

JAPAN INTERNATIONAL COOPERATION AGENCY
MINISTRY OF WATER AND IRRIGATION
THE HASHEMITE KINGDOM OF JORDAN

**THE STUDY ON
WATER RESOURCES MANAGEMENT
IN
THE HASHEMITE KINGDOM OF JORDAN**

FINAL REPORT VOLUME III

**SUPPORTING REPORT
FOR**

**PART-A WATER RESOURCES MANAGEMENT
MASTER PLAN**

**CHAPTER 1 PRECONDITIONS OF WATER RESOURCES
MANAGEMENT MASTER PLAN**

**CHAPTER 2 WATER RESOURCES POTENTIAL AND
DEVELOPMENT PLAN**

DECEMBER 2001

YACHIYO ENGINEERING CO.,LTD.

Exchange Rate Employed
in the Study

US\$1.00=0.700JD=JP¥110
December, 2000

The Study on Water Resources Management in the Hashemite Kingdom of Jordan

**FINAL REPORT VOLUME III
SUPPORTING REPORT
FOR**

PART-A “WATER RESOURCES MANAGEMENT MASTER PLAN”

Chapter 1 Preconditions of Water Resources Management Master Plan

Chapter 2 Water Resources Potential and Development Plan

Table of Contents

	<u>page</u>
Supporting Report for “Chapter 1 Preconditions of Water Resources Management Master Plan”	
Annex to 1.1.2 Irrigation Water-----	SA1-1
Annex to 1.3.1 GDP-----	SA1-3
Annex to 1.3.2 National Budget-----	SA1-4
Annex to 1.3.3 Results of Socio-Economic Interview Survey-----	SA1-5
Annex to 1.5.1 Municipal Water-----	SA1-52
Annex to 1.5.2 Industrial Water-----	SA1-54
Annex to 1.5.3 Touristic Water-----	SA1-65
Supporting Report for “Chapter 2 Water Resources Potential and Development Plan”	
Annex to 2.1 Surface Water	
2.1.1 Rainfall and Evaporation-----	SA2-1
2.1.2 Runoff-----	SA2-2
2.1.3 The Dead Sea-----	SA2-2
2.1.4 Present Use of Surface Water-----	SA2-2
Annex to 2.2 Groundwater	
2.2.1 General Landscape and Geology of Jordan-----	SA2-130
2.2.2 Basin and Aquifer System-----	SA2-134
2.2.3 Brackish Groundwater in Middle----- and Upper Aquifer Systems	SA2-140
2.2.4 Groundwater Monitoring Records-----	SA2-145

SUPPORTING REPORT
FOR

CHAPTER 1
Preconditions of Water Resources
Management Master Plan

**Supporting Report for “Chapter 1 Preconditions of
Water Resources Management Master Plan”**

List of Contents

	<u>page</u>
Annex to 1.1.2 Irrigation Water-----	SA1-1
Annex to 1.3.1 GDP-----	SA1-3
Annex to 1.3.2 National Budget-----	SA1-4
Annex to 1.3.3 Results of Socio-Economic Interview Survey-----	SA1-5
Annex to 1.5.1 Municipal Water-----	SA1-52
Annex to 1.5.2 Industrial Water-----	SA1-54
Annex to 1.5.3 Touristic Water-----	SA1-65

ANNEX to 1.1.2
Irrigation Water

Table 1.1.2-2(1) Cropped Area in Jordan by Governorate and Type of Crop in dunum*(1993)

Governorate	Fruit Trees	Field Crops	Vegetables	Total
Amman	66,762	474,756	32,730	574,248
Zarqa	38,941	72,409	6,377	117,727
Mafrq	44,506	354,173	18,635	417,314
Irbid	239,188	188,764	24,648	452,600
Ajloun	0	0	0	0
Jarash	0	0	0	0
Balqa	35,170	21,079	3,535	59,784
Madaba	0	0	0	0
Karak	17,506	387,340	3,260	408,106
Ma'an	36,903	173,962	16,812	227,677
Tafeila	13,556	47,317	254	61,127
Aqaba	0	0	0	0
Jordan Valley	78,164	52,406	166,968	297,538
Total Jordan	570,696	1,772,206	273,219	2,616,121

* One dunum=1/10 of a hectare

Source: Dept. of Statistics-Annual Agricultural Statistics . July. 1994

Table 1.1.2-2(3) Cropped Area in Jordan by Governorate and Type of Crop in dunum*(1995)

Governorate	Fruit Trees	Field Crops	Vegetables	Total
Amman	43,388	408,634	21,022	473,044
Zarqa	39,870	49,356	9,055	98,281
Mafrq	65,321	372,393	178,341	616,055
Irbid	232,411	110,649	32,673	375,733
Ajloun	50,396	4,354	1,203	55,953
Jarash	60,753	25,932	585	87,270
Balqa	35,180	12,655	5,239	53,074
Madaba	28,375	63,631	2,066	94,072
Karak	18,979	191,468	15,979	226,426
Ma'an	29,732	103,969	14,064	147,765
Tafeila	13,556	34,303	468	48,327
Aqaba	7,255	43,545	6,502	57,302
Jordan Valley	82,783	49,549	143,114	275,446
Total Jordan	707,999	1,470,438	430,311	2,608,748

* One dunum=1/10 of a hectare

Source: Dept. of Statistics-Annual Agricultural Statistics . July. 1996

Table 1.1.2-2(2) Cropped Area in Jordan by Governorate and Type of Crop in dunum*(1994)

Governorate	Fruit Trees	Field Crops	Vegetables	Total
Amman	69,802	302,380	32,432	404,614
Zarqa	39,645	40,989	11,489	92,123
Mafrq	64,787	231,262	76,443	372,492
Irbid	338,022	96,984	7,995	443,001
Ajloun	0	0	0	0
Jarash	0	0	0	0
Balqa	35,170	17,276	2,408	54,854
Madaba	0	0	0	0
Karak	17,506	207,398	9,665	234,569
Ma'an	36,913	176,261	20,242	233,416
Tafeila	13,556	32,283	15	45,854
Aqaba	0	0	0	0
Jordan Valley	80,525	43,550	152,552	276,627
Total Jordan	695,926	1,148,383	313,241	2,157,550

* One dunum=1/10 of a hectare

Source: Dept. of Statistics-Annual Agricultural Statistics . July. 1995

Table 1.1.2-2(4) - Cropped Area in Jordan by Governorate and Type of Crop in dunum*(1996)

Governorate	Fruit Trees	Field Crops	Vegetables	Total
Amman	44,332	387,706	21,869	453,907
Zarqa	40,075	52,933	11,357	104,365
Mafrq	66,986	249,991	40,640	357,617
Irbid	233,929	102,002	10,300	346,231
Ajloun	50,551	3,519	1,058	55,128
Jarash	63,071	10,942	980	74,993
Balqa	35,190	12,941	4,240	52,371
Madaba	28,688	29,773	3,377	61,838
Karak	18,079	135,701	5,147	158,927
Ma'an	29,792	73,189	9,148	112,129
Tafeila	13,556	75,826	0	89,382
Aqaba	7,286	14,460	18,246	39,992
Jordan Valley	87,270	33,988	145,141	266,399
Total Jordan	718,805	1,182,971	271,503	2,173,279

* One dunum=1/10 of a hectare

Source: Dept. of Statistics-Annual Agricultural Statistics . July. 1997

Table 1.1.2-2(5) Cropped Area in Jordan by Governorate and Type of Crop in dunum*(1997)

Governorate	Fruit Trees	Field Crops	Vegetables	Total
Amman	94,003	351,452	19,778	465,233
Zarqa	49,348	43,536	13,109	105,993
Mafraq	84,635	328,228	33,650	446,513
Irbid	201,500	186,453	14,734	402,687
Ajloun	50,975	13,825	1,433	66,233
Jarash	86,793	23,875	2,556	113,224
Balqa	56,316	26,452	4,379	87,147
Madaba	30,885	90,402	4,840	126,127
Karak	31,363	236,012	6,618	273,993
Ma'an	28,078	142,458	24,166	194,702
Tafeila	19,614	49,389	2,382	71,385
Aqaba	7,984	20,511	13,036	41,531
Jordan Valley	99,944	66,479	162,147	328,570
Total Jordan	841,438	1,579,072	302,828	2,723,338

* One dunum=1/10 of a hectare

Source: Dept. of Statistics-Annual Agricultural Statistics . Jan. 1998

Table 1.1.2-2(6) Cropped Area in Jordan by Governorate and Type of Crop in dunum*(1998)

Governorate	Fruit Trees	Field Crops	Vegetables	Total
Amman	84,094	364,310	37,645	486,049
Zarqa	49,377	48,755	10,039	108,171
Mafraq	85,330	428,799	42,329	556,458
Irbid	207,193	141,397	14,871	363,461
Ajloun	51,287	6,921	5,941	64,149
Jarash	88,618	48,003	15,990	152,611
Balqa	56,671	14,080	14,720	85,471
Madaba	31,114	99,650	7,565	138,329
Karak	31,363	213,423	10,715	255,501
Ma'an	28,422	185,077	22,217	235,716
Tafeila	19,614	70,130	0	89,744
Aqaba	9,129	23,581	7,739	40,449
Jordan Valley	104,256	45,899	143,226	293,381
Total Jordan	846,468	1,690,025	332,997	2,869,490

* One dunum=1/10 of a hectare

Source: Dept. of Statistics-Annual Agricultural Statistics . Aug. 1999

Table 1.1.2-2(7) Cropped Area in Jordan by Governorate and Type of Crop in dunum*(1999)

Governorate	Fruit Trees	Field Crops	Vegetables	Total
Amman	867,802	302,720	13,299	1,183,821
Zarqa	49,743	74,167	23,836	147,746
Mafraq	85,341	403,758	62,602	551,701
Irbid	208,433	417,817	6,286	632,536
Ajloun	53,154	16,488	3,520	73,162
Jarash	89,638	23,788	3,767	117,193
Balqa	56,671	59,622	35,204	151,497
Madaba	31,597	39,256	20,498	91,351
Karak	32,695	259,167	2,270	294,132
Ma'an	28,658	117,172	21,726	167,556
Tafeila	19,614	57,072	1,048	77,734
Aqaba	9,132	12,169	11,564	32,865
Jordan Valley	105,899	27,668	151,794	285,361
Total Jordan	1,638,377	1,810,864	357,414	3,806,655

* One dunum=1/10 of a hectare

Source: Dept. of Statistics-Annual Agricultural Statistics . May 2000

ANNEX to 1.3.1
GDP

Table 1.3.1-2 GDP Projections 1998-2003 at 1997 Constant Prices

(Unit: JD million)

Sector	1998	1999	2000	2001	2002	2003
Agriculture	136	127	129	132	137	142
Mining	174	181	197	214	234	255
Manufacturing	601	595	632	672	716	762
Domestic Trade, Restaurants, etc.	537	570	603	650	701	757
Insurance and Financial Services	158	164	171	179	188	198
Total Productive Sectors	1,607	1,637	1,731	1,847	1,976	2,115
Electricity and Water	121	130	140	152	164	177
Construction	209	211	213	215	217	219
Transportation, Storage and Communications	666	679	707	760	825	899
Total Infrastructure Sectors	995	1,020	1,060	1,127	1,206	1,296
Government Services	900	918	938	961	985	1,010
Personal and Social Services	162	170	180	194	209	225
Non-Profit Services	53	55	58	61	64	68
Home Services	5	5	5	6	6	6
Housing	632	653	681	710	749	805
Total Service Sectors	1,752	1,801	1,862	1,932	2,013	2,114
Total Sectors	4,354	4,457	4,654	4,906	5,195	5,524
Banking Services	-82	-87	-92	-97	-102	-109
GDP at Cost Prices	4,272	4,370	4,562	4,809	5,093	5,416
Indirect Taxes (Net)	783	785	800	820	847	880
GDP at Market Prices	5,055	5,155	5,362	5,630	5,939	6,296

Source: MOP 5 Years Economic and Social Development Plan; 1999/11/2

Table 1.3.1-3 GDP Growth Rate Projections 1998-2003 at 1997 Constant Prices

(Unit: %)

Sector	1998	1999	2000	2001	2002	2003
Agriculture	-7.5	-6.6	1.6	2.3	3.8	3.6
Mining	3.0	4.0	8.8	8.6	9.3	9.0
Manufacturing	1.5	-1.0	6.2	6.3	6.5	6.4
Domestic Trade, Restaurants, etc.	3.9	6.1	5.8	7.8	7.8	8.0
Insurance and Financial Services	5.9	3.8	4.3	4.7	5.0	5.3
Total Productive Sectors	2.1	1.9	5.7	6.7	7.0	7.0
Electricity and Water	3.0	7.4	7.7	8.6	7.9	7.9
Construction	-6.0	1.0	0.9	0.9	0.9	0.9
Transportation, Storage and Communications	1.0	2.0	4.1	7.5	8.6	9.0
Total Infrastructure Sectors	-0.3	2.5	3.9	6.3	7.0	7.5
Government Services	1.0	2.0	2.2	2.5	2.5	2.5
Personal and Social Services	4.0	4.9	5.9	7.8	7.7	7.7
Non-Profit Services	0.8	3.8	5.5	5.2	4.9	6.3
Home Services	-1.9	0.0	0.0	20.0	0.0	0.0
Housing	0.2	3.3	4.3	4.3	5.5	7.5
Total Service Sectors	1.0	2.8	3.4	3.8	4.2	5.0
Total Sectors	1.1	2.4	4.4	5.4	5.9	6.3

Source: MOP 5 Years Economic and Social Development Plan; 1999/11/2

ANNEX to 1.3.2
National Budget

Table 1.3.2-3 Current and Capital Expenditures of Government Ministries/Departments, 1998
 (Unit: JD thousand)

Item	Capital	Current
Royal Hashemite Court		15,995.0
House of Parliament		3,081.0
Prime Minister's Office, etc.		1,477.0
Audit Bureau	30.0	1,846.0
Ministry of Administrative Development		179.5
Civil Service Commission		435.5
Bureau of Administrative Control & Inspection	13.0	451.0
Ministry of Defence		336,000.0
Royal Medical Services	8,000.0	41,000.0
Royal Jordanian Geographic Center	460.0	977.0
Ministry of Interior	794.4	2,975.3
MI/Dept. of Civil Status & Passports	389.0	3,254.0
MI/Public Security	13,957.0	103,300.0
MI/Directorate of Civil Defence	5,210.0	11,100.0
Ministry of Justice	550.0	7,968.0
Supreme Judge Department	15.0	2,478.0
Jordan Judicial Institute	20.0	237.0
Ministry of Foreign Affairs	1,600.0	17,334.0
MFA/Palestinian Affairs Department		453.0
Ministry of Finance	184,302.0	696,439.4
MF/General Budget Department	100.0	285.5
MF/Customs Department		6,017.0
MF/Income & Tax Department	210.0	4,831.0
MF/Department of Land & Surveys	599.0	4,386.0
MF/General Supplies Department	60.0	971.0
Ministry of Industry & Trade	55.0	1,285.3
Ministry of Planning/National Planning Council	83,406.0	810.0
MP/Department of Statistics	696.5	977.0
Ministry of Tourism & Antiquities Tourism	4,153.0	995.0
Ministry of Municipal, Rural Affairs & Environment	331.0	2,266.0
Ministry of Energy and Mineral Resources	571.5	753.6
MEMR/Natural Resources Authority	3,496.0	1,789.5
Ministry of Public Works & Housing	41,121.0	5,413.0
MPWH/Central Tender Department	68.0	289.0
Ministry of Agriculture	7,846.0	8,698.0
MA/Agricultural Marketing Corporation		471.5
Ministry of Water & Irrigation		199.0
MWI/Jordan Valley Authority	29,481.3	5,429.0
Ministry of Supply	485.0	1,429.5
Ministry of Education	12,500.0	203,185.0
Council of Higher Education	23.0	2,118.0
Ministry of Health	22,187.0	89,500.0
Ministry of Social Development	3,096.0	4,373.0
Ministry of Labor		1,091.0
Ministry of Information		625.0
MIf/Broadcasting & Television Corporation		
MIf/Jordan News Agency	55.0	896.3
MIf/Press & Public Department	29.0	483.0
Ministry of Youth	4,191.0	3,821.5
Ministry of Culture	369.0	1,791.0
MC/Department of National Library	20.0	267.0
Ministry of Tourism & Antiquities/Department of Antiquities	1,825.0	931.0
Ministry of Transport	307.0	346.0
MT/Civil Aviation Authority	4,200.0	7,487.0
MT/Meteorological Department	300.0	1,054.0
Ministry of Post & Communications	554.0	8,283.0
Total	437,675.6	#####

Source: Statistical Yearbook 1998

ANNEX to 1.3.3
Results of Socio-Economic
Interview Survey

Japan International Cooperation Agency (JICA) - Study Team

Socio-Economic Survey / Households
for the Study on Water Resources
Management in Jordan

Final Report
"Confidential"

Contents

	Page No.
Background	SA1-7
Objectives, Scope, Methodology & Approach	SA1-8
Sample Segmentation	SA1-1
Dwelling Characteristics	SA1-16
Water Usage	SA1-19
Frequency & Duration of Water Supply	SA1-21
Water Quality	SA1-23
Consumption Patterns	SA1-25
Household Expenditure on Water	SA1-26
Waste Water	SA1-28
Findings of Crosstabulation	SA1-30
Results of Coliforms Test	SA1-36
Major Conclusions	SA1-37
Appendices	SA1-41

Background

- || The Japan International Cooperation Agency (JICA) Study Team has commissioned MMIS Management Consultants to execute this Socio-Economic Survey of Households in Jordan as part of the "Study on Water Resources Management in Jordan" which was agreed upon between the Ministry of Water and Irrigation of Jordan and Japan International Cooperation Agency. The purpose of the survey is to obtain base data on water and waste water sectors as complementary information for the formulation of Water Resources Management Master Plan for the Kingdom of Jordan.

- || The survey was conducted during the month of June 2000, covering all the 12 governorates of Jordan, through direct field interviews with a pre-determined sample of 1000 households, distributed proportionally over the 12 governorates of the kingdom, taking into consideration the population size of each governorate and the various urban, rural, refugee camps and the Jordan Valley areas.

- || The tabulations, analysis, findings, conclusions and documentation of the field survey were completed at the end of July 2000.

Objectives, Scope, Methodology & Approach

Objectives & Scope

- || The overall objective of the survey is to obtain and develop the necessary base data on water and waste water matters in Jordan for the formulation of a "Water Resources Management Master Plan for Jordan".
- || The scope of the survey covers the following dimensions:
 - The following tables gives details of the (1000) households sample of the field survey as specified in the survey technical specifications:

Governorate	Urban	Rural	Refugee Camp	Jordan Valley	Total
Amman	300	33	50		383
Balqa	42	18		5	65
Zarqa	130	7	20		157
Madaba	15	10			25
Irbid	110	42	17	10	179
Mafrq	15	30			45
Jerash	15	9	5		29
Ajloun	15	7			22
Karak	14	21		5	40
Tafleh	12	4			16
Ma'an	8	11			19
Aqaba	17	3			20
Total	693	195	92	20	1000

* *The actual final number of the survey sample amounted to 1029 households with negligible deviations from the distribution in the above table.*

Objectives, Scope, Methodology & Approach (Cont'd)

Objectives & Scope (Cont'd)

The topics to be covered included:

- The prevalence of water and waste water services by governorate
- Dwelling characteristics
- Frequency of water supply to households
- Water quality
- Water consumption
- Waste water services
- Household expenditures on water and waste water services
- Customer satisfaction
- As part of the survey, coliforms test of drinking water was required to be done at one hundred and seventy (170) households using coliforms detection papers supplied by JICA Study Team. The water samples for the test to be collected directly at household water sources and water storage tanks.

Objectives, Scope, Methodology & Approach (Cont'd)

Methodology & Approach

- || MMIS survey group was made up of 4 separate field survey teams, each of which consisted of one senior supervisor and 3 interviewers. Each team was assigned a carefully selected group of geographical locations, within each governorate. The 4 field survey teams covered all the governorates as detailed in the table shown in the preceding objectives and scope section.
- || MMIS prepared all logistics for the survey like photo copying the questionnaire forms (Arabic version) provided by JICA Study Team; arranged the transportation matters of the survey teams, and insured clear and full understanding of the field survey team members of their tasks and requirements.
- || Upon the start of the field work (actual interviews), completed interviews / questionnaires were edited in the field as well as in the office on daily bases to insure validity of obtained data for tabulation. Defaulted questionnaires were corrected promptly in the field, and substituted with totally new interviews when necessary.
- || All collected data and information in the field survey questionnaires, including coliforms test results, were tabulated and illustrated in figures and tables utilizing SPSS computer software.
- || The resulting tables and figures, and cross tabulations were then analyzed and examined in the context of socio-economic and hygiene-sanitation conditions.

Objectives, Scope, Methodology & Approach (Cont'd)

Methodology & Approach (Cont'd)

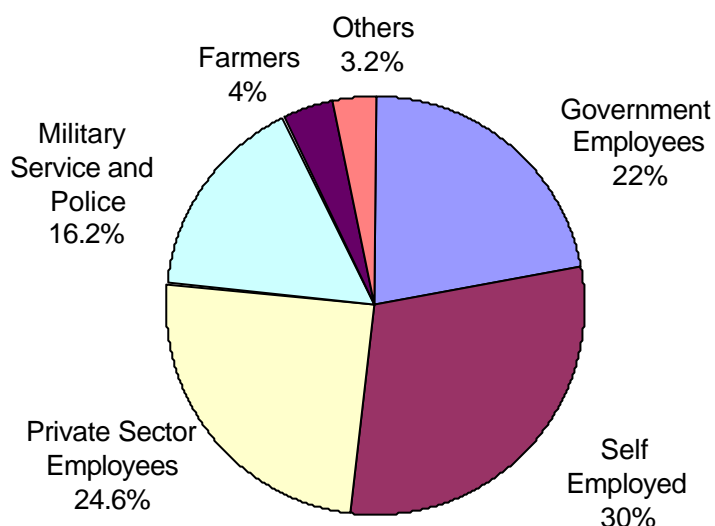
- || All obtained data and information including tables and figures, analysis, findings and conclusions were documented in a draft final report and presented to JICA's Study Team for review, discussion and feedback.

- || Finally, based on JICA's Study Team feedback and comments on the draft final report, MMIS prepared this final report of the survey.

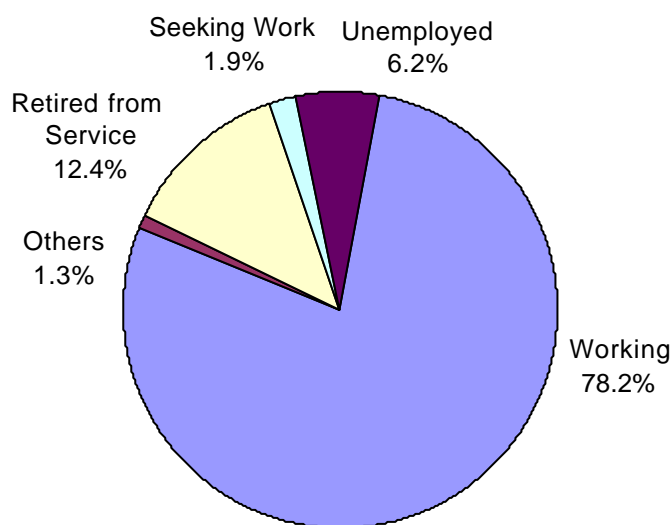
Note: The actual final number of the Coliforms tests in various household locations in the 12 governorates reached 257 taken in 225 households..

Sample Segmentation

|| The following chart shows the sample distribution in terms of occupation of household head:

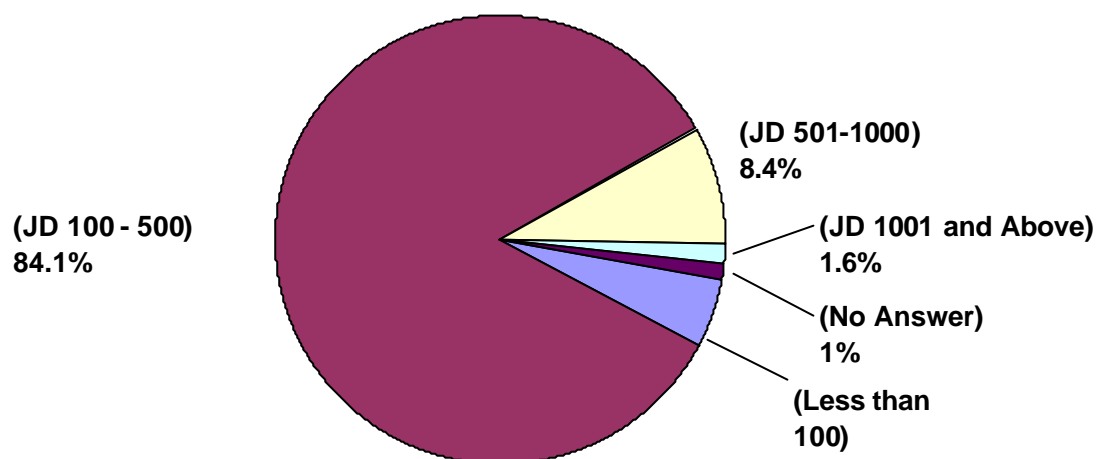


|| The following chart shows the sample distribution in terms of working status of household head:



Sample Segmentation (Cont'd)

|| The following chart shows the sample distribution in terms of monthly household income of all working household members.



Sample Segmentation (Cont'd)

|| Respondents composition of the sample households:

Relation to Household Head	% of all sample household members
Household Head	1.1
Spouse	39.7
Son/Daughter	52.8
Brother/Sister	5.9
Father/Mother	0.5

|| Age distribution of all members of the sample households:

Age Group	% of all sample household members
25 and below	27.7
26 - 35	55.5
36 - 45	10.1
46 - 55	4.1
56 and above	2.6

|| Sample distribution according to sex of all members of the sample households:

Sex	% of all sample household members
Male	42.3
Female	57.7

Sample Segmentation (Cont'd)

- || Sample distribution according to marital status of all members of sample households:

Marital Status	% of all sample household members
Married	12.9
Single	81.5
Divorced	4.6
Widow	1

- || Sample distribution according to education levels of all members of sample households:

Education Level	% of all sample household members
Less than Primary/ Elementary	10.3
Primary/Elementary	66.4
Secondary	18.3
Diploma	4.4
University degree	0.6

Dwelling Characteristics

|| Characteristics of sample household dwellings:

- Dwelling type of building:

Dwelling Type	%
Dressed Stone	17
Cement	6.1
Concrete Blocks	76.2
Cottage	7

- Dwelling size in sq.m:

Dwelling Size sq.m	%
100 and Less	40.2
101 - 200	54.2
201 - 300	4.8
301 - 400	0.8

- Dwelling number of rooms including kitchen and bathrooms:

Number of Rooms	%
2 - 5	44
6 - 10	54.3
11-15	1.5
16 and More	0.2

Dwelling Characteristics (Cont'd)

- || 98.1% of sample households have a running water source in their houses, of which:
 - 99.1% from WAJ water mains
 - 13.4% from a ground water well
 - 2.2% from other sources

- || Of the households that have water from other sources:
 - 90.5% buy water in tankers
 - 9.5% buy from other sources

- || 99.2% of sample households have water storage tanks, of which:
 - 95.8% located on the roof
 - 26.8% located on the ground
 - 0.9% located in other locations

- || Water tanks in the sample households are of the following various cu.m capacities:

Cu.m Capacity	% of sample households
1	22
2	35.2
3	11.8
4	10.2
5	2.9
6	4.5
7	1.4
8	3
9	8.6
Not known	0.4

Dwelling Characteristics (Cont'd)

- || 93.1% of the sample households that have water storage tanks claim that they clean their water tanks regularly, of which:
 - 18.1% clean the tanks once every 2 months.
 - 8.5% clean the tanks once every 3 months
 - 11.7% clean the tanks once every 4 months.
 - 24% clean the tanks once every 6 months.
 - 33.4% clean the tanks once every 12 months.
 - 2.5% other periods .
 - 1.8% don't Know.

- || 66% of the sample households think that water supplied by WAJ network is clean and can be used for drinking
- || 30.2% do not think it is good for drinking
- || 1.6% Don't know
- || 2.2% Not applicable

- || 12.8% of the sample households buy bottled water for drinking purposes, of which:
 - 55.3% buy bottled water regularly
 - 44.7% buy bottled water occasionally

- || Households that buy bottled water for drinking purposes spend the following amounts of money monthly:
 - 52.9% spend 10 JD or less.
 - 33.9% spend 11-20 JD.
 - 13.2% spend 21-60 JD.

- || Regarding water prices of the Water Authority of Jordan (WAT), the sample households were divided as follows:
 - 34.3% considered the prices of WAJ high.
 - 63% considered it acceptable.
 - 0.4% don't know
 - 2.3% not applicable.

Water Usage

|| Faucets inside Households:

No. of Faucets	% of sample households
0	0.1
1	1.9
2	12.7
3	34.4
4	23.6
5	12.8
6	7.3

No. of Faucets	% of sample households
7	3.4
8	2.2
9	0.5
10	0.6
11	----
12	0.3
13	0.1

|| No. of Faucets outside Households:

No. of Faucets	% of sample households
1	88.6
2	9
3	1.7
4	0.5
6	0.2

|| Bathing tops/basins indoor and outdoor households:

No. of bathing Tops/Basins Indoor	% of sample households
1	81.9
2	14.9
3	2.6
4	0.6

No. of bathing Tops/Basins Outdoor	% of sample households
1	0.6

Water Usage (Cont'd)

|| Toilets inside and outside households:

No. of Toilets Inside	% of sample households
1	66.2
2	28.4
3	4.9
4	0.4
5	0.1

No. of Toilets Outside	% of sample households
1	7

|| No. of Bedehs in households: Only 26% of the sample households have Bedehs. The number of bedehs in these households are as follows:

No. of Bedeh	% of sample households
1	77.2
2	14.2
3	7.5
4	1.1

|| 96% of sample households have washing machines

|| Only 1% of sample households have dish washers

|| 23.4% of sample households use the WAJ water for purposes other than drinking, house cleaning and personal washing. They use it as follows:

- 83.1% for watering the garden
- 26.4% for washing their cars
- 9.4% for other purposes

Frequency & Duration of Water Supply

|| Frequency of WAJ water supply to sample households:

- Daily and regularly 7.5% of sample households
- 3 times/week 9.8% of sample households
- 2 times/week 24.6% of sample households
- 1 time/week 49.6% of sample households
- 1 time every 2weeks 2.4% of sample households
- Don't reach at all 0.2% of sample households
- Other frequencies 3.3% of sample households
- Don't know 0.3% of sample households
- Not applicable 2.3% of sample households

|| Duration/hours of water supply each supply time:

- Less than 6 hours 2.6% of sample households
- 6-12 hours 7.3% of sample households
- 13-24 hours 36.3% of sample households
- 25-36 hours 7.1% of sample households
- 37-48 hours 23% of sample households
- More than 48 hours 22% of sample households
- Don't know 1.7% of sample households

|| 26.7% of sample households say that water supply duration is not enough for consumption during the period of water cut off. Means and methods used by sample households to cover the shortage of water during cut off are as follows:

- 28.5% reduce the water consumption during this period
- 54.4% buy water from tankers
- 4.3% added new tanks to reserve extra water
- 20.3% use other means and methods

Frequency & Duration of Water Supply (Cont'd)

|| Frequency of buying water from tankers in the period of water cut off among sample households:

Frequency of Buying from Tankers	%
Once a week	30.5
Twice a week	3.9
Once a month	42.2
Other periods	23.4

|| The various prices paid per 1 cubic meter of tanker water are:

(JD/CU.M)	% of sample households who buy water from tankers
0.5	3.9
1	30.5
1.5	27.3
2	24.7
More than 2	10.4
Don't Know	3.2

WATER QUALITY

- || 19.2% of the sample households boil water received from WAJ before drinking.
- || 50.8% feel that water must be boiled before drinking.
- || 11.1% usually filter the water before drinking.
- || A member or more of 7.4% of sample households experienced the following health problems after drinking/using water received from WAJ:

Kind of Problem	% of total who experienced problems
Stomach and intestinal pain	46.6
Diarrhea	47.2
Dryness of skin	5.6
Mouth and gum inflammation	6.9
Hair loss	4.2
Other health problems	34.7

- || Level of Chlorine in the WAJ water as felt by sample households:

Response	% of sample households
Very much and apparent	30.9
Very little	11.2
Suitable	52.6
Don't know	3.1
Not applicable	2.2

Water Quality (Cont'd)

|| Level of Satisfaction with WAJ water quality & services among sample households:

Quality / Service	Satisfied %	Dissatisfied %	Don't Know %	Not Applicable %
Color	68	31.7	0.3	-----
Purity	62.7	36.2	1.1	-----
Taste	59.7	39.8	0.5	-----
Potability	67.0	31.6	1.4	-----
Frequency of supply	69.6	28.3	2.1	-----
Duration of supply	69.5	28.3		2.2
WAJ response to complaints	36.4	20.4	41.0	2.2

Consumption Patterns

|| The sample households described their water consumption patterns as follows:

- 0.8% use much more water than they actually need
- 99.1% do not use more water than they actually need
- 0.1% don't know

- In 5% of the sample households household members leave water flowing when taking a bath or a shower.

- In 0.3% of the sample households water is left flowing continuously when washing dishes and other utensils.

- In 0.5% of the sample households members leave water flowing when shaving or brushing their teeth.

- In 2.3% of the sample households household members use a hose when washing their cars

- 99.3% of the sample households try to reduce consumption of water when cleaning the house and flushing toilets, ... etc.

Household Expenditure on Water

|| The average monthly expenditures of the sample households on water as a percentage of the total monthly household budget are as follows:

% of monthly budget	% of sample households
Less than 1%	32.5
Between 1-2%	42.5
Between 3-4%	15.2
Between 4-5%	3.5
More than 5%	5.4
Don't know	0.9

|| The acceptable monthly percentage of the total household budget that may be allocated for water:

% of monthly budget	% of sample households
Less than 1%	46.3
Between 1-2%	47
Between 2-5%	4.6
More than 5%	0.3
Don't know	1.7
Higher percentages	0.1

|| The sample households have expressed the following opinions regarding prices of WAJ water:

If water quality and quantity is improved by WAJ:

- 29.4% are ready to pay more for water above current prices.
- 67.6% not ready to pay more
- 0.8% don't know
- 2.2% not applicable

Household Expenditure on Water (Cont'd)

|| The sample households receive WAJ bills for their water consumption as follows:

- 93% every 3 months
- 0.6% every 4 months
- 0.3% every 6 months
- 2.4% irregularly
- 1.2% do not receive bills at all
- 2.5% not applicable

|| Average cost of water consumption per quarter in (JD)

Average Consumption cost per quarter (JD)	% of sample households	Average Consumption cost per quarter (JD)	% of sample households
Less than 5	27.5	31-50	4.5
5-8	25.8	51-70	1.3
9-10	11	71-100	0.8
11-15	12.4	More than 100	0.6
16-20	6.7	Don't know	0.4
21-30	6.7	Not applicable	2.3

|| The sample households willingness to pay more for improved water quality and quantity is distributed as follows:

- 68% are not willing to pay more
- 24.3% are willing to pay 1-5% over current prices
- 3% are willing to pay from 6-10% over current prices
- 2.4% are willing to pay more than 10% over current prices
- 2.3% not applicable

Waste Water

|| 35.8% of the sample households are not connected to the WAJ sewage system. All of them dispose of waste water in cesspits.

|| Frequency of emptying cesspits is as follows:

Cesspit Emptying Frequency	% of Cesspit Users
Once a month	14.1
Once every 2 months	9
Once every 3 months	8.5
Never	50.6
Other period	17.8

|| Cost of each time the cesspit is emptied:

Cost (JD)	% of Cesspit Users
Less than 20	94.4
21-30	1.7
31-40	0.6
41-50	2.3
Don't know	1.0

|| Sample households comments on sewage system problems and maintenance services :

- 11.1% have frequent blockage in the public sewage system at the mains near their household location
- 54.1% have no problems
- 0.9% Don't know
- 33.9% not applicable

Waste Water (Cont'd)

|| Rating of WAJ Response to problems in the sewage system according to sample households:

- 22.9% Immediate response /Good
- 29% Acceptable
- 35.9% Always late
- 12.2% Don't know

|| Rating of WAJ services and maintenance of the sewage system according to sample households:

- 24.2% Good
- 44.3% Acceptable
- 6.2% Insufficient
- 4.9% Bad and needs improvement
- 20.4% Don't know

|| The 11.1% unsatisfied households with WAJ services gave the following reasons for dissatisfaction:

- 5.3% Insufficient network
- 29.3% Lack of maintenance
- 7.7% Other reasons
- 62.3% No specific reasons

Findings of Crosstabulation

|| WAJ Water Supply:

- The majority of the sample households in all governorates receive water from WAJ network 1-2 times a week
 - In Karak, 2 to 3 times a week
 - In Aqaba, water reaches households on daily bases and sometime 3 times a week.
 - In Balqa, water reaches some households on daily bases, and 1 time a week to others.
- The majority of the sample households in all governorates are satisfied with WAJ and think that duration of water supply form WAJ is enough for household purposes during the period of water cut of regardless of the capacity of their tanks.
- The majority of household tanks are of 1-2 cubic meter capacity.
- The majority of households in all governorates buy water from tankers as the main source to cover the period of water cut off.

|| Level of Satisfaction with WAJ Water and Services:

- Color of water: the majority in all governorates are satisfied with the water color except in Maan where 70% are not satisfied.
- Purity of water: The majority in all governorates are satisfied except in Maan (80% are not satisfied).
- Taste of water: The majority in all governorates are satisfied, but in Irbid and Karak satisfaction regarding the taste of water is low (Irbid 51.6%), (Karak 51.1%). In Maan, 75%, are not satisfied.

Findings of Crosstabulation (Cont'd)

- Potability of WAJ Water: The majority in all governorates are satisfied except in Maan where 55% are not satisfied.
- Frequency of water supply and duration of supply: The majority in all governorates are satisfied with the lowest in Madaba (52% are not satisfied).
- WAJ response to complaints: The majority in all governorates are satisfied except in Maan and Madaba where 50% are satisfied. In Karak, 62.2% are not satisfied.

|| Expenditure on Water

- Average household expenditure on water consumption in each governorate are as follows:

Governorate	Expenditure on Water per Quarter JD
Amman	5-8
Zarqa	Less than 5
Irbid	5-8
Karak	5-8
Ma'an	11-15
Aqaba	11-15
Balqa	Less than 5
Madaba	5-8
Mafraq	Less than 5
Jerash	Less than 5
Ajloun	Less than 5
Tafeleh	11-15

Findings of Crosstabulation (Cont'd)

- Average expenditure on water as a percentage of total monthly budget of the household in Jordan is approximately 2%.
- For improved WAJ water quality and quantity, the vast majority of sample households are not willing to pay more. Only 29.4% are willing to pay between 1% and 10% over current prices.

|| Consumption Patterns:

The vast majority of households in all governorates do not leave water flowing unnecessarily for any reason or purpose, and therefore, the consumption of water, for all purposes, is being controlled to satisfy the household actual needs.

|| Waste Water

While 98.1% of the sample households are connected to the WAJ water network, only 64.2% of them are connected to the public sewage system. The remaining 35.8% that are not connected to the sewage system use cesspits to dispose of their wastewater.

Findings of Crosstabulation (Cont'd)

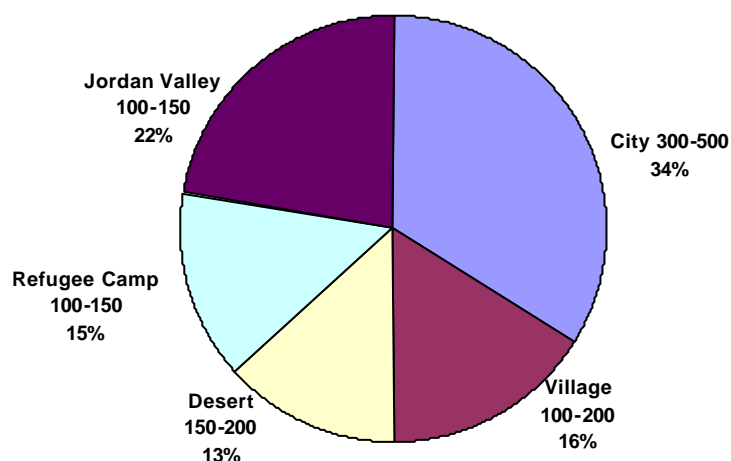
|| Average Family Size in the various locations of Dwellings:

Location	Number of members
City	5
Village	6
Refugee Camp	5
Desert	7
Jordan Valley	5

|| Educational levels in the various locations of Dwellings:

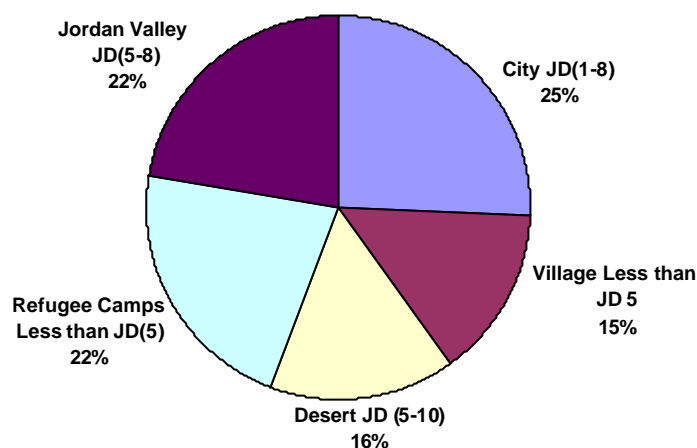
Location	% with Elementary Education
City	62.8
Village	72.2
Refugee Camp	81.5
Desert	77.5
Jordan Valley	55.5

|| Average Monthly Income of Household in the various locations of Dwellings:



Findings of Crosstabulation (Cont'd)

|| Expenditures on Water per quarter in the various locations of Dwellings:



|| Connection with WAJ Water Network in the various locations of Dwellings:

Locations	Yes	No
City	99.4	0.6
Village	97.2	2.8
Desert	100	-
Refugee Camp	98.9	1.1
Jordan Valley	100	-

|| Connection with Sewage System in the various locations of Dwellings:

Locations	Yes	No
City	81.3	13.7
Village	4.1	95.9
Desert	-	100
Refugee Camp	75	25
Jordan Valley	5.5	94.5

Findings of Crosstabulation (Cont'd)

- || Willingness to Pay More for improved WAJ quality and quantity in the various locations of Dwellings:

Location	Yes	No
City	34.6	65.4
Village	20.6	79.4
Desert	15.8	84.2
Refugee Camp	25.3	74.7
Jordan Valley	11.8	88.2

- || Educational Level related to Regular Cleaning of Water Storage Tanks:
- 90% of those with less than primary/ Elementary level of education clean their water tanks.
 - 93.7% of those with Primary/Elementary clean their water tanks.
 - 93.8% of those with Secondary level of education clean their water tanks.
 - 38.3% of those with Diploma level of education clean their water tanks.
 - 83.3% of those with University level of education clean their water tanks.

Results of Coliforms Tests

|| The following table summarizes the results of the 257 Coliforms tests that were taken during the households survey.

Governorate	Total Tests	WAJ Water		Storage Well		Other Storage (Tanks & Others)	
		With Coliforms	Without Coliforms	With Coliforms	Without Coliforms	With Coliforms	Without Coliforms
1. Amman	60	22	31	4	1	2	-
2. Zarka	34	10	24	-	-	-	-
3. Balqa	20	0	17	-	2	-	1
4. Irbid	69	18	28	11	7	5	-
5. Ajloun	5	0	4	-	-	1	-
6. Jerash	10	3	5	2	0	-	-
7. Mafrq	11	1	9	-	-	0	1
8. madaba	10	5	2	2	0	1	0
9. Tafeelah	5	4	1	-	-	-	-
10. Aqaba	10	6	4	-	-	-	-
11. Ma'an	9	6	2	-	-	0	1
12. Karak	14	9	5	-	-	-	-
Total Jordan	257	84	132	19	10	9	3

- In general, of all the coliforms tests (257) that were taken in the 12 governorates of the kingdom, 145 tests (56.4%) showed no Coliforms at all, while the other 112 tests (43.6%) did show Coliforms.
- Of the total number of WAJ's water tests (216), 132 (61%) indicated no Cofilorms at all, while the other 84 tests (39%) did show Coliforms to a varying degree.
- Of the 29 tests conducted on household water storage wells in 5 different governorates, namely Amman, Balqa, Irbid, Jerash and Madaba, 19 tests (65.5%) showed Coliforms while 10 tests (34.5%) indicated no Coliforms at all.
- Out of a total of 12 tests carried out on other household storage units, like metal and cement tanks, in seven governorates, namely Amman, Balqa, irbid, Ajloun, Mafrq, Madaba and Ma'an 9 (75%) indicated presence of Coliforms while 3 (25%) did not.
- In summery, the 257 Coliforms tests conducted in the 12 governorates of the kingdom clearly indicate that direct WAJ water is cleaner than all other household water sources with 65.5% ratio of Cofiliforms free water supply.

Major Conclusions

|| Cities

- The average family size in all Jordanian cities is 4-5 members, the majority of which have elementary level of education, with an average monthly income (of all working members of the household) of JD200-300. The cost of household water consumption range from JD1 to 8 per each quarter.
- The connection to the WAJ water network is the highest in cities (99.4%). Connection to the sewage system is also high (81.3% are connected to the sewage system and 18.7% are not). The majority of the not connected households use cesspits for wastewater.
- The vast majority of households in the cities are not ready to pay anything for improved water quality and quantity of the Water Authority. Only 34.5% are willing to pay 1-5% for improved water of the Water Authority in both quality and quantity.

|| Villages

- The average family size in the Jordanian villages is 5-6 members. The majority have elementary level of education, with an average monthly income (of all working members of the household) of JD100-200. Villages household expenditure on water consumption is less than JD5 per each quarter.
- 97.2% of households in villages are connected with the WAJ water network. On the other hand, only 4% are connected with the sewage system. The majority of those who are not connected to the sewage system use mainly cesspits for waste water.

Major Conclusions (Cont'd)

|| Villages (Cont'd)

- For improved water quality and quantity of the Water Authority, only 20.5% are willing to pay more (from 1 to 5% of current prices), and the majority (79.5%) are not willing to pay anything.

|| Desert

- 7 Members is the average family size in the Jordanian desert, which is the highest average size of family. The majority of desert dwellers have elementary level of education, with an average monthly household income (of all working members) of JD200-250. The Jordanian Desert dwellers average expenditure of the household on water consumption is JD5-8 per each quarter.
- 95% of desert households are connected to the main network of the Water Authority, while non of them is connected to the sewage system.
- Only 15.7% of desert households are willing to pay more (1-5%) for improved water of the Water Authority, in both quality and quantity. But 84.3% are not willing to pay anything.

|| Refugee Camps

- The average family size in the Refugee Camps is 5-6 members, the majority of which have elementary level of education, with average monthly household income (of all family members) of JD 100-150. The average household expenditure on water in the refugee camps per quarter is less than JD5.

Major Conclusions (Cont'd)

|| Refugee Camps (Cont'd)

- 98.9% of households are connected to the main network of the Water Authority, while the majority of them are not connected to the sewage system (only 25.7% are connected with the sewage system, and 74.3% are not). Most of those who are not connected with the sewage system use cesspits for wastewater.
- 74.7% of households are not willing to pay more for improved water service of the water authority. Only 25.3% are willing to pay (1-5%) more for improved water in quality and quantity.

|| Jordan Valley

- The average family size in the Jordan Valley is 5 members. The majority have elementary level of education with an average monthly income (of all family members) of JD100-150. The household average expenditure on water is JD5-8 per quarter.
- 100% of the household sample in the Jordan Valley are connected to the main water network of the Jordan Water Authority. Only 55% are connected to the sewage system, and those who are not connected with the sewage system use cesspits for wastewater.
- 11.7% of the household sample in the Jordan valley are willing to pay more for improved water of the Water Authority in both quality and quantity, while the majority of them (88.3%) are not willing to pay anything.
- 86.9% of the household members in the Valley that felt sick after drinking water received from the Water Authority do not clean their water tanks at all.

Major Conclusions (Cont'd)

|| Jordan Valley (Cont'd)

- Only 6.1% of the household members that felt sick do clean their water tanks periodically. This shows that there is a close link between cleaning the water tanks and the high percentage of those that felt sick after drinking WAJ water.
- It is important to mention here that overall satisfaction with water color, purity, taste and potability of water received from the Water Authority constitute the majority (64.3%).

|| General / Jordan

- While the vast majority of Jordanian households are connected to the main water network of the Water Authority, (99.1%) only 64.2 are connected with the sewage system.
- 64.7% of Jordanian households are connected to both the main water network of the Water Authority and the sewage system. The majority of those who are connected to both services are mainly in the cities and the Refugee Camps.
- 34.4% of the households sample are connected only to the main water network and not to the sewage system. The majority of them are in Villages, Desert and the Jordan Valley.
- 0.4% of the households sample are not connected to neither the main water network nor to the sewage system.
- 0.5% of the sample are connected to the sewage system only and not connected with the WAJ water network.

Survey Questionnaire Form

ANNEX to 1.5.1
Municipal Water

شركة دار الخبرة للإستشارات الإدارية
(MMIS)

المملكة الأردنية الهاشمية
وزارة المياه والري
سلطة المياه وفريق الوكالة اليابانية للتعاون الدولي
(جايكا)

استبيان			
دراسة إدارة مصادر المياه في الأردن الدراسة الاقتصادية والاجتماعية للأسرة			
			رقم الإستمارة :
	()		المحافظة :
	()		إسم التجمع (المنطقة) :
دليل التجمع :			
	1	سجل بالتحديد :	المدينة :
	2	سجل بالتحديد :	القرية :
	3	سجل بالتحديد :	المخيم :
	4	سجل بالتحديد :	وادي الأردن :
2000 / /	تاريخ المقابلة		إسم المراقب
			إسم الباحث
2000 / /	تاريخ التدقيق		إسم المدقق

المعلومات العامة

- (1) إسم رب الأسرة : _____
- (2) مهنة رب الأسرة (بالتفصيل) : _____
- (3) الحالة العملية :
- | | | | | | |
|---|-------------------|---|---|---|-----------------------------------|
| 4 | يعمل لحسابه الخاص | - | 1 | - | موظف حكومة |
| 5 | مزارع | - | 2 | - | موظف في الخدمة العسكرية أو الشرطة |
| 6 | غيرها (حدد) | - | 3 | - | موظف قطاع خاص |
- (3) الحالة العملية :
- | | | | | | |
|---|-------------------|---|---|---|-------------------------------|
| 4 | متقاعد من الخدمة | - | 1 | - | يعمل حالياً |
| 5 | غيرها (حدد) | - | 2 | - | عاطل عن العمل ويبحث عن عمل |
| | | | 3 | - | عاطل عن العمل ولا يبحث عن عمل |
- (4) إجمالي الدخل الشهري للأسرة بما في ذلك جميع العاملين من أفراد الأسرة :
- | | | | | | |
|----|----------------------------|---|----|---|---------------------------|
| 07 | من 501 - 800 دينار شهرياً | - | 01 | - | أقل من 100 دينار شهرياً |
| 08 | من 801 - 1000 دينار شهرياً | - | 02 | - | من 100 - 150 دينار شهرياً |
| 09 | 1000 فما فوق | - | 03 | - | من 151 - 200 دينار شهرياً |
| 10 | غير مبين / غير محدد | - | 04 | - | من 201 - 250 دينار شهرياً |
| 11 | رفض الإجابة | - | 05 | - | من 251 - 300 دينار شهرياً |
| | | | 06 | - | من 301 - 500 دينار شهرياً |
- (5) تركيب الأسرة : (سجل عدد أفراد الأسرة تنازلياً ابتداءً من رب الأسرة)

عدد أفراد الأسرة الذين يسكنون هذا المنزل بشكل دائم :

الرقم	الإسم	العلاقة برب الأسرة	العمر	الجنس	الحالة الاجتماعية	التعليم
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

لاستعمال المكتب :

الجنس :	ذكور (1)	أنثى (2)
العمر بالسنوات :	صفر للعمر أقل من سنه (0)	
العلاقة برب الأسرة :	رب الأسرة (0)	زوج/زوجة (1)
	أخ/أخت (3)	أب/أم (4)
الحالة الاجتماعية :	متزوج (1)	أعزب (2)
		مطلق (3)
		أرملة (4)
التعليم :	أسي/مك (1)	أتم الابتدائي/أتم الإعدادي (2)
	أتم معهد/دبلوم متوسط (4)	أتم الثانوية (3)
		أتم جامعة فما فوق (5)

(6) خصائص المسكن / المياه

- (601) نوع مادة بناء المسكن (السكن) :
- | | | |
|---|---|---|
| 1 | - | بناء حجر |
| 2 | - | بناء إسمنت |
| 3 | - | طوب إسمنتي |
| 4 | - | كوخ / براكية (بناء مسقوف بمواد غير إسمنتية) |
| 5 | - | خيمة / بيت شعر |
| 6 | - | غيرها (حدد) |
- (602) مساحة المسكن بالأمتار المربعة (تقريباً) :
- (603) عدد الغرف بما في ذلك المطبخ والحمام :
- (604) هل يوجد مصدر للمياه الجارية داخل البيت ؟
- | | | |
|---|---|-----|
| 1 | - | نعم |
| 2 | - | لا |
- (605) ما هو مصدر المياه لمنزلك ؟
(مسموح أكثر من إجابة)
- | | | |
|---|---|------------------------------|
| 1 | - | الشبكة الرئيسية لسلطة المياه |
| 2 | - | بئر عادي |
| 3 | - | بئر ارتوازي |
| 4 | - | مصادر أخرى (حدد) |
- (606) ما هي الوسيلة التي تتبعها الأسرة للحصول على المياه للإستخدام المنزلي ؟
- | | | |
|---|---|--|
| 1 | - | من الجيران |
| 2 | - | شراء المياه بواسطة التتكات |
| 3 | - | إحضار المياه بواسطة أفراد الأسرة من مصدر آخر |
| 4 | - | مصادر أخرى (حدد) |
- (607) هل يوجد خزانات ماء (تتكات) في هذا المنزل ؟
- | | | |
|---|---|---------|
| 1 | - | نعم |
| 2 | - | لا |
| 3 | - | لا أعرف |
- (608) أين توجد هذه الخزانات ؟
(مسموح أكثر من إجابة)
- | | | |
|---|---|----------------------|
| 1 | - | على السطح |
| 2 | - | على الأرض |
| 3 | - | مكان آخر (حدد) |
- (609) ما هو مجموع سعة الخزانات الخاصة بهذا المنزل ؟
- | | | | | | |
|----|---|------------------|----|---|-------------|
| 06 | - | سته أمتار | 01 | - | 1 متر مكعب |
| 07 | - | سبعة أمتار | 02 | - | متران |
| 08 | - | ثمانية أمتار | 03 | - | ثلاثة أمتار |
| 09 | - | تسعة أمتار وأكثر | 04 | - | أربعة أمتار |
| 10 | - | لا أعرف | 05 | - | خمسة أمتار |

(610) تعلمون أن خزانات المياه يمكن أن تتلوث بمرور الزمن إذا لم يتم تنظيفها بشكل دوري، فهل تقومون بتنظيف خزانات المياه الخاصة بالمنزل ؟

	1	-	نعم
	2	-	لا
	3	-	لا أعرف

(أسأل س 611)
(إنتقل الى س 612)
(إنتقل الى س 612)

(611) هل تقومون بتنظيف الخزانات ؟

	1	-	مرة واحدة كل شهرين
4	1	-	مرة كل ستة أشهر
5	2	-	مرة كل سنة
6	3	-	لا أعرف

(612) هل تعتقد أن المياه الواردة الى المنزل من الشبكة الرئيسية نظيفة وصالحة للشرب ؟

	1	-	نعم
	2	-	لا
	3	-	لا أعرف
	4	-	لا ينطبق

(613) هل تقوم الأسرة بشراء المياه للمعياه في زجاجات ، او المصنعة والمعياه في أوعية بلاستيكية (مياه معدنية) ؟

	1	-	نعم
	2	-	لا

(أسأل 614)
(إنتقل الى س 616)

(614) هل تشتري الأسرة المياه المعياه في زجاجات او أوعية بلاستيكية ؟

	1	-	بانتظام
	2	-	أحيانا

(أسأل 615)
(إنتقل الى س 616)

(615) إذا كانت الأسرة تشتري للمياه المعياه بانتظام او على فترات متقطعة، فكم تدفع الأسرة شهريا " ثمننا " لهذه المياه ؟

دينار شهريا _____

(616) هل تعتقد ان ثمن المياه حسب تعرفه سلطة المياه ؟

	1	-	مرتفعة
	2	-	مقبولة وواقعية
	3	-	لا أعرف
	4	-	لا ينطبق

(7) إستخدامات المياه

- (701) كم عدد الحنفيات الموجودة :
 (A) داخل المنزل
 (B) خارج المنزل:

- (702) هل يوجد في المنزل غسالة كهربائية ؟
 - نعم 1
 - لا 2
- (703) هل يوجد في المنزل جلاية صحون كهربائية ؟
 - نعم 1
 - لا 2
- (704) كم عدد الحمامات في المنزل (شور أو دوش) ؟
 (A) داخل المنزل
 (B) خارج المنزل:

- (705A) كم عدد المراحيض في المنزل ؟
 (A) داخل المنزل
 (B) خارج المنزل:

- (705B) كم عدد الشطافات (البيديه) في المنزل ؟

- (706) هل تستعمل المياه في منزلك لغير أغراض الشرب ونظافة المنزل والإستعمال الذاتي ؟
 - نعم 1 (أسأل 707)
 - لا 2 (إنتقل الى س 708)
- (707) هل تستخدم المياه لـ ؟
 - لري الحديقة 1
 - لغسل السيارة 2
 - لبركة السباحة 3
 - لأغراض أخرى (حدد) 4
 - 5
- (708) كم مره في الأسبوع تصلكم المياه من الشبكة الرئيسية حاليا ؟
 - يوميا" و بانتظام 1
 - ثلاث مرات في الأسبوع 2
 - مرتين في الأسبوع 3
 - مرة واحدة في الأسبوع 4
 - مرة واحدة كل اسبوعين 5
 - لا تصل ابدا" 6
 - غيرها (حدد) 7
 - لا اعرف 8
 - لا ينطبق 9 (انتقل الى س 711)

- (709) عندما تصل المياه الى المنزل ، فكم ساعة في تقديركم تكون مدة ضخ المياه في المرة الواحدة ؟
- | | | | | | |
|---|---|-----------------|---|---|-----------------|
| 5 | - | أقل من 6 ساعات | 1 | - | من 37 - 48 ساعة |
| 6 | - | من 6 - 12 ساعة | 2 | - | أكثر من 48 ساعة |
| 7 | - | من 13 - 24 ساعة | 3 | - | لا أعرف |
| | - | من 25 - 36 ساعة | 4 | | |
- (710) هل تعتقد أن مدة الضخ كافية لإيصال كمية من المياه تفي بإحتياجات الأسرة خلال مدة إنقطاع الضخ ؟
- | | | | | |
|--|---|---------|---|-------------------|
| | - | نعم | 1 | (إنتقل الى 801) |
| | - | لا | 2 | (اسأل 711) |
| | - | لا أعرف | 3 | (اسأل 711) |
- (711) إذا كانت مدة الضخ غير كافية لتزويد الأسرة بإحتياجاتها من المياه ، أو إنكم غير مشتركين مع السلطة فما هو العمل الذي تقوم به الأسرة لتوفير هذه المياه؟
- (لا تقرأ الإجابات) (مسموح أكثر من إجابة) :
- | | | | | |
|--|---|---|---|-------------------|
| | - | تخفيض كمية الأستهلاك الى الكمية الموجودة | 1 | (إنتقل الى 801) |
| | - | تشتري الكمية المطلوبة من الموزعين بالصهاريج | 2 | (إنتقل الى 712) |
| | - | أو التتكات من القطاع الخاص | 3 | (إنتقل الى 801) |
| | - | تضيف خزانات جديدة الى العدد الموجود | 4 | (إنتقل الى 801) |
| | - | إتباع وسائل أخرى (حدد) | | |
- (712) كم مرة تقوم الأسرة بشراء المياه بواسطة التتكات ؟
- | | | |
|---|---|------------------|
| 1 | - | مرة في الأسبوع |
| 2 | - | مرتين في الأسبوع |
| 3 | - | مرة واحدة كل شهر |
| 4 | - | غيرها (حدد)..... |
- (713) كم تدفع الأسرة ثمناً " للتر المكعب الواحد من المياه المشتراه بواسطة التتكات ؟
- | | | |
|---|---|-----------------------------|
| 1 | - | نصف دينار |
| 2 | - | دينار واحد |
| 3 | - | دينار ونصف |
| 4 | - | دينارين |
| 5 | - | أكثر من دينارين (حدد) |
| 6 | - | لا أعرف |

نوعية المياه (8)

- 801 هل تقوم الأسرة بغلي الماء قبل استعماله للشرب أو الطبخ ؟
- | | | |
|---|---------|---|
| 1 | نعم | - |
| 2 | لا | - |
| 3 | لا أعرف | - |
- 802 هل تعتقد انه من الضروري غلي الماء قبل شربه ؟
- | | | |
|---|---------|---|
| 1 | نعم | - |
| 2 | لا | - |
| 3 | لا أعرف | - |
- 803 هل تقوم الأسرة باستعمال الفلتر لتنقية الماء قبل شربه ؟
- | | | |
|---|-----|---|
| 1 | نعم | - |
| 2 | لا | - |
- 804 هل شعر أي من أفراد الأسرة بأي عوارض صحي نتيجة لتناول مياه الشرب من أي مصدر كان خلال الشهر الماضي ؟
- | | | |
|---|-----|---|
| 1 | نعم | - |
| 2 | لا | - |
- (اسأل 805)
(إنتقل الى س 806)
- 805 ماذا كانت طبيعة هذا العارض الصحي ؟
(لا تقرا) (مسموح أكثر من إجابة) :
- | | | |
|---|-------------------------|---|
| 1 | الأم في المعدة والأمعاء | - |
| 2 | اسهال | - |
| 3 | جفاف في الجلد | - |
| 4 | التهاب في الفم واللثة | - |
| 5 | نساقط الشعر | - |
| 6 | التهاب في العين | - |
| 7 | أمراض أخرى(حدد): | - |
- 806 تقوم سلطنة المياه بإضافة مادة الكلور لتعقيم المياه، وقد تحدث هذه المادة تغيراً في طعم الماء، فهل ترى أن كمية الكلور في الماء؟
- | | | |
|---|--------------------|---|
| 1 | كثيرة جداً" وظاهرة | - |
| 2 | قليلة جداً" | - |
| 3 | مناسبة | - |
| 4 | لا أعرف | - |
| 5 | لا ينطبق | - |

(807) ما مدى رضاكم عن المياه التي تصلكم بالنسبة لـ.....؟

السؤال	راضٍ	غير راضٍ	لا أعرف	لا ينطبق
A لون الماء	1	2	3	----
B نقاء الماء من الشوائب	1	2	3	----
C طعم الماء	1	2	3	----
D قابليته للشرب / صلاحة للشرب	1	2	3	----
E تكرار الضخ / عدد مرات الضخ	1	2	3	4
F مدة الضخ / ساعات الضخ	1	2	3	4
G إستجابة السلطة للشكاوي	1	2	3	4

(808) يتعلق هذا السؤال بتجاهات الأسرة في استعمالات المياه :

السؤال	نعم	لا	لا أعرف
A هل تعتقدون أن استعمالك للمياه أكثر من اللازم؟	1	2	3
B هل يترك أفراد الأسرة الحنفية أو الدوش مفتوحاً أثناء الاستحمام؟	1	2	3
C هل يترك أحد أفراد الأسرة الحنفية مفتوحة أثناء الحلاقة؟	1	2	3
D هل تترك الحنفية مفتوحة أثناء غسل الأطباق والأواني؟	1	2	3
E هل تستخدم البريش أثناء غسل السيارة؟	1	2	3
F هل تحاول الأسرة بأي صورة الحد من استهلاك المياه وبخاصة في غسل البيت والحمامات؟	1	2	3

(9) اتفاق الأسرة على الميساه

				(901) ما هو متوسط اتفاق الأسرة على المياه شهرياً كنسبة من ميزانية الأسرة ؟
4	من 4 - 5%	-	1	أقل من 1%
5	5% فأكثر	-	2	من 1 - 2%
6	لا أعرف	-	3	من 3 - 4%

				(902) ما هي في رأيك النسبة المعقولة التي يجب أن تدفعها الأسرة شهرياً من دخلها كتمن لإستهلاك المياه ؟
4	أكثر من 5%	-	1	أقل من 1%
5	لا أعرف	-	2	من 1 - 2%
			3	من 3 - 4%

				(903) إذا قامت السلطة بتحسين نوعية وكمية المياه في الأردن فهل تعتقد انه من الواجب رفع تسعيرة المياه ؟
			1	نعم
			2	لا
			3	لا أعرف
			4	لا ينطبق

				(904) هل تصلكم فواتير المياه بانتظام ؟
			1	مرة كل ثلاثة اشهر
			2	مرة كل أربعة اشهر
			3	مرة كل ستة اشهر
			4	ليس لها موعد محدد
			5	لا تصل ابداً
			6	لا ينطبق

				(905) كم دفعت الأسرة ثمناً للمياه خلال الدورة الأخيرة ؟
07	من 31 - 50 دينار	-	01	أقل من 5 دنانير
08	من 51 - 70 دينار	-	02	من 5 - 8 دنانير
09	من 71 - 100 دينار	-	03	من 9 - 10 دنانير
10	أكثر من 100 دينار	-	04	من 11 - 15 دينار
11	لا أعرف	-	05	من 16 - 20 دينار
12	لا ينطبق	-	06	من 21 - 30 دينار

				(906) إذا قامت سلطة المياه بتحسين نوعية وكمية المياه في الأردن فما هي النسبة المعقولة المتوقعة والتي تقبلها الأسرة للزيادة على تعرفه المياه (فاتورة المياه) ؟
			1	لا شيء
			2	من 1 - 5%
			3	من 6 - 10%
			4	أكثر من 10%
			5	لا ينطبق

(10) الصرف الصحي

- 1001 هل هذا المبنى / المنزل مربوط بشبكة الصرف الصحي ؟
 - نعم 1 (إنتقل الى س 1005)
 - لا 2 (اسأل 1002)
- 1002 أين يتم تصريف المجاري ؟
 - الى حفرة إمتصاصيه خارج المنزل (اسأل 1003) 1
 - الى الشارع أو الطريق العام (إنتقل الى س 1005) 2
 - الى وادي قريب من المنزل (إنتقل الى س 1005) 3
 - الى أماكن أخرى (حدد) (إنتقل الى س 1005) 4
- 1003 متى يتم تفريغ الحفرة الأمتصاصية ؟
 - مرة واحدة في الشهر 1
 - مرة كل شهرين 2
 - مرة كل ثلاثة أشهر 3
 - لا يتم تفريغها ابداً (إنتقل الى س 1005) 4
 - غيرها (حدد) 5
- 1004 كم تدفع الأسرة في كل مرة يتم فيها تفريغ الحفرة الأمتصاصية ؟
 - 20 دينار فأقل 1
 - من 21 - 30 دينار 2
 - من 31 - 40 دينار 3
 - من 41 - 50 دينار 4
 - أكثر من 50 دينار 5
 - لا أعرف 6
- 1005 هل يحدث إزداد بشكل متكرر في المجاري العامة في المناطق القريبة من هذا البناء أو المنزل حالياً ؟
 - نعم 1
 - لا 2 (إنتقل الى س 1007)
 - لا أعرف 3
 - لا ينطبق (انتهى المقابلة) 4
- 1006 هل تقوم السلطة بالاستجابة لإصلاح الضرر حالياً ؟
 - فوراً 1
 - في وقت مقبول 2
 - تتأخر دائماً 3
 - لا أعرف 4
- 1007 هل تعتقد بأن خدمات السلطة بالنسبة للمجاري ؟
 - جيدة 1 (انتهى المقابلة)
 - مقبولة 2 (انتهى المقابلة)
 - غير كافية 3 (اسأل 1008)
 - سيئة وتحتاج لتحسين 4 (اسأل 1008)
 - لا أعرف 5 (اسأل 1008)
- 1008 اذا كانت خدمة المجاري غير مقبولة أو سيئة فهل السبب في ذلك :
 - عدم كفاية الشبكات 1
 - عدم صيانة الشبكات 2
 - أسباب أخرى (حدد) 3
 - لا أعرف 4

الى الباحث : اشكر المستفتي على تعاونه .

Table 1.5.1-4 Projection of Per Capita Per Day Municipal Water Demand by Scenario, by Governorate and by Target Year

Item	AM	ZA	MF	IR	AJ	JE	BA	MA	KA	MN	TA	AQ	Jordan
Basic Values													
1998	96.0	92.0	203.0	73.0	69.0	66.0	123.0	210.0	99.0	152.0	63.0	239.0	102.0
2005	97.9	95.2	170.9	82.2	79.5	77.5	116.3	175.6	100.0	136.1	75.4	195.4	102.0
2010	99.3	97.5	147.9	88.8	87.0	85.6	111.5	151.1	100.6	124.7	84.3	164.3	102.0
2015	100.6	99.7	125.0	95.4	94.5	93.8	106.8	126.5	101.3	113.4	93.1	133.1	102.0
2020	102.0	102.0	102.0	102.0	102.0	102.0	102.0	102.0	102.0	102.0	102.0	102.0	102.0
Scenario 1													
1998	96.0	92.0	203.0	73.0	69.0	66.0	123.0	210.0	99.0	152.0	63.0	239.0	102.0
2005	96.9	94.2	169.2	81.4	78.7	76.7	115.2	173.9	99.0	134.8	74.7	193.5	101.0
2010	120.7	118.5	179.8	108.0	105.8	104.1	135.6	183.7	122.3	151.6	102.4	199.7	124.0
2015	128.3	127.1	159.3	121.6	120.4	119.6	136.1	161.3	129.1	144.5	118.7	169.7	130.0
2020	128.0	128.0	128.0	128.0	128.0	128.0	128.0	128.0	128.0	128.0	128.0	128.0	128.0
Scenario 2													
1998	96.0	92.0	203.0	73.0	69.0	66.0	123.0	210.0	99.0	152.0	63.0	239.0	102.0
2005	96.9	94.2	169.2	81.4	78.7	76.7	115.2	173.9	99.0	134.8	74.7	193.5	101.0
2010	120.7	118.5	179.8	108.0	105.8	104.1	135.6	183.7	122.3	151.6	102.4	199.7	124.0
2015	142.1	140.8	176.4	134.7	133.4	132.4	150.7	178.7	143.0	160.0	131.5	188.0	144.0
2020	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0
Scenario 3													
1998	96.0	92.0	203.0	73.0	69.0	66.0	123.0	210.0	99.0	152.0	63.0	239.0	102.0
2005	96.9	94.2	169.2	81.4	78.7	76.7	115.2	173.9	99.0	134.8	74.7	193.5	101.0
2010	120.7	118.5	179.8	108.0	105.8	104.1	135.6	183.7	122.3	151.6	102.4	199.7	124.0
2015	142.1	140.8	176.4	134.7	133.4	132.4	150.7	178.7	143.0	160.0	131.5	188.0	144.0
2020	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0	150.0

Note: Physical losses are not included.

Table 1.5.1-5 Projection of Municipal Water Demand by Scenario, by Governorate and by Target Year (MCM)

MUNICIPAL_Sc.1	2005			2010			2015			2020		
	net	losses 20%	sum	net	losses 15%	sum	net	losses 15%	sum	net	losses 15%	sum
AM	79.95	19.99	99.94	116.19	20.50	136.69	142.78	25.20	167.98	163.03	28.77	191.80
ZA	30.80	7.70	38.50	45.21	7.98	53.19	56.06	9.89	65.95	64.62	11.40	76.02
MF	14.99	3.75	18.74	18.60	3.28	21.88	19.12	3.37	22.49	17.66	3.12	20.77
IR	31.62	7.90	39.52	48.98	8.64	57.63	63.76	11.25	75.01	76.81	13.56	90.37
AJ	4.18	1.04	5.22	6.55	1.16	7.71	8.63	1.52	10.15	10.50	1.85	12.35
JA	4.91	1.23	6.14	7.79	1.37	9.16	10.34	1.83	12.17	12.67	2.24	14.90
BA	16.60	4.15	20.75	22.81	4.03	26.84	26.47	4.67	31.14	28.50	5.03	33.52
MA	9.03	2.26	11.29	11.14	1.97	13.11	11.34	2.00	13.34	10.33	1.82	12.16
KA	8.69	2.17	10.87	12.55	2.21	14.77	15.32	2.70	18.02	17.38	3.07	20.45
MN	5.66	1.42	7.08	7.44	1.31	8.76	8.20	1.45	9.65	8.35	1.47	9.82
TA	2.59	0.65	3.24	4.15	0.73	4.89	5.57	0.98	6.55	6.87	1.21	8.08
AQ	9.10	2.27	11.37	10.96	1.93	12.90	10.77	1.90	12.67	9.36	1.65	11.01
Total:	218.14	54.53	272.67	312.38	55.13	367.51	378.35	66.77	445.12	426.07	75.19	501.26
MUNICIPAL_Sc.2	net	losses 20%	sum	net	losses 15%	sum	net	losses 15%	sum	net	losses 15%	sum
AM	79.95	19.99	99.94	116.28	20.52	136.80	158.26	27.93	186.19	191.21	33.74	224.95
ZA	30.80	7.70	38.50	45.21	7.98	53.19	62.11	10.96	73.07	75.73	13.36	89.09
MF	14.99	3.75	18.74	18.60	3.28	21.88	21.09	3.72	24.82	20.60	3.64	24.24
IR	31.62	7.90	39.52	48.98	8.64	57.63	70.63	12.46	83.09	90.01	15.88	105.90
AJ	4.18	1.04	5.22	6.55	1.16	7.71	9.55	1.69	11.24	12.30	2.17	14.47
JA	4.91	1.23	6.14	7.79	1.37	9.16	11.45	2.02	13.47	14.85	2.62	17.47
BA	16.60	4.15	20.75	22.81	4.03	26.84	29.31	5.17	34.48	33.39	5.89	39.29
MA	9.03	2.26	11.29	11.14	1.97	13.11	12.53	2.21	14.74	12.10	2.13	14.23
KA	8.69	2.17	10.87	12.55	2.21	14.77	16.96	2.99	19.96	20.36	3.59	23.96
MN	5.66	1.42	7.08	7.44	1.31	8.76	9.08	1.60	10.68	9.74	1.72	11.46
TA	2.59	0.65	3.24	4.15	0.73	4.89	6.16	1.09	7.25	8.04	1.42	9.46
AQ	9.10	2.27	11.37	10.96	1.93	12.90	11.98	2.11	14.09	10.95	1.93	12.89
Total:	218.14	54.53	272.67	312.48	55.14	367.62	419.11	73.96	493.07	499.29	88.11	587.40
MUNICIPAL_Sc.3	net	losses 20%	sum	net	losses 15%	sum	net	losses 15%	sum	net	losses 15%	sum
AM	76.34	19.08	95.42	107.75	19.01	126.77	142.31	25.11	167.43	166.03	29.30	195.33
ZA	29.41	7.35	36.77	41.89	7.39	49.28	55.85	9.86	65.70	65.76	11.60	77.36
MF	14.32	3.58	17.89	17.23	3.04	20.27	18.97	3.35	22.32	17.89	3.16	21.05
IR	30.19	7.55	37.74	45.39	8.01	53.40	63.51	11.21	74.72	78.16	13.79	91.95
AJ	3.99	1.00	4.99	6.07	1.07	7.14	8.59	1.52	10.11	10.68	1.88	12.56
JA	4.69	1.17	5.86	7.22	1.27	8.49	10.30	1.82	12.11	12.89	2.27	15.17
BA	15.85	3.96	19.81	21.14	3.73	24.87	26.36	4.65	31.01	29.00	5.12	34.11
MA	8.63	2.16	10.78	10.33	1.82	12.15	11.27	1.99	13.26	10.50	1.85	12.36
KA	8.30	2.08	10.38	11.63	2.05	13.68	15.25	2.69	17.95	17.68	3.12	20.80
MN	5.41	1.35	6.76	6.90	1.22	8.11	8.16	1.44	9.61	8.46	1.49	9.95
TA	2.48	0.62	3.09	3.85	0.68	4.53	5.54	0.98	6.52	6.98	1.23	8.22
AQ	8.69	2.17	10.86	10.16	1.79	11.95	10.77	1.90	12.67	9.51	1.68	11.19
Total:	208.29	52.07	260.36	289.55	51.10	340.65	376.88	66.51	443.39	433.54	76.51	510.05

ANNEX to 1.5.2
Industrial Water

Questionnaires for Industrial Water Demand Projection

Name of the Company/Organization: _____

Address _____

Date of Establishment _____

Date of reply _____

Person of reply, his position and telephone no.

1. Current state of water use
 (Please answer for each production facility using separate sheet, if there are plural facilities in the Company/Organization.)

a. Outline of the facility

Main Product	Annual production capacity	Unit of capacity
1)		
2)		
3)		
4)		

b. Monthly variation in production

Is there any monthly variation in operation of the production facility?

Yes and they are;

Month	Monthly production	Month	Monthly Production
Jan.		Jul.	
Feb.		Aug.	
Mar.		Sep.	
Apr.		Oct.	
May		Nov.	
Jun.		Dec.	

No it is constant in the year.

c. Consumption and sources of water

Current consumption _____ m³ (1998)

Current consumption _____ m³ (1999)

Sources of raw water Own well

Network

Other _____

Is there any monthly water consumption in the production facility?

Yes and they are;

Month	Monthly Consumption	Month	Monthly Consumption
Jan.	M ³ /m	Jul.	M ³ /m
Feb.	M ³ /m	Aug.	M ³ /m
Mar.	M ³ /m	Sep.	M ³ /m
Apr.	M ³ /m	Oct.	M ³ /m
May	M ³ /m	Nov.	M ³ /m
Jun.	M ³ /m	Dec.	M ³ /m

No it is constant in the year.

d. Purpose of the water use

(Brief explanation, for example, cooling water, process water, etc.)

e. Required water quality (e.g. drinking water, does not matter)

f. Do you have water treatment facility?

Yes and they are;

Process _____

Capacity _____

No

2. Future expansion of the facility

a. Do you have expansion plan of the production facilities?

Yes and those plans are;

Current capacity _____ (1999)

By 2005 _____

By 2010 _____

By 2015 _____

By 2020 _____

No

b. Do you have any future plan to increase the raw water consumption?

Yes and those plans are;

By 2005 _____ m^3

By 2010 _____ m^3

By 2015 _____ m^3

By 2020 _____ m^3

And their sources are;

Own wells

Network

Other source _____

No and;

Current consumption _____ m^3 (1999)

Future consumption expected to be on the same level

Future consumption expected to be decreased

to _____ m^3 or _____ %

by means of _____

3. Disposal of wastewater

a. Is there any wastewater discharged from the facility to outside?

Yes Please go to "b."

No end of the Inquiry

b. How much in volume is the wastewater discharged?

Current volume _____ m^3 (1998)

Current volume _____ m^3 (1999)

c. Where is the wastewater discharged to

- Wadi
- Public sewerage system
- Reuse in irrigation

d. Is the water treated by treatment facilities of the factory (pretreatment) before discharging into wadi or public sewerage system?

- Yes
- No

If yes, which treatment process do you apply?

- Screening
- Sedimentation (settling)
- Decreasing
- Biological treatment
- Chemical treatment
- Neutralization
- Others (to specify)

e. What are the final qualities of wastewater at discharge point?

List of Industries to be inquired.

Rank	FACILITY_ID	NAME	PRODUCTION
1	INKA01	ARAB POTASH COMPANY	8,189,436
2	INMN02	JORDAN PHOSPHATE MINES (SHEDIYA)	6,586,884
3	INTA01	JORDAN PHOSPHATE MINES (HASSA)	5,061,816
4	INKA02	PHOSPHATE MINES/WADI AL-ABYAD	3,159,540
5	INZA17	JORDAN PETROLEUM REFINERY CO.	2,210,628
6	INMF08	ARAB WHITE CEMENT INDUSTRIES CO.	1,254,660
7	INIR02	NORTH SHUNEH SPA-JRV3B	873,600
8	INZA18	AL HUSSEIN POWER STATION	815,820
9	INAQ01	AQABA THERMAL POWER STATION	405,640
10	INQA02	JORDAN FERTILIZER INDUSTRY IN AQABA	3,297,204

Production (M³) in 1998

These ten industries consume more than 80% of total industrial demand by eighty (80) industries (28.2 MCM/35.1 MCM).

The Study on Water Resources Management in The Hashemite Kingdom of Jordan
Final Report/Supporting Report Part-A "Master Plan"

Table 1.5.2-6(1) Results of The Questionnaire Survey to Major Factories

Arab Potash Company

Consumption in 1998 (m ³)	9,533,34	Growth '98 to '99
Consumption in 1999 (m ³)	9,817,138	3.00%
Seasonal Variation of Consumption		Monthly Share
in 1999		
Jan.	904,438	9.20%
Feb.	746,486	7.60%
Mar.	736,595	7.50%
Apr.	729,683	7.40%
May	775,124	7.90%
Jun.	778,413	7.90%
Jul.	857,443	8.70%
Aug.	944,354	9.60%
Sep.	832,816	8.50%
Oct.	810,917	8.30%
Nov.	831,998	8.50%
Dec.	868,871	8.90%
Future Plan	1999 9,817,138	Annual Growth
	by 2005 13,000,000	4.80%
	by 2010 13,000,000	0.00%
	by 2015 13,000,000	0.00%
	by 2020 13,000,000	0.00%
Wastewater Discharged (m ³)		Ratio to Water Consumed
	1998 80,000	0.80%
	1999 80,000	0.80%
Water Sources	Own Well, Surface Water	

Jordan Phosphate Mines Co. - Aqaba Industrial Complex

Consumption in 1998 (m ³)	3,619,474	Growth '98 to '99
Consumption in 1999 (m ³)	3,549,426	-1.90%
Seasonal Variation of Consumption		Monthly Share
in 1999		
(Constant) Jan.		
Feb.		
Mar.		
Apr.		
May		
Jun.		
Jul.		
Aug.		
Sep.		
Oct.		
Nov.		
Dec.		
Future Plan	1999 3,549,426	Annual Growth
	by 2005 3,700,000	0.70%
	by 2010 3,800,000	0.50%
	by 2015 4,200,000	2.00%
	by 2020 4,500,000	1.40%
Wastewater Discharged (m ³)		Ratio to Water Consumed
	1998 634,000	17.50%
	1999 620,000	17.50%
Water Sources	Network	

Aqaba Thermal Power Station

Consumption in 1998 (m ³)	915,078	Growth '98 to '99
Consumption in 1999 (m ³)	967,950	5.80%
Seasonal Variation of Consumption		Monthly Share
in 1999		
Jan.	69,875	
Feb.	55,658	
Mar.	61,788	
Apr.	69,043	
May	56,551	
Jun.	52,336	
Jul.		
Aug.		
Sep.		
Oct.		
Nov.		
Dec.		
Future Plan (35% Reduction)	1999 967,950	Annual Growth
	by 2005 629,168	-6.90%
	by 2010 629,168	0.00%
	by 2015 629,168	0.00%
	by 2020 629,168	0.00%
Wastewater Discharged (m ³)		Ratio to Water Consumed
	1998	
	1999	
Water Sources	Network, Sea Water	

Arab Company for White Cement Industry

Consumption in 1998 (m ³)	121,050	Growth '98 to '99
Consumption in 1999 (m ³)	104,730	-13.50%
Seasonal Variation of Consumption		Monthly Share
in 1999		
Jan.	8,599	8.20%
(Closed) Feb.	852	0.80%
Mar.	4,740	4.50%
Apr.	11,672	11.10%
May	10,753	10.30%
Jun.	9,430	9.00%
Jul.	8,638	8.20%
Aug.	11,422	10.90%
Sep.	7,254	6.90%
Oct.	12,542	12.00%
Nov.	11,429	10.90%
Dec.	7,400	7.10%
Future Plan	1999 104,731	Annual Growth
(No Expansion Plan)	by 2005 104,731	0.00%
	by 2010 104,731	0.00%
	by 2015 104,731	0.00%
	by 2020 104,731	0.00%
Wastewater Discharged (m ³)		Ratio to Water Consumed
(10 m ³ per Day)	1998 3,650	3.00%
	1999 3,650	3.50%
Water Sources	Own Well, Network	

Jordan Phosphate Mines Co. - Aqaba Industrial Complex

Consumption in 1998 (m ³)	3,619,474	Growth '98 to '99
Consumption in 1999 (m ³)	3,549,426	-1.90%
Seasonal Variation of Consumption		Monthly Share
in 1999 (Constant)		
Jan.		
Feb.		
Mar.		
Apr.		
May		
Jun.		
Jul.		
Aug.		
Sep.		
Oct.		
Nov.		
Dec.		
Future Plan	1999 3,549,426	Annual Growth
	by 2005 3,700,000	0.70%
	by 2010 3,800,000	0.50%
	by 2015 4,200,000	2.00%
	by 2020 4,500,000	1.40%
Wastewater Discharged (m ³)		Ratio to Water Consumed
	1998 634,000	17.50%
	1999 620,000	17.50%
Water Sources	Network	

Jordan Petroleum Refinery Company

Consumption in 1998 (m ³)	2,227,023	Growth '98 to '99
Consumption in 1999 (m ³)	2,187,984	-1.80%
Seasonal Variation of Consumption		Monthly Share
in 1999		
Jan.	153,108	7.00%
Feb.	128,375	5.90%
Mar.	152,670	7.00%
Apr.	162,695	7.40%
May	194,950	8.90%
Jun.	197,196	9.00%
Jul.	197,197	9.00%
Aug.	222,350	10.20%
Sep.	192,100	8.80%
Oct.	203,079	9.30%
Nov.	208,342	9.50%
Dec.	175,922	8.00%
Future Plan	1999 2,187,984	Annual Growth
	by 2005 2,500,000	2.20%
	by 2010 3,200,000	5.10%
	by 2015 3,200,000	0.00%
	by 2020 4,500,000	7.10%
Wastewater Discharged (m ³)		Ratio to Water Consumed
	1998 700,000	31.40%
	1999 700,000	32.00%
Water Sources	Own Well	

*The Study on Water Resources Management in The Hashemite Kingdom of Jordan
Final Report/Supporting Report Part-A "Master Plan"*

Table 1.5.2-6(2) Results of The Questionnaire Survey to Major Factories

JPMC (phosphate manufacturing)

Consumption in 1998 (m ³)	4,532,230	Growth '98 to '99	
Consumption in 1999 (m ³)	4,887,893	7.80%	
Seasonal Variation of Consumption		Monthly Share	
in 1999			
Jan.	426,552	8.70%	
Feb.	370,845	7.60%	
Mar.	414,356	8.50%	
Apr.	410,088	8.40%	
May	430,360	8.80%	
Jun.	424,044	8.70%	
Jul.	398,902	8.20%	
Aug.	377,756	7.70%	
Sep.	402,659	8.20%	
Oct.	391,947	8.00%	
Nov.	410,006	8.40%	
Dec.	430,378	8.80%	
Future Plan	1999	4,887,893	Annual Growth
(Same Level as in 1999)	by 2005	4,887,893	0.00%
	by 2010	4,887,893	0.00%
	by 2015	4,887,893	0.00%
	by 2020	4,887,893	0.00%
Wastewater Discharged (m ³)		Ratio to Water Consumed	
	1998	3,625,784	80.00%
	1999	3,910,314	80.00%
Water Sources	Own Well		

Jordan Phosphate Mines Co. / Shidiya Dept.

Consumption in 1998 (m ³) - All Purposes	6,500,000	Growth '98 to '99	
Consumption in 1999 (m ³) - All Purposes	6,100,000	-6.20%	
Seasonal Variation of Consumption		Monthly Share	
in 1999 (for Industrial Production			
Jan.	481,000	8.30%	
Feb.	160,000	2.80%	
Mar.	500,000	8.60%	
Apr.	560,000	9.60%	
May	580,000	10.00%	
Jun.	525,000	9.00%	
Jul.	480,000	8.30%	
Aug.	420,000	7.20%	
Sep.	480,000	8.30%	
Oct.	550,000	9.50%	
Nov.	540,000	9.30%	
Dec.	530,000	9.10%	
Future Plan	1999	6,100,000	Annual Growth
(Same Level as in 1999)	by 2005	25,000,000	26.50%
	by 2010	NA	
	by 2015	NA	
	by 2020	NA	
Wastewater Discharged (m ³)		Ratio to Water Consumed	
	1998	2,800,000	43.10%
	1999	2,700,000	44.30%
Water Sources	Own Well		

Jordan Phosphate Mines Co. Ltd.

Consumption in 1998 (m ³)	40,000,000	Growth '98 to '99	
Consumption in 1999 (m ³)	37,000,000	-7.50%	
Seasonal Variation of Consumption		Monthly Share	
in 1999			
Jan.	45,000	8.40%	
Note: Does not match with	Feb.	44,000	8.20%
the year total)	Mar.	45,000	8.40%
	Apr.	45,000	8.40%
	May	45,000	8.40%
	Jun.	43,000	8.00%
	Jul.	47,000	8.80%
	Aug.	45,000	8.40%
	Sep.	45,000	8.40%
	Oct.	42,000	7.90%
	Nov.	44,000	8.20%
	Dec.	45,000	8.40%
Future Plan (35% Reduction)	1999	37,000,000	Annual Growth
(In 2010 to be shun down	by 2005	37,000,000	0.00%
due to depletion of ore)	by 2010	37,000,000	0.00%
	by 2015	0	-100.00%
	by 2020	0	0.00%
Wastewater Discharged (m ³)		Ratio to Water Consumed	
	1998	640,000	1.60%
	1999	620,000	1.70%
Water Sources	Own Well		

Oil Shale Operations:

Background: The government of Jordan is encouraging International firms to invest in the exploitation of oil shale crude material for the extraction of oil and hence secure local sources for energy. A Canadian Company for the implementation of the above project therefore submitted a technical proposal and pre-feasibility study to the Natural Resources Authority.

Description : Distillation of crude oil shale in Lajjoun area – Attarat / Umm AL Ghadran, for the extraction of oil and any other possible side products. Mining and oil shale operations would require the use of 3.25 MCM during phase I of the project (2003 - 2008). Water needed during the next phases is listed below:

Phase	Year	Total Quantity Per Year (MCM)
I	2003-2008	3.25
II	2008-2012	13.00
III	2012-2016	26.00
IV	2016-end of project	39.00

MWI has permitted the use of local groundwater to secure the requirements during the first phase of the project at 250 Fils/M3. However, additional quantities needed during the second phase will be secured from other strategic water projects.

The Canadian firm is willing in the meantime to examine the possibility of recycling of water in the oil shale operations, rainwater and surface water harvesting through the construction of reservoirs, canals and wastewater treatment.

Project Status: a Canadian Company submitted A technical proposal and pre-feasibility study. A local committee has been formed in order to negotiate the terms of the contract with the Canadian Company. The Natural Resources Authority (NRA) has hired the services of an International Consultant to help the local committee prepare the best contractual terms necessary for the implementation of the project.

CYBER CITY INDUSTRIAL PARK: **JORDANIAN SCIENCE & TEHNOLOGY UNIVERSITY (JUST).**

Background :-

The Government of Jordan encourages investment in the Information Technology Industries.

Industry and Information Technology Park Development Co. is presently developing an information and Technology and Industrial (“Park”) within Jordan University of Science and Technology “JUST”.

The park Intends to promote the following social objectives:-

- Develop the Domestic products on the national level as a complete range of industrial, commercial, Leisure and living facilities. This will include Research Development, information Technology, Electronics industry, ... etc.
- Create employment opportunity, skill acquisition and growth in the country.

Description :-

The tenants of the park will include Research and Development facility information Technology Industry, electronic and other light industry. The creation of this industry would require the use of 7.5 million m³/year during three phases of the project (2001-2004).

MWI studied the water resources availability in the region and found several alternatives to secure the water requirements of that industry. Drilling several wells to the upper aquifers (Ajlun Series) and deeper aquifers *Kurnub and Zerqa) is an alternative.

The Water availability in the second and third phases of the project depends on the implementation of the Strategic Water Projects as Alwihdeh dam, Disi Water Supply Project, ...etc.

Project Status :-

The Company is going to start construction of the infrastructure in the year 2001 and has applied for licenses for drilling two wells tapping the upper aquifers on the site.

Table 1.5.2-7 Projection of Annual Growth Rate of Industrial Water Demand, Scenario 2

(Unit: JD million)

Item	1992	1993	1994	1995	1996	1997	1998	1999
Industrial Gross Output at 1985 Prices	365.9	376.4	454.6	490.6	463.6	487.2	491.9	508.9

Source: Department of Statistics-National Accounts Division; National Accounts 1988-1999

Logarithmic Regression Analysis

Item	1992	1993	1994	1995	1996	1997	1998	1999
Logarithm of IGO	5.90236	5.930652	6.119418	6.195629	6.139022	6.188675	6.198275	6.232252

Correlation Coefficient	0.874191
--------------------------------	-----------------

Projection of IGO

Item	2005	2010	2015	2020
Logarithm of IGO	6.54288	6.768982	6.995084	7.221187
Natural Number of IGO	694.3	870.4	1091.3	1368.1
Annual Growth Rate	5.3%	4.6%	4.6%	4.6%

Explanation: Logarithmic regression analysis was performed on the industrial gross output data 1992 to 1999 to project future industrial water demand on the premise that industrial water demand grows in parallel with industrial gross output.

Table 1.5.2-8 Projection of Industrial Water Demand by Scenario, by Governorate and by Target Year (MCM)

INDUSTRIAL_Sc.	2005			2010			2015			2020		
	net	losses	sum	net	losses	sum	net	losses	sum	net	losses	sum
AM	1.14	0.00	1.14	1.33	0.00	1.33	1.48	0.00	1.48	1.56	0.00	1.56
ZA	22.12	0.30	22.42	23.34	0.30	23.64	24.29	0.30	24.59	24.83	0.30	25.13
MF	0.30	0.00	0.30	0.35	0.00	0.35	0.38	0.00	0.38	0.40	0.00	0.40
IR	8.74	0.15	8.89	8.97	0.15	9.12	9.14	0.15	9.29	9.24	0.15	9.39
AJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
JA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BA	0.59	0.00	0.59	0.69	0.00	0.69	0.77	0.00	0.77	0.81	0.00	0.81
MA	0.23	0.00	0.23	0.26	0.00	0.26	0.29	0.00	0.29	0.31	0.00	0.31
KA	18.33	0.07	18.39	30.38	0.26	30.64	45.05	0.52	45.57	58.89	0.78	59.67
MN	9.32	0.00	9.32	10.86	0.00	10.86	12.05	0.00	12.05	12.72	0.00	12.72
TA	6.75	0.00	6.75	7.86	0.00	7.86	8.73	0.00	8.73	9.22	0.00	9.22
AQ	6.19	1.87	8.05	7.21	2.18	9.38	8.00	2.41	10.41	8.44	2.55	10.99
Total:	73.70	2.38	76.08	91.25	2.89	94.13	110.17	3.38	113.55	126.43	3.78	130.21
Differences to WB spread sheet are due to shift in net work supplied small industries from Municipal to Industries.												
INDUSTRIAL_Sc.	net	losses	sum	net	losses	sum	net	losses	sum	net	losses	sum
AM	1.23	0.00	1.23	1.54	0.00	1.54	1.93	0.00	1.93	2.41	0.00	2.41
ZA	22.68	0.30	22.98	24.70	0.30	24.70	27.22	0.30	27.52	30.37	0.30	30.67
MF	0.32	0.00	0.32	0.40	0.00	0.40	0.50	0.00	0.50	0.63	0.00	0.63
IR	8.84	0.15	8.99	9.22	0.15	9.22	9.69	0.15	9.84	10.28	0.15	10.43
AJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
JA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BA	0.64	0.00	0.64	0.80	0.00	0.80	1.00	0.00	1.00	1.26	0.00	1.26
MA	0.24	0.00	0.24	0.31	0.00	0.31	0.38	0.00	0.38	0.48	0.00	0.48
KA	19.48	0.07	19.55	33.14	0.26	33.14	51.03	0.52	51.55	70.21	0.78	70.99
MN	10.03	0.00	10.03	12.56	0.00	12.56	15.73	0.00	15.73	19.69	0.00	19.69
TA	7.27	0.00	7.27	9.10	0.00	9.10	11.39	0.00	11.39	14.27	0.00	14.27
AQ	6.66	2.16	8.82	8.34	2.81	9.81	10.44	3.66	14.10	13.07	4.76	17.83
Total:	77.40	2.68	80.07	100.10	3.52	101.57	129.31	4.63	133.94	162.67	5.99	168.66
Reminder: 2% losses of sudden expansions supplied by conveyor. These losses need to be regarded when preparing entry figures for losses module.												
INDUSTRIAL_Sc.	net	losses	sum	net	losses	sum	net	losses	sum	net	losses	sum
AM	1.05	0.00	1.05	1.21	0.00	1.21	1.39	0.00	1.39	1.61	0.00	1.61
ZA	21.49	0.30	21.79	22.54	0.30	22.84	23.74	0.30	24.04	25.13	0.30	25.43
MF	0.27	0.00	0.27	0.31	0.00	0.31	0.36	0.00	0.36	0.42	0.00	0.42
IR	8.62	0.15	8.77	8.82	0.15	8.97	9.04	0.15	9.19	9.30	0.15	9.45
AJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
JA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BA	0.54	0.00	0.54	0.63	0.00	0.63	0.72	0.00	0.72	0.84	0.00	0.84
MA	0.21	0.00	0.21	0.24	0.00	0.24	0.28	0.00	0.28	0.32	0.00	0.32
KA	17.05	0.07	17.12	28.74	0.26	29.00	43.94	0.52	44.46	59.51	0.78	60.29
MN	8.54	0.00	8.54	9.85	0.00	9.85	11.36	0.00	11.36	13.11	0.00	13.11
TA	6.18	0.00	6.18	7.13	0.00	7.13	8.23	0.00	8.23	9.49	0.00	9.49
AQ	5.67	1.71	7.38	6.54	1.97	8.51	7.54	2.28	9.82	8.70	2.63	11.33
Total:	69.62	2.23	71.85	86.00	2.68	88.68	106.61	3.25	109.85	128.42	3.86	132.28
Losses 2% for Conveyors, % shown only for network connected industries!												

ANNEX to 1.5.3
Touristic Water

Table 1.5.3-3 Data for Projection of Touristic Water Demand

Tourism Data									
1994	1995	1996	1997	1998	1999				
1	2	3	4	5	6				
1. Arrivals of Tourists									
857610	1073549	1102752	1127028	1256428	1357822				
2. Tourism Receipts JD Million									
406.4	462.5	527.2	548.8	548.5	564.1				
3. Total Nights Spent									
2963576	3505384	3242319	3248957	3179849	3730941				
4. - Classified Hotels									
2145580	2672732	2536875	2513353	2445389	2934108				
5. - Unclassified Hotels									
817996	832652	705444	735604	734460	796833				
6. Total Number of Beds									
17709	20613	22735	23777	27050	31765				
7. - Classified Hotels									
13692	16093	17756	19074	21941	26295				
8. - Unclassified Hotels									
4017	4520	4979	4703	5109	5470				
Code No.	Cor. Coef.	Projections				Annual Growth Rate			
		2005	2010	2015	2020	2005	2010	2015	2020
1	0.96150	1875734	2314873	2754012	3193151	5.5%	4.3%	3.5%	3.0%
2	0.92136	769	922	1074	1227	5.3%	3.7%	3.1%	2.7%
3	0.57062								
4	0.66534								
5	-0.37888								
6	0.97964	45952	58900	71848	84795	6.3%	5.1%	4.1%	3.4%
7	0.97899	39026	50723	62420	74116	6.8%	5.4%	4.2%	3.5%
8	0.925991	6926	8177	9428	10679	4.0%	3.4%	2.9%	2.5%
Bed Occupancy Rate									
1994	1995	1996	1997	1998	1999				
Total									
45.85%	46.59%	39.07%	37.44%	32.21%	32.18%				
- Classified									
42.93%	45.50%	39.14%	36.10%	30.54%	30.57%				
- Unclassified									
55.79%	50.47%	38.82%	42.85%	39.39%	39.91%				

Conversion to Logarithm									
1994	1995	1996	1997	1998	1999				
1. Arrivals of Tourists - log									
13.66190	13.88648	13.91332	13.93509	14.04378	14.12139				
2. Tourism Receipts JD Million - log									
6.00734	6.13665	6.26758	6.30773	6.30719	6.33523				
3. Total Number of Beds - log									
9.78183	9.93368	10.03166	10.07647	10.20544	10.36612				
4. - Classified - log									
9.52457	9.68614	9.78448	9.85608	9.99611	10.17713				
5. - Unclassified - log									
8.29829	8.41627	8.51298	8.45596	8.53876	8.60703				
Projections (log)									
Code No.	Cor. Coef.	2005	2010	2015	2020				
1	0.94891	14.60484	15.00357	15.40230	15.80104				
2	0.91060	6.75911	7.07215	7.38518	7.69822				
3	0.98851	10.98425	11.52447	12.06470	12.60492				
4	0.99104	10.87305	11.48224	12.09144	12.70063				
5	0.92094	8.92185	9.18673	9.45161	9.71649				
Code No.		Projections				Annual Growth Rate			
		2005	2010	2015	2020	2005	2010	2015	2020
1		2,201,919	3,280,714	4,888,047	7,282,867	8.4%	8.3%	8.3%	8.3%
2		862	1,179	1,612	2,204	7.3%	6.5%	6.5%	6.5%
3		58,938	101,161	173,633	298,021	10.9%	11.4%	11.4%	11.4%
4		52,736	96,978	178,338	327,954	12.3%	13.0%	13.0%	13.0%
5		7,494	9,767	12,729	16,589	5.4%	5.4%	5.4%	5.4%

Source: Ministry of Tourism

Explanation: Two kinds of regression analysis was performed to the concerned variables shown above: simple and logarithmic. There are three variables with higher correlation coefficients, namely tourist arrivals, total number of beds and the number of beds for the classified hotels. As touristic water demand is considered to be more related to the demand variable, touristic arrivals rather than the supply variable, number of beds, the growth rates of touristic arrivals were ultimately adopted for the projection of future touristic water demand. The projections using logarithmic regression analysis were used for Scenario 2 and those using simple regression analysis were assigned for Scenario 3.

Table 1.5.3-4 Projection of Touristic Water Demand by Scenario, by Governorate and by Target Year (MCM)

TOURISTIC_Sc.1	2005			2010			2015			2020		
	net	losses 20%	sum	net	losses 15%	sum	net	losses 15%	sum	net	losses 15%	sum
AM	0.82	0.20	1.02	1.04	0.18	1.23	1.18	0.21	1.39	1.34	0.24	1.57
ZA	0.01	0.00	0.01	0.01	0.00	0.02	0.02	0.00	0.02	0.02	0.00	0.02
MF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IR	0.02	0.00	0.02	0.02	0.00	0.03	0.03	0.00	0.03	0.03	0.01	0.04
AJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
JA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BA	2.13	0.53	2.67	4.00	0.71	4.70	5.90	1.04	6.94	5.90	1.04	6.94
MA	1.88	0.47	2.35	3.75	0.66	4.41	5.57	0.98	6.55	5.57	0.98	6.56
KA	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.02	0.02	0.00	0.02
MN	0.10	0.03	0.13	0.13	0.02	0.16	0.15	0.03	0.18	0.17	0.03	0.20
TA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AQ	0.55	0.14	0.69	0.70	0.12	0.83	0.80	0.14	0.94	0.90	0.16	1.06
Total:	5.54	1.38	6.92	9.69	1.71	11.40	13.67	2.41	16.08	13.96	2.46	16.42
TOURISTIC_Sc.2	net	losses 20%	sum	net	losses 15%	sum	net	losses 15%	sum	net	losses 15%	sum
AM	1.02	0.26	1.28	1.52	0.27	1.79	2.27	0.40	2.67	3.38	0.60	3.98
ZA	0.01	0.00	0.02	0.02	0.00	0.02	0.03	0.01	0.04	0.05	0.01	0.06
MF	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.01
IR	0.02	0.01	0.03	0.03	0.01	0.04	0.05	0.01	0.06	0.08	0.01	0.09
AJ	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.01
JA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
BA	4.11	1.03	5.13	6.19	1.09	7.29	6.19	1.09	7.29	6.19	1.09	7.29
MA	2.63	0.66	3.29	5.58	0.98	6.56	5.59	0.99	6.57	5.61	0.99	6.60
KA	0.01	0.00	0.02	0.02	0.00	0.02	0.03	0.00	0.03	0.04	0.01	0.05
MN	0.13	0.03	0.16	0.19	0.03	0.23	0.29	0.05	0.34	0.43	0.08	0.51
TA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
AQ	0.69	0.17	0.86	1.03	0.18	1.21	1.53	0.27	1.80	2.28	0.40	2.69
Total:	8.64	2.16	10.79	14.60	2.58	17.18	16.00	2.82	18.82	18.09	3.19	21.28
TOURISTIC_Sc.3	net	losses 20%	sum	net	losses 15%	sum	net	losses 15%	sum	net	losses 15%	sum
AM	0.85	0.21	1.06	1.04	0.18	1.23	1.24	0.22	1.46	1.44	0.25	1.69
ZA	0.01	0.00	0.01	0.01	0.00	0.02	0.02	0.00	0.02	0.02	0.00	0.02
MF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IR	0.02	0.00	0.02	0.02	0.00	0.03	0.03	0.00	0.03	0.03	0.01	0.04
AJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
JA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BA	4.11	1.03	5.13	6.19	1.09	7.29	6.19	1.09	7.29	6.19	1.09	7.29
MA	2.63	0.66	3.28	5.57	0.98	6.55	5.57	0.98	6.55	5.57	0.98	6.56
KA	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.00	0.02	0.02	0.00	0.02
MN	0.11	0.03	0.13	0.13	0.02	0.16	0.16	0.03	0.19	0.18	0.03	0.22
TA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AQ	0.57	0.14	0.71	0.70	0.12	0.83	0.84	0.15	0.98	0.97	0.17	1.14
Total:	8.30	2.08	10.38	13.70	2.42	16.12	14.07	2.48	16.55	14.44	2.55	16.99