-23,702	13,188,900
1998	277,893	88,541	6,491	137,880	133,580	96,646	4,821	137,880	457,059	6,491	642,457	-54,009	13,134,900
1999	186,690	10,202	0	93,446	112,847	11,475	-20,877	93,446	452,293	0	627,722	-81,983	13,052,900
2000	343,652	162,860	0	212,710	129,598	166,850	-2,648	212,710	451,310	0	637,965	26,055	13,079,000
2001	278,013	50,663	0	164,020	115,725	52,586	-3,652	164,020	443,574	0	627,103	-19,509	13,059,500
Average	315,975	267,721	8,060	178,977	138,868	280,971	-7,058	178,977	457,118	8,060	646,365	-18,331	13,163,410

Assi			[65-69]							Area=	1848.837	km2	
Year	Rain	RunIn	Spring	Recharge	Evap	RunOff	SurfBal	Recharge	GInflow	SprUp	GOutflow	SubBal	Volume(Strage)
1992	2,240,607	48,632	331,530	1,175,100	630,569	762,630	52,501	1,175,100	51,898	331,530	743,709	151,729	71,457,000
1993	1,936,472	26,948	268,890	995,910	655,109	577,200	4,084	995,910	51,140	268,890	739,728	38,435	71,495,400
1994	1,576,504	13,280	203,960	683,800	616,973	373,310	119,660	683,800	51,203	203,960	736,353	-205,306	71,290,100
1995	1,929,447	25,341	237,500	999,260	627,093	695,970	-130,030	999,260	51,382	237,500	737,901	75,234	71,365,400
1996	1,604,606	19,866	217,320	804,600	519,266	494,050	23,873	804,600	51,624	217,320	738,581	-99,674	71,265,700
1997	925,343	7,687	129,300	478,170	231,297	361,850	-8,988	478,170	52,499	129,300	731,298	-329,924	70,935,800
1998	774,108	3,739	28,265	333,860	223,892	197,200	51,164	333,860	54,903	28,265	722,253	-361,759	70,574,000
1999	672,422	487	23,424	297,190	367,885	35,293	-4,038	297,190	56,392	23,424	720,018	-389,857	70,184,100
2000	1,518,635	8,643	90,518	759,080	519,256	373,950	-34,494	759,080	58,568	90,518	726,532	602	70,184,800
2001	758,023	1,916	29	334,200	299,738	97,231	28,795	334,200	59,447	29	710,559	-316,937	69,867,800
Average	1,393,817	15,654	153,074	686,117	469,108	396,868	10,253	686,117	53,906	153,074	730,693	-143,746	70,862,010

Hasbani				[70-73]						Area=	587.424	km2	
Year	Rain	RunIn	Spring	Recharge	Evap	RunOff	SurfBal	Recharge	GInflow	SprUp	GOutflow	SubBal	Volume(Strage)
1992	711,899	0	31,224	314,870	217,628	206,300	4,325	314,870	40,445	31,224	300,006	24,085	23,402,000
1993	615,268	0	24,262	297,410	231,898	122,640	-12,418	297,410	39,025	24,262	299,144	13,029	23,415,000
1994	500,897	0	15,643	199,280	210,808	72,330	34,125	199,280	39,527	15,643	297,829	-74,665	23,340,400
1995	613,036	0	18,867	306,810	212,466	162,380	-49,749	306,810	40,841	18,867	298,237	30,546	23,370,900
1996	509,825	0	15,966	234,340	175,551	115,810	96	234,340	41,346	15,966	298,550	-38,829	23,332,000
1997	294,006	0	7,086	150,980	77,810	76,678	-4,575	150,980	42,134	7,086	295,139	-109,111	23,222,900
1998	245,955	0	0	104,490	76,634	50,871	13,964	104,490	43,355	0	288,089	-140,244	23,082,700
1999	213,646	0	0	87,100	121,594	6,871	-1,919	87,100	42,975	0	280,785	-150,710	22,932,000
2000	482,510	0	0	239,770	170,543	86,756	-14,554	239,770	44,058	0	280,213	3,615	22,935,600
2001	240,844	0	0	97,214	107,472	28,116	8,042	97,214	43,017	0	271,555	-131,324	22,804,300
Average	442,789	0	11,305	203,226	160,240	92,895	-2,266	203,226	41,672	11,305	290,955	-57,361	23,183,780

											8,100	km2	(1,000 m3)
S-TOTAL	6,054,516		1,743,957	3,435,000	2,151,783	2,574,785	-36,727	3,435,000	1,827,546	1,743,957	4,003,329	-484,742	273,058,089
	100.00%		28.80%	56.73%	35.54%	42.53%	-0.61%	56.73%	30.18%	28.80%	66.12%	-8.01%	4509.99%

Annex 4-4(6)

Coastal Basin			[74-97]							Area=	1690.664	km2	
Year	Rain	RunIn	Spring	Recharge	Evap	RunOff	SurfBal	Recharge	GInflow	SprUp	GOutflow	SubBal	Volume(Strage)
1992	1,653,447	0	177,770	930,910	513,821	444,170	-57,689	930,910	165,780	177,770	832,726	86,198	42,050,100
1993	1,094,794	0	118,490	538,090	441,524	249,310	-15,638	538,090	166,944	118,490	776,024	-189,480	41,860,700
1994	1,634,123	0	78,309	832,780	562,639	286,830	30,385	832,780	165,407	78,309	744,476	175,400	42,036,000
1995	1,034,557	0	104,270	532,350	418,848	248,460	-60,829	532,350	165,645	104,270	758,867	-165,146	41,870,900
1996	1,384,966	0	102,490	684,920	549,595	264,640	-11,706	684,920	165,366	102,490	771,032	-23,230	41,847,700
1997	1,161,358	0	63,948	515,510	525,980	179,080	4,728	515,510	163,251	63,948	726,155	-111,338	41,736,300
1998	1,068,708	0	69,314	469,650	468,900	172,510	26,957	469,650	158,712	69,314	722,698	-163,639	41,572,700
1999	691,104	0	32,351	313,900	396,560	86,738	-73,741	313,900	155,334	32,351	662,316	-225,436	41,347,300
2000	1,336,309	0	64,830	688,660	460,383	258,350	-6,255	688,660	155,622	64,830	695,242	84,209	41,431,500
2001	1,080,109	0	55,748	548,410	409,998	189,610	-12,157	548,410	150,297	55,748	671,988	-29,033	41,402,400
Average	1,213,947	0	86,752	605,518	474,825	237,950	-17,594	605,518	161,236	86,752	736,152	-56,150	41,715,560

Individuals			[98-99]							Area=	285.992	km2	Volume(Strage)
Year	Rain	RunIn	Spring	Recharge	Evap	RunOff	SurfBal	Recharge	GInflow	SprUp	GOutflow	SubBal	Volume(Strage)
1992	346594	0	161000	243610	90,795	178,230	-5,045	243,610	108,772	161,000	182,471	8,913	12,793,900
1993	299548	0	126300	193490	97,417	140,100	-5,168	193,490	109,531	126,300	181,749	-5,023	12,788,900
1994	243886	0	102890	134470	91,704	110,040	10,546	134,470	108,877	102,890	180,954	-40,500	12,748,400
1995	298461	0	114330	204930	90,805	141,930	-24,873	204,930	108,733	114,330	180,906	18,430	12,766,800
1996	248213	0	110410	161130	74,400	125,030	-1,939	161,130	108,705	110,410	181,346	-21,919	12,744,900
1997	143139	0	82142	98479	34,802	95,823	-3,823	98,479	106,408	82,142	178,857	-56,112	12,688,800
1998	119745	0	64118	74003	34,331	71,467	4,061	74,003	101,333	64,118	173,895	-62,677	12,626,100
1999	104015	0	57307	52633	53,176	58,069	-2,556	52,633	95,734	57,307	168,087	-77,028	12,549,100
2000	234914	0	81140	153100	74,119	96,725	-7,893	153,100	94,743	81,140	168,803	-97	12,549,000
2001	117257	0	49076	67331	45,808	52,872	321	67,331	89,643	49,076	161,010	-53,111	12,495,900
Average	215,575	0	94,871	138,318	68,736	107,029	-3,837	138,318	103,248	94,871	175,608	-28,912	12,675,180

											1,977	km2	
S-TOTAL	1,429,522		181,623	743,836	543,560	344,978	-21,231	743,836	264,483	181,623	911,759	-85,062	54,390,740
	100.00%		12.71%	52.03%	38.02%	24.13%	-1.49%	52.03%	18.50%	12.71%	63.78%	-5.95%	3804.82%
										Total Area=	10,076	km2	
G-TOTAL	7,484,039		1,925,580	4,178,835	2,695,343	2,919,763	-57,959	4,178,835	2,092,029	1,925,580	4,915,088	-569,804	327,448,829
	100.00%		25.73%	55.84%	36.01%	39.01%	-0.77%	55.84%	27.95%	25.73%	65.67%	-7.61%	4375.30%