

Water Allocation System (WAS v1.0)
Developed by: The Harvard Middle East Water Project

Year: 2020 - Middle Palestinian Growth Scenario
"Optimal" Scenario
Scenario PLAUSIBLE+: Plausible+ Links and Recycling

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OPTIMAL GAMS RESULTS FOR WAS.GMS
 PRICES

ISRAEL

DISTRICT	FPRICE	RPRICE	PURB	PIND	PAGR
Hacola	0.281	0.281	0.58	0.58	0.28
Kinneret	0.281	0.281	0.58	0.58	0.28
WestGalil	0.336	0.336	0.64	0.64	0.34
Haifa	0.326	0.326	0.48	0.48	0.33
Afula	0.361	0.361	0.66	0.66	0.36
Hadera	0.376	0.376	0.68	0.68	0.38
Netanya	0.371	0.371	0.49	0.49	0.37
PTiqwa	0.418	0.418	0.72	0.72	0.42
TelAviv	0.429	0.100	0.73	0.73	0.13
Ramla	0.409	0.409	0.71	0.71	0.41
Rehovot	0.400	0.400	0.70	0.70	0.40
Lachish	0.800	0.168	1.06	1.06	0.25
Negev	0.838	0.162	1.10	1.10	0.25

JORDAN

DISTRICT	FPRICE	RPRICE	PURB	PIND	PAGR
JordanV	0.254	0.254	0.55	0.55	0.25
NHighland	0.325	0.325	0.48	0.48	0.33
Amman	0.483	0.249	0.68	0.68	0.29
DeadSea	0.466	0.466	0.77	0.77	0.47
Azraq	0.345	0.345	0.65	0.65	0.35
WadiAraba	0.800	0.800	1.10	1.10	0.80
MaanDisi	0.480	0.480	0.78	0.78	0.48
Hammad	0.132	0.132	0.43	0.43	0.13

PALESTINE

DISTRICT	FPRICE	RPRICE	PURB	PIND	PAGR
Jenin	0.387	0.387	0.69	0.69	0.39
Tulkarem	0.388	0.388	0.69	0.69	0.39
Nablus	0.427	0.103	0.73	0.73	0.14
Ramallah	0.438	0.103	0.74	0.74	0.14
Bethlehem	0.752	0.103	1.05	1.05	0.17
Hebron	0.851	0.103	1.15	1.15	0.18
GazaN	0.800	0.124	1.08	1.08	0.20
GazaS	0.800	0.103	1.10	1.10	0.17
Jericho	0.185	0.108	0.49	0.49	0.12

GOLAN

DISTRICT	FPRICE	RPRICE	PURB	PIND	PAGR
Golan	0.257	0.257	0.56	0.56	0.26

JERUSALEM

DISTRICT	FPRICE	RPRICE	PURB	PIND	PAGR
Jerusalem	0.435	0.100	0.74	0.74	0.13

Net Price of water in dispute in the Sea of Galilee is 0.281
 Average Net Price of water in dispute in the mountain aquifer is 0.233

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Year: 2020 - Middle Palestinian Growth Scenario
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OPTIMAL GAMS RESULTS FOR WAS.GMS
 QUANTITIES

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ISRAEL

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DISTRICT	PRODN	NET.EXP	URBDEM	INDDEM	AGRDEM
Hacola	80.00	-17.13	14.56	1.76	80.81
Kinneret	560.00	487.92	14.60	0.88	56.60
WestGalil	102.00	-7.86	66.62	2.62	40.62
Haifa	156.00	0.00	57.96	4.36	134.81
Afula	40.00	-73.41	87.72	15.95	9.74
Hadera	7.00	-100.35	37.42	8.66	61.28
Netanya	222.00	138.55	47.83	2.12	66.46
PTiqwa	40.00	-70.10	70.22	1.29	38.59
TelAviv	8.00	-203.91	205.02	6.00	8.92
Ramla	124.89	71.19	23.18	3.17	27.35
Rehovot	187.98	84.34	56.42	4.72	42.51
Lachish	96.94	36.15	41.43	2.32	131.46
Negev	44.85	-61.12	57.91	24.80	182.80
TOTAL	1669.66	284.25	780.89	78.65	881.95

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JORDAN

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DISTRICT	PRODN	NET.EXP	URBDEM	INDDEM	AGRDEM
JordanV	136.00	40.76	21.03	0.00	89.79
NHighland	225.00	19.86	73.36	0.03	180.19
Amman	133.50	-201.88	299.27	1.79	217.44
DeadSea	137.00	97.22	30.46	4.38	4.95
Azraq	47.00	44.04	2.96	0.00	0.00
WadiAraba	137.16	0.00	16.11	0.03	121.02
MaanDisi	124.00	0.00	4.51	1.06	118.43
Hammad	0.50	0.00	0.50	0.00	0.00
TOTAL	940.16	0.00	448.19	7.29	731.81

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PALESTINE

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DISTRICT	PRODN	NET.EXP	URBDEM	INDDEM	AGRDEM
Jenin	65.40	-94.36	72.94	1.13	85.69
Tulkarem	37.33	-63.98	74.81	3.80	22.70
Nablus	39.97	-53.71	84.47	4.26	48.67
Ramallah	31.37	-57.58	83.81	2.90	22.01
Bethlehem	53.67	1.36	47.22	2.99	20.58
Hebron	62.20	-37.51	86.57	7.16	58.90
GazaN	209.51	61.12	139.60	4.44	38.98
GazaS	137.99	0.00	128.68	4.42	48.22
Jericho	35.86	16.08	10.30	0.67	84.70
TOTAL	673.30	-228.57	728.41	31.77	430.46

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GOLAN

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DISTRICT	PRODN	NET.EXP	URBDEM	INDDEM	AGRDEM
Golan	40.00	5.91	5.14	0.25	28.69

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JERUSALEM

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DISTRICT	PRODN	NET.EXP	URBDEM	INDDEM	AGRDEM
Jerusalem	50.00	-61.59	108.14	0.41	30.42

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OPTIMAL GAMS RESULTS FOR WAS.GMS
 RECYCLED QUANTITIES

ISRAEL

DISTRICT	FrmURB	FrmIND	FrmAGR	ToAGR	NET.EXP
Hacola	0.00	0.00	0.00	0.00	0.00
Kinneret	0.00	0.00	0.00	0.00	0.00
WestGalil	0.00	0.00	0.00	0.00	0.00
Haifa	38.25	2.88	0.00	41.13	0.00
Afula	0.00	0.00	0.00	0.00	0.00
Hadera	0.00	0.00	0.00	0.00	0.00
Netanya	31.57	1.40	0.00	32.97	0.00
PTiqwa	0.00	0.00	0.00	0.00	0.00
TelAviv	93.58	0.00	0.00	8.03	85.55
Ramla	0.00	0.00	0.00	0.00	0.00
Rehovot	0.00	0.00	0.00	0.00	0.00
Lachish	27.34	1.53	0.00	114.42	-85.55
Negev	38.22	16.37	0.00	159.53	-104.94
TOTAL	228.96	22.18	0.00	356.08	-104.94

JORDAN

DISTRICT	FrmURB	FrmIND	FrmAGR	ToAGR	NET.EXP
JordanV	0.00	0.00	0.00	15.58	-15.58
NHighland	48.42	0.02	0.00	48.44	0.00
Amman	197.51	1.18	0.00	183.12	15.58
DeadSea	0.00	0.00	0.00	0.00	0.00
Azraq	0.00	0.00	0.00	0.00	0.00
WadiAraba	0.00	0.00	0.00	0.00	0.00
MaanDisi	0.00	0.00	0.00	0.00	0.00
Hammad	0.00	0.00	0.00	0.00	0.00
TOTAL	245.93	1.20	0.00	247.13	0.00

PALESTINE

DISTRICT	FrmURB	FrmIND	FrmAGR	ToAGR	NET.EXP
Jenin	0.00	0.00	0.00	0.00	0.00
Tulkarem	0.00	0.00	0.00	0.00	0.00
Nablus	55.75	2.81	0.00	43.73	14.83
Ramallah	55.32	1.92	0.00	19.77	37.46
Bethlehem	31.17	1.97	0.00	18.49	14.65
Hebron	57.14	4.72	0.00	52.92	8.95
GazaN	92.14	2.93	0.00	34.64	60.42
GazaS	84.93	2.92	0.00	43.33	44.52
Jericho	0.00	0.00	0.00	75.89	-75.89
TOTAL	376.44	17.27	0.00	288.77	104.94

GOLAN

DISTRICT	FrmURB	FrmIND	FrmAGR	ToAGR	NET.EXP
Golan	0.00	0.00	0.00	0.00	0.00

JERUSALEM

DISTRICT	FrmURB	FrmIND	FrmAGR	ToAGR	NET.EXP
Jerusalem	27.38	0.00	0.00	27.38	0.00

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OPTIMAL GAMS RESULTS FOR WAS.GMS
 SOCIAL WELFARE RESULTS

ISRAEL

DISTRICT	PROFITS	GOVT.COSTS	BUYR.SURP.	SOC.WEL
Hacola	6.488	0.000	110.951	117.439
Kinneret	157.415	0.000	81.741	239.156
WestGalil	19.630	0.000	120.511	140.141
Haifa	3.187	0.000	228.378	231.565
Afula	7.700	0.000	121.409	129.109
Hadera	1.471	0.000	126.176	127.647
Netanya	47.422	0.000	135.098	182.520
PTiqwa	8.676	0.000	122.017	130.693
TelAviv	0.232	0.000	220.044	220.276
Ramla	26.015	0.000	62.602	88.616
Rehovot	22.885	0.000	117.249	140.134
Lachish	31.393	0.000	161.971	193.364
Negev	19.503	0.000	249.534	269.038
TOTAL	352.018	0.000	1857.681	2209.699

JORDAN

DISTRICT	PROFITS	GOVT.COSTS	BUYR.SURP.	SOC.WEL
JordanV	16.609	0.000	122.584	139.193
NHighland	15.704	0.000	293.429	309.132
Amman	42.643	0.000	540.313	582.956
DeadSea	28.054	0.000	42.598	70.653
Azraq	15.401	0.000	2.995	18.396
WadiAraba	13.132	0.000	191.231	204.362
MaanDisi	44.768	0.000	164.100	208.869
Hammad	0.000	0.000	0.511	0.511
TOTAL	176.311	0.000	1357.760	1534.072

PALESTINE

DISTRICT	PROFITS	GOVT.COSTS	BUYR.SURP.	SOC.WEL
Jenin	5.285	0.000	183.645	188.930
Tulkarem	6.244	0.000	109.064	115.309
Nablus	7.479	0.000	128.636	136.115
Ramallah	5.747	0.000	104.996	110.743
Bethlehem	22.361	0.000	64.320	86.680
Hebron	32.924	0.000	133.948	166.871
GazaN	23.400	0.000	168.988	192.388
GazaS	16.900	0.000	163.091	179.991
Jericho	4.350	0.000	81.523	85.872
TOTAL	124.690	0.000	1138.209	1262.899

GOLAN

DISTRICT	PROFITS	GOVT.COSTS	BUYR.SURP.	SOC.WEL
Golan	2.284	0.000	38.006	40.290

JERUSALEM

DISTRICT	PROFITS	GOVT.COSTS	BUYR.SURP.	SOC.WEL
Jerusalem	1.765	0.000	132.447	134.212

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OPTIMAL GAMS RESULTS FOR WAS.GMS
 TRANSPORT OF FRESH WATER

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LINKAGES USED AND QUANTITIES TRANSPORTED

FROM	TO	QTY. TRANSPORTED
Golan	NC-Golan	5.91
Kinneret	NC-SeaOfGal	487.92
Netanya	NC-Hadera	138.55
Ramla	NC-Ramla	71.19
Rehovot	NC-Rehovot	84.34
Lachish	NC-Lachish	36.15
JordanV	Amman	40.76
NHighlands	Azraq	19.86
DeadSea	Amman	97.22
Azraq	Amman	63.90
Bethlehem	NC-Bethlehem	1.36
GazaN	NC-GazaN	61.12
Jericho	NC-SeaOfGal	16.08
NC-Hacola	Hacola	17.13
NC-Golan	NC-Hacola	17.13
NC-SeaOfGal	NC-Golan	11.22
NC-SeaOfGal	NC-WestGalil	492.78
NC-WestGalil	WestGalil	7.86
NC-WestGalil	NC-Haifa	484.92
NC-Haifa	NC-Afula	484.92
NC-Afula	Afula	73.41
NC-Afula	NC-Netanya	411.51
NC-Hadera	NC-Tulkarem	355.35
NC-Netanya	Hadera	100.35
NC-Netanya	NC-Jenin	311.15
NC-PTiqwa	PTiqwa	70.10
NC-PTiqwa	NC-TelAviv	167.56
NC-TelAviv	TelAviv	203.91
NC-Ramla	NC-TelAviv	36.35
NC-Ramla	NC-Ramallah	34.84
NC-Rehovot	NC-Jerusalem	61.59
NC-Rehovot	NC-Ramallah	22.74
NC-Jerusalem	Jerusalem	61.59
NC-Lachish	NC-Hebron	37.51
NC-Negev	Negev	61.12
NC-Jenin	Jenin	94.36
NC-Jenin	NC-Hadera	216.79
NC-Tulkarem	Tulkarem	63.98
NC-Tulkarem	NC-Nablus	291.37
NC-Nablus	Nablus	53.71
NC-Nablus	NC-PTiqwa	237.66
NC-Ramallah	Ramallah	57.58
NC-Bethlehem	NC-Lachish	1.36
NC-Hebron	Hebron	37.51
NC-GazaN	NC-Negev	61.12

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OPTIMAL GAMS RESULTS FOR WAS.GMS
TRANSPORT OF RECYCLED WATER

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LINKAGES USED AND QUANTITIES TRANSPORTED

FROM	TO	QTY. TRANSPORTED
TelAviv	Lachish	85.55
Amman	JordanV	15.58
Nablus	Jericho	14.83
Ramallah	Jericho	37.46
Bethlehem	Jericho	14.65
Hebron	Jericho	8.95
GazaN	Negev	60.42
GazaS	Negev	44.52

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OPTIMAL GAMS RESULTS FOR WAS.GMS
 DISPUTED QUANTITIES: MOUNTAIN AQUIFER

DISTRICT	SOURCE	QTY. PUMPED	MAX. QTY
Afula	S1	32.00	32.00
Afula	S2	8.00	8.00
Afula	S3	0.00	40.00
Hadera	S1	7.00	7.00
Hadera	S2	0.00	11.00
Netanya	S2	132.00	132.00
Netanya	S3	0.00	37.00
Ramla	S1	124.89	150.00
Lachish	S3	0.00	57.00
Negev	S3	12.85	25.00
Jenin	S4	51.16	98.33
Tulkarem	S3	6.68	6.68
Tulkarem	S4	6.36	134.95
Nablus	S4	20.56	20.56
Ramallah	S4	0.00	128.57
Bethlehem	S3	28.79	28.79
Hebron	S2	9.62	9.62
Hebron	S3	46.68	46.68

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