Table 2. Irrigated Areas and Cultivation Practices (1994-1995)

Country	Irrigated Area (M.ha)			Percentage area of total under-ground water	Irrigation Practices (M.ha) adopted		Percentage Modern. 6/2 x 100
	Total	Surface	Ground		Surface Gravity	Modern	
1	2	3	4	5	6	7	8
Australia	1.81	1.71	0.10	5.5	1.791	.019	1
Austria	.08	.00	.08	90	N	.08	100
China	50	36.7	13.3	27	48.62	.83	1.4
Cyprus	.033	.014	.019	57.5	.001	.032	97
Egypt	3.23	2.78	0.12	3.7	2.78	.45	14
France	2.37	INA	N	–	1.25	1.12	47
Germany	.53	.106	.424	80	–	.53	100
Italy	2.71	N	N	–	N	.345	13
Indonesia	N	N	N	–	N	N	N
Israel	.22	.075	.105	47.7	–	0.22	1
India	76.16	37.58	38.58	50.6	N	0.78	.1
Korea	.956	.801	.155	16	.95	.006	.6
Malaysia	.294	.294	N	–	.294	N	–
Mongolia	.035	.034	.001	28	N	.032	91
Nigeria	N	N	N	–	N	N	N
Pakistan	13.96	10.47	3.49	25	13.96	Exp	–
Slovenia	.006	.001	.005	23.3	N	.005	82
South Africa	1.22	1.0	.22	18	.5	.72	60
Spain	3.4	N	N	–	2.268	1.132	33
Thailand	4.835	4.835	N	–	N	N	N
Turkey	3.8	3.4	.4	10.5	3.75	.050	1.3
UK	N	N	N	–	N	N	N
USA	19.99	11.34	8.64	43	14.72	5.27*	27

* Includes sub-surface irrigation, N = Not furnished, Exp. = Experimental

Table 1. Current supply, withdrawals, use and irrigated areas

Country	Current Supply BCM					Anticipated Supply BCM (2015)					Current withdr. BCM (1995)	Current allocation to irrigation BCM (1995)		Antici. withdr. 2015 AD BCM (2015)	Antici. alloca. to Agr. BCM	Irrigated area M.ha	
	SW	GW	RU	DS	Total	SW	GW	RU	DS	Total		Qty	%			Current (1995)	Antici. 2015
Austria	70	20	–	–	90	–	–	–	–	90	2.55	0.2	8	3.8	INA	.08	.096
China	447	88.5	–	–	535.5	514	108	N	N	622	525	385	73	682	385	50	60.3
Cyprus	60	30	1.6	0.66	91.6	105	30	4	–	139	21	15.5	74	31.1	18.7	.033	.075
France	100	1	7.6	–	108.6	100	1	8.7	–	109.7	5.7	2.4	42	7.2	2.6	2.38	3.98
Germany	<–	<–	N	–>	–>	–>	–>	–	–	–>	52.4	2.1	4	73.3	2.7	.53	.64
Italy	40	12	.5	.05	52.55	46	14.5	.15	–	63.6	44.7	22.9	49	45.3	23	2.71	N
Spain	94.3	20	.86	.03	115.19	–	N	–>	–	–	37.1	24.2	65	37.1	24.2	3.4	3.72
Turkey	95	13.8	–	–	108.8	–	–	–	–	–	40.2	N	N	40.2	–	3.8	5.80
Slovenia	500	–	–	–	500	–	–	–	–	700	N	–	–	–	–	.0065	4.5
UK	INA	–	–	–	–	–	–	–	–	–	11.6	.14	1	11.7	.16	N	N
Chinese Taipei	5.6	7.1	4.9	–	17.6	N	N	N	N	23	17.6	13.5	77	23(2021)	15	.46	0.61
Indonesia	7.25	N	–	–	7.25	<–	N	–>	–>	–>	0.26	N	–	N	–	.08	N
Malaysia	566	64	–	–	630	–	–	–	–	–	11.6	9	77	15.2	10.4	0.29	0.29
Mongolia	.22	.24	.03	–	.49	<–	N	–	–	–	0.47	0.28	60	0.47	0.28	.035	Reducing
South Africa	53.5	5.4	4.6	N	63.5	107	17	N	N	124	21	10.66	51	23	12.7	1.22	1.40
India	362	190	–	–	552	700	350	–	–	1050	552	460	83	750	630	76	139
Pakistan	178	53	–	–	231	–	–	–	–	231	N	131	–	–	–	13.96	20.64
Nigeria	267	53	–	–	320	–	–	–	–	320	8.97	5.46	61	N	N	0.25	0.75
Thailand	210	2.5	–	–	212.5	–	–	–	–	212.5	88.7	48.17	55	118	50.27	4.83	6.10
Bangladesh	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Egypt	55.5	0.7	–	.4	61.5	57.5	1.2	3.4,12.8	.5	75.4	63.3	50	79	85.3	62	3.23	4.07
Israel	.65	1.05	.22	.008	1.928	.6	.92	.50	.08	2.10	1.8	.83	46	2.1	.85	.22	.22
Korea	23.2	1.7	N	N	24.9	29.5	2.15	–	–	31.6	30.2	21	69	42.8	21	.96	0.63
Australia	117.6	2.04	–	–	119.64	120	5.6	Yes	–	125.6	16.84	16	95	18.5	17.7	1.80	2.34
USA	<–	<–	N	–>	–>	–>	–>	–>	–>	–>	563.5	195.5	35	788	195	19.99	23.98

RU – Reuse, DS – Desalinated, N – Information not available/not furnished, Antici – Anticipated.

Table 6. Use of waste waters

Country [Total water withdrawn BCM]	Use of Municipal Waste Water Treated		Use of Industrial Waste Water Treated		No. of sewage effluent treatment plants providing irrigation water	Treatment capacity BCM	Cost of treatment US $ per cum		
	Purpose	Qty BCM	Purpose	Qty BCM			Municipal	Industries	Sewage
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Australia [16.84]	Recreation, back to river, pastures and farms, forestry	–	–	–	–	–	0.385	0.385	0.385
China [525]	Agriculture	–	–	3.1 treated + 2.9 others	–	2.95	.1	.1	.03 (Irrigation)
Cyprus [21]	Gardens, grounds, agriculture	–	–	–	346	1.66	–	–	–
Egypt [63.3]	Agricultural ground water, agricultural drainage	3.8, 0.4, 4.5 = 8.7	Agriculture	0.4	22	.45 MM^3	–	–	–
Italy [44.7]	Irrigation	40%	Irrigation	35%	–	–	0.26	0.19	0.32
Israel [1.8]	Farming	0.22	–	–	80	–	0.1 to 0.25	1 to 15	0.1 to 0.3 (For irrigation)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Mongolia	–	–	–	–	–	–	.042	.15	–
South Africa [21]	Return to river	55%	Industrial use, irrigation	5%, 5%	–	–	↔	0.28	↔
Spain [37.1]	Farming, Golf course	0.59, 0.01 = 0.60	–	–	–	0.059	↔	0.25 to 0.60	↔
USA	Ground recharge, agriculture, land scapes, industries.	0.778, 0.803, 0.574, 0.360 = 2.515	–	–	–	–	–	–	–

Table 10. Water charges in US $ per cum (1995)

Country	Rural domestic	Municipal domestic	Industry		Irrigation	Others	Kind or rates	GNP per cap. (1994) US $	Remarks
			Self	Supplied					
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Australia	.01 to .12	.2 to .5	.1 to .12	. 1 to .5	.005 to .07	–	Block	17980	
Austria	<– 0.5 to	1.5	–	0.5 to 1.0	.10	–	–	24950	
China	.01	.04	.01	.10	.0025 – .012	–	–	530	
Cyprus	–	8.2 per BCM per month	.33	.66	.11 to .14	–	Block	8955+	
Egypt	–	.05	<– .10	–>	Nil	–	Flat	710	
France	.5	.5	.3	.18	.7	.70		23470	
Germany	1.5	1.5	–	–	.1 to .5	–		25580	
Italy	.4	.7	.7	.04	.1	–	Local basis	19270	
Indonesia	0	.008	.013	–	0	–	Block	980	
Israel	.84	.34	<– 0.26	–>	.16 to .19	–	Block	14410	
Korea	<–	.27	–	–	Nil –>	–	–	8220	
Mongolia	–	–	,042	.15	–	–	–	340	
Nigeria	–	2/month	–	–	10/season/ha	–	–	280	
Pakistan	–	–	–	–	3.7/ha	–	Flat	440	
India	–	–	–	–	Crop & area	–	Flat	310*	* Varies, State to State
Slovenia	<– User pipe	dia	–	–	–	–>	–	7140	
South Africa	Scheme and	– user –	specific	–	–	–>	–	3010	
Turkey	–	–	–	–	.005	–	Flat for irrig.	2450	
USA	–	–	–	–	.02 to .2	–	Flat for irrig. based on local supply	25860	
Spain	0.25	0.75	Wide	range	–	–	–	–	

Note : Block rate means rates charges on quantities in blocks.
Flat rate means rate is without consideration of quantity used.

Tabulated Summary of Responses to Watsave Questionnaire from the responding ICID Committees

Country	IRRIGATED AREA					Irrigation Practices (ha)					
	TIA ha	SW ha	GW ha	Others ha	Future % per year	BI	CI	FI	SP	Others	Future % ha ± yr
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1. Australia	1994 1.81 M	1.71 M	0.108 M	–	+5	–	–	–	–	–	–
2. Austria	80000	8000	72000	–	<1	–	–	–	7600	4000	Spr. <1 Drip >1-5
3. UK	–	–	–	–	–	–	–	–	–	–	-
4. China	1993 50 M	36.7 M	13.3	–	+1	20 M	26.7 M	2.5 M	0.8 M	.033 M	0.26 M .13 M/yr
5. Cyprus	1994 33000	14300	18500	200	<1	–	–	1650	24760	6600	Spr. 2 Drip 2
6. Egypt	1996 3.23 m	2.84 M	0.12 M	0.26 M	+1.3;+0.5 +4.2;+8.5	←	2.78 M	–	0.45	–	Micro 9.3
7. France	1993 2.375 m	–	–	–	+80000	–	–	–	1.16	–	–
8. Germany	531120	20%	80%	5000 (Reuse)	+5000	–	–	–	0.53 M	1120	Spr. 5000 /yr
9. Italy	16700 ombrie (1982)	15600	1100	–	4000	–	–	–	850	150	–
10. Indonesia	1994 81360 Brantas	81360	–	–	–	–	–	–	–	–	–
11. Israel	220000	75000	105000	40000 (Reuse)	+900 (Reuse)	–	–	–	65000	155000	No change
12. India	1994 76.1 m	37.5	38.6	–	–	–	–	–	–	–	–
13. Korea	1994 956000	801000	155000	INA	-20000; -16740; -2200	956000	–	–	← 5810 →	–	BI -2 Micro +1/2
14. Malaysia	1994 294000	294000	–	–	No change	294000	–	–	–	–	–

Tabulated Summary of Responses to Watsave Questionnaire from the responding ICID Committees

Country	IRRIGATED AREA					Irrigation Practices (ha)					
	TIA	SW	GW	Others	Future % per year	BI	CI	FI	SP	Others	Future % ha ± yr
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
15. Mongolia	1994 35652	34180	1247	–	(-) 50; (-) 40; (-) 50.4	–	–	3032	32600	–	–
16. Nigeria	250000	70000	180000	Nil	SW +7 G/W +11	–	–	–	–	–	–
17. Pakistan	13.96 M	10.47 M	–	3.49	+2.5	–	–	12.71	–	–	–
18. Slovenia	6500	500	6000	–	SW 30% GW 5%	–	–	–	>5500	<1000	Spr 70 Micro 30
19. South Africa	1990 1.22 M	1	.2	–	SW(-)1%, Ruse+5%	300000	–	200000	670000	150000	Spr -15; Mirco +1; Others +1; DI - 15
20. Thailand	1994 4.835 M	4.835 M	–	–	.22 M	4.835 M	–	–	–	–	0.22 M /yr
21. Turkey	3.8 M	3.4 M	0.4 M	–	0.1 M	–	3.75 M	–	49000	877	–
22. USA	1992 19.99 M	11.35 M	8.64 M	–	< 1	–	–	11.11 M	3.38 M	0.338 M	BI, CI Misc. 10%
23. Spain	3.4	2.17	.919	.3	1000	–	–	.9	.3	–	–

BI = Border Irrigation; CI = Contour Irrigation; FI = Furrow Irrigation; SP = Sprinkler System; MIC = Drip System

2

Country	WATER QUALITY					
	Limitation in the quality for use of water	Survey for water pollution	Point source of pollution	NP sources of pollution	Monitoring authority for pollution	Water quality standards
	(13)	(14)	(15)	(16)	(17)	(18)
1. Australia	Generally No	Done	Waste dishcarge	Nutrient dis.	State Environment Protection Agency	Established
2. Austria	–	Done	Muni, Indus	Landuse NH_4 Nitrate, Pesticides	Federal Min of Agr & Forests	Established
3. UK	YES	–	–	–	–	Established
4. China	YES	Done	COD, BOD, Heavy metals, Phenols	NH_4, I & P	National Environment Protection Agency (NEPA)	Established
5. Cyprus	–	Done	–	–	MoL, Munic. [I M] MOAG.	Established
6. Egypt	–	Done	Agr. drainage, Indus, Sewage, Thermal	Agri. land GW flux	MOPW&WR, MOH Environment Agency	Established
7. France	YES	Done	Collection, Indus	Agr.	Environment agency	Established
8. Germany	–	Done	–	–	Public Law	Established din - 19650
9. Italy	YES	Done	Chem, Indus, Urabn dis. Intensive farming	Fertilizers, Agr. Water	MOPH	Established (LM 60, LN 319)
10. Indonesia	YES	Done Only for industries	Industries	–	BAPPEDAL	Established
11. Israel	–	Done	Indus, Waste water dairy piggeries runoff drai. waste	Fertilizers & pesticides	Ministry of Environment Water Comm.	–
12. India	YES	Done	Indus, Munci. Agr. runoff	–	Pollution Control Boards	Established
13. Korea	YES	Done	–	–	Ministry of Environment	Established
14. Malaysia	–	–	Waste discharge from identified points	–	DOE	–

2

Country	WATER QUALITY					
	Limitation in the quality for use of water	Survey for water pollution	Point source of pollution	NP sources of pollution	Monitoring authority for pollution	Water quality standards
	(13)	(14)	(15)	(16)	(17)	(18)
15. Mongolia	YES	YES	Waste water plant, mining, leather indus	Munic., Agr., Live stock	–	–
16. Nigeria	–	–	–	–	FEPA	–
17. Pakistan	YES	YES	Rise in G/W, Salinity waterlog, drainage, Indus	–	Provincial Water Development EPA, Local Munci.	–
18. Slovenia	YES For drinking supply	YES	Munci. Indus, big farm	Intensive agr.	Hydrometeorology Institute	–
19. South Africa	YES	YES	Waste discharge from identifiable units	Diffused water reaches sand runoff and others	Deptt. of Water Affairs and Forestry	Established
20. Thailand	YES	YES	–	–	–	–
21. Turkey	–	–	–	–	Exists	Established TS-266
22. USA	YES	YES	Bactaria, Viruses organics, nutrients, heavy metals, suspended solids	Siltation, Pathogens, Pesticides, organic material and nutrients	Exists	Established
23. Spain	–	YES	–	–	River Basin Agencies	Established

Country	WATER SAVINGS				Reasons for losses or excessive use	Canals Lined or Unlined	Survey for losses in canals	Cost of lining – USD per km
	Survey for losses on farm	Expected savings m^3/ha/yr	Agency for monitoring water Savings	3 most suitable irrigation methods				
	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
1. Australia	Carried out	S. Cane 1-3000; Cotton 1-2000; Horticulture 500-1000	Established in States	Tirckle/Drip, improved flood irrig. mgmt., irrig. scheduling	Poor flooding; G/W accession; Low water price; Others not given	Partially lined	Conducted	1.125 M/km; 45000; 6000 FC
2. Austria	Carried out	Pressure irrigation gives good efficiency	Established	Sprinkler; Drip; Micro	–	Fully lined	–	Pressure Conduit; 400 mm – 0.1 M/km 200 mm – 0.04 m
3. UK	–	–	–	N	–	–	–	–
4. China	Carried out	Rice 1350; Wheat 600; Cotton 500	Established	Small border; short furrow; improved mgmt. & design; sprinkler/micro	Losses from filed ditches, lesser uniformity and efficiency improper scheduling and mgmt.	Fully lined	Lined 20-30% Unlined 40-50%	0.25, 0.15, 0.10, 0.01 M
5. Cyprus	Carried out	Modern method & good efficiency	Established	Sprinkler; Drip; Hose basin	Improper irrig. sys.; Inefficient dist.; Farmers ignorance	Fully lined	–	No canals are taken up anymore
6. Egypt	Carried out	S. Cane 10-20%; Wheat & Cotton 15-20%; Rice 15-20%	Established	Improved MC&Distr., Telemetry, Land levelling & night irrigation	Flood irrig. practices, Neglected night irrig., Unofficial rice cultivation, Lack of knowledge and insufficient farmers participation	Partially lined	Lined – 3% of cap. Unlined 20% of cap.	0.25 m to 0.3 m, 0.2 to 25 & 0.15
7. France	–	–	–	INA	Wind drift, orver irrigation	MC 100% Others 50%	MC 25000 m^3 Others 2 to 7 MCM	1200 per $10m^3$ 800 per $4m^3$
8. Germany	–	–	–	N	Low uniform sprink, High dosage, Evap. & runoff	Not applicable	–	–
9. Italy	Carried out	Tabacco 4000; Maize 3000; S.flower 700; Veg. 500; Trees 900	–	Micro, Sprinkler, Underground	–	Fully lined	–	0.4M, .25M, .075, .05
10. Indonesia	–	–	Established	Flushing, rotation plastic in bottom	Leakage unaccounted	Partially lined	–	Stone/Conc; 80866 - 44724;52193 -29925; 53316 -19825.
11. Israel	Carried out	Motivation for savings	Established	Pressure irrig.; Micro irrig.; Computerised control	Drip, Sprinkler, Rotationa distribution	Fully conduit	0.66 m^3/ msft, 2.44 m^3/ msft of wetted perimeter	Not applicable
12. India	Carried out	–	States	Improper water mgmt., lack of O&M, improper field levelling	–	Partially lined	Conducted	About US $ 47 per cum of lining
13. Korea	–	–	–	–	–	Partially, MC-10%, DC-50%	25000 cum/km, .2 to .7 MCM/km	–
14. Malaysia	YES Carried out	YES grain harvesting	–	–	–	MC&DC unlined, FC lined 100%	–	Minor 10000/km FC 9000/km

Country	WATER SAVINGS				Reasons for losses or excessive use	Canals Lined or Unlined	Survey for losses in canals	Cost of lining – USD per km
	Survey for losses on farm	Expected savings m^3/ha/yr	**Agency for monitoring water Savings**	3 most suitable irrigation methods				
	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
15. Mongolia	–	–	–	N	–	Fully	Conducted	–
16. Nigeria	–	–	–	Surface; Overhead; Drip (limited scale)	Lack of O&M, meas, farmers knowhow	Partially lined , MC 80%, Others 40%	Conducted	–
17. Pakistan	Carried out	–	Established	Furrow; Sprinkler; Drip	Seepage evap. uncontrolled water	MC 80%, Others 40%	Lined .7 - km^3, Unlined 22 - km^3	12.91/sq. m
18. Slovenia	–	–	Planned	Drip; Micro; Sprinkler	Conduit	Partially lined	–	–
19. South Africa	–	–	–	Drip; Furrow; Dragline sprinkler	–	Conduit	Lined 1.5 L/S per 1000 m^3, Unlined : ± 30%	–
20. Thailand	Carried out	Rice - reduced water for prop.	Established	N	Low efficiency control, coordination, training	MC ±90; Duty 70; MI 40; FC 15 %	–	80/m^3; Concrete
21. Turkey	Carried out	S. Beet 40%; Wheat 50%; Fodder 40%; Cotton 30%	Established	Sprinkler; Drip; Longline border	Losses in conveyance, evap., percolation	Partially lined	–	–
22. USA	(Not at National level)	–	–	–	–	–	Yes	55 m^3/s – 61000; 10 m^3/s – 22200; 1m^3/s – 14700; 0.5m^3/s – 13400
23. Spain	Carried out	–	Hydrographic confed.	–	Pricing by land area, lack of incentive to save faulty grading, in appropriate methods, rigid rotational schedule	Fully lined	–	.13 M, .07, .01

Country	RESERVOIR LOSSES				BY USE OF MUNICIPAL AND INDUS WASTE WATER		
	Survey	Summer	Winter	Measures in practices for reduction	Survey to assess available/potential	Users of treated water	Users of untreated water
	(27)	(28)	(29)	(30)	(31)	(32)	(33)
1. Australia	Done	–	–	No attempts made Clay lining - small reservoirs	YES, Done	Recreation, Return to river pastures & farms forestry	–
2. Austria	Not applicable	–	–	–	–	Agr.	–
3. UK	–	–	–	–	–	INA	–
4. China	–	–	–	–	Done	Indus, and Irrigation – 2.9 km^3	In irrigation – 3.1 km^3
5. Cyprus	Done	9.03 km^3	3.35km^3	No attempts made so far for reduction	Done	Gardens, grounds, irrigation for agriculture	–
6. Egypt	Done	2km^3/yr	10 km^3/YR (Naser lake)	Reducing lake surface area, Weed control & channel cleaning	Done	In agriculture – 0.4 km^3 In indus – 0.4 km^3	–
7. France	Done	600 mm	900 mm	Control of water tightness no other measure developed	–	–	–
8. Germany	–	–	–	–	–	–	–
9. Italy	Done	8.5 km^3	4.5 km^3	–	Done	In irrigation 40% In indus 35%	–
10. Indonesia	Done	←	.073 km^3 →	–	–	–	Waste water flows to river, users extract water from river
11. Israel	Done	0.17 $\kappa\mu^3$ (170 MCM)	0.08 km^3 (80 MCM)	Plastic lining to reduce infiltration	Done	In farm irrigation – 0.22 km^3	–
12. India	Done	← 27 km^3	→	Use of retardants constructing of dykes integerated operation to deplete shallow water	–	In irrigation	In irrigation
13. Korea	Done	–	–	Reservoir operated by T/L, T/M Rotating supply of water	–	–	–
14. Malaysia	–	–	–	–	–	–	–

4

Country	RESERVOIR LOSSES				BY USE OF MUNICIPAL AND INDUS WASTE WATER		
	Survey	Summer	Winter	Measures in practices for reduction	Survey to assess available/potential	Users of treated water	Users of untreated water
	(27)	(28)	(29)	(30)	(31)	(32)	(33)
15. Mongolia	–	–	–	–	–	–	–
16. Nigeria	–	–	–	–	–	–	–
17. Pakistan	Done	←	3.16 km^3 →	–	–	–	–
18. Slovenia	–	–	–	–	–	Not reused directly	–
19. South Africa	Done	←	1700 mm → per annum	Water scoring by Sys. oper. policy ± 20%	Done	To river – 55%, To sea – 25% Reused in irrigation – 5% for Indus – 5%	–
20. Thailand	–	–	–	–	–	–	–
21. Turkey	–	–	–	–	–	–	–
22. USA	(Not at NL)	–	–	–	–	For G/W Recharge – 0.78 km^3, Agr. – 0.60 km^3, Landscape – 0.57 km^3 , Indus – 0.38 km^3	Treatment is required
23. Spain	Done	Humid .001 km^3/km^2	Dry .002 km^3/km^2	–	Assessed	.059 km^3 For irigation .010 km^3 For Golf courses	–

NL = Natural level

Country	URBAN AREA EFFLUENT AND IRRIGATION WATER EXCHANGE						Legal responsibility of Muncipality	Agency monitoring
	Facility available							
	Number	Capacity	Used Capacity	Cost USD	Major consumers	Treat. of M&I Cost USD		
	(34)	(35)	(36)	(37)	(38)	(39)	(40)	(41)
1. Australia	–	–	–	–	ALL	0.385 cum	YES	Dept. of Land & EPA
2. Austria	–	–	–	–	Priority to irrig., Golf courses	–	YES	Water quality 1-5 years
3. UK	–	–	–	–	–	–	YES	Envi. Agency
4. China	–	–	2.95 km^3	0.1/m^3	Irrigation	0.10/m^3 forIndus 0.030 for Irrg.	YES	NEPA
5. Cyprus	346 nos.	1660 – MCM	–	–	Landscape	–	YES	MOAG, MONR, EA
6. Egypt	22 nos.	450000 m^3/Day	NA	800/m^3 (Constn. & O&M)	Landscape irrig. veg. indus	–	YES	MOPWWR, Daily EEAA - yearly
7. France	Not done in France	–	–	–	–	–	–	–
8. Germany	–	–	–	–	–	–	–	Public Law
9. Italy	–	–	–	–	–	0.26 Munic 0.19 Indus	YES	MOPH & Mayor Annual
10. Indonesia	–	–	–	–	–	–	YES	Env. Control Body JASA, TIRTA
11. Israel	80 nos. (Urban)	0.45 km^3	NA	0.15 to 0.25 per cum	Suitable crop with water mgmt.	0.10-0.25 Munic, 1 to 15 Indust., Reuse for Irrg 0.1 to 0.3	YES	MO Env. Regular Yearly
12. India	–	–	–	–	Irrig., Veg. Golf courses	–	–	Pollution Control Boards
13. Korea	–	–	–	–	–	–	YES	–
14. Malaysia	–	–	–	–	–	–	–	–

Country	URBAN AREA EFFLUENT AND IRRIGATION WATER EXCHANGE						Legal responsibility of Muncipality	Agency monitoring
	Facility available							
	Number	Capacity	Used Capacity	Cost USD	Major consumers	Treat. of M&I Cost USD		
	(34)	(35)	(36)	(37)	(38)	(39)	(40)	(41)
15. Mongolia	–	–	–	–	–	M – 0.042/m^3 I – 0.150/m^3	YES	Deptt. of Water Faculty Monthly
16. Nigeria	–	–	–	–	–	–	YES	–
17. Pakistan	–	–	–	–	–	–	YES	Muncipal & EPA
18. Slovenia	72 nos.	2.8 MCM (PU)	–	0.2 / m^3	Indus cooling	Per 1000m^3–447; 10000–360; 1X105–254; 5X105–175	YES	Hydro Meteorologic Institute
19. South Africa	–	–	–	–	Clooling, land-scaping, Golf. irrig.	0.28/M^3	YES	DWAF Daily to quarterly
20. Thailand	–	–	–	–	–	–	–	–
21. Turkey	–	–	–	–	–	–	–	–
22. USA	–	–	–	–	–	–	YES	EPA Daily, annually
23. Spain	–	.069 km^3	–	–	Irrigation .059 Golf courses .010	0.25 to 0.60 per m^3	YES	–

6

Country	By use of saline/brackish sea water		Resulting cost USD/Cum		State Funded Prog. for use of desalinated water	Priority for Modern Irrigation Practices			
	Survey to find potential use	Area irrigated	Sea water based	Land based		Most promising (Priority)			
						Sprinkler	Micro	Surface	Others
	(42)	(43)	(44)	(45)	(46)	(47)	(48)	(49)	(50)
1. Australia	YES	–	1.6 to 2.5	–	–	3	2 (Trickle)	1 (Improved)	–
2. Austria	–	–	–	–	–	1	2	Others	–
3. UK	–	–	–	–	–	–	–	–	–
4. China	–	67000 ha	–	–	–	3	4	1	2 (Pipe)
5. Cyprus	YES	Potential found	–	–	–	2	1	–	–
6. Egypt	YES, In coastal areas	Limited to summer resorts	2.0	–	Yes – Research purposes	3	2	1	–
7. France	–	–	–	–	–	1	2	3	4
8. Germany	–	–	–	–	–	–	–	–	–
9. Italy	YES (.05 km^3)	15000 ha (Surface)	4/cum	–	–	2	1	3	–
10. Indonesia	–	–	–	–	–	–	–	–	–
11. Israel	YES (Not for sea water	45000 ha	1.0	0.8	–	2	1	–	–
12. India	–	–	–	–	–	– (71000 ha)	–	–	–
13. Korea	–	–	–	–	–	10%	10%	80%	–
14. Malaysia	–	–	–	–	–	2	3	1	–

The digits denote the priority indicated.

6

Country	By use of saline/brackish sea water		Resulting cost USD/Cum		State Funded Prog. for use of desalinated water	Priority for Modern Irrigation Practices			
	Survey to find potential use	Area irrigated	Sea water based	Land based		Most promising (Priority)			
						Sprinkler	Micro	Surface	Others
	(42)	(43)	(44)	(45)	(46)	(47)	(48)	(49)	(50)
15. Mongolia	–	–	–	–	–	2	3	1	–
16. Nigeria	–	–	–	–	–	2	3	1	–
17. Pakistan	–	–	–	–	–	–	–	1 (Furrow)	–
18. Slovenia	–	–	–	–	–	2	1	–	–
19. South Africa	YES	Insignificant	780/1000 m^3	200/1000 m^3	–	3	1	2	2 (Drip)
20. Thailand	–	–	–	–	–	4	3	1	–
21. Turkey	–	–	–	–	–	–	–	–	–
22. USA	–	–	–	–	–	2	1	3	–
23. Spain	YES	–	0.6 to 1.4	0.2 to 0.8 (Saline)	Incentives in same region	2	1	Land grading	–

The digits denote the priority indicated.

7

Country	5 CROPS UNDER MODERN METHODS			Increase in last 3 years	HYBRID CROPS THAT USE LESS WATER			
	Covered by sprinkler ha	Drip area ha	Others ha		Name	Water saving cum/ha	Yield increase kg/ha	Reqts. of water for new crop cum/ha
	(51)	(52)	(53)	(54)	(55)	(56)	(57)	(58)
1. Australia	Tree Crops, S. Cane & Veg. 0.15 M	41 Th.	–	Increased noticed	Sorghum, S.bean, Peanuts, S. cane	100, 500 to 1000, 200, 300	200, 1000, 250, 500	3500, 4000 5000, 6 to 8000
2. Austria	Grain 20000, S.Beet 20000, Other 35000	Vine 2000 F & G 1000	1000 F & G	–	–	–	–	–
3. UK	–	–	–	–	–	–	–	–
4. China	Wheat 0.67 M Orchard 0.67 Th.	Wheat 13400 Orchad 26700	Veg. .6670	–	–	–	–	–
5. Cyprus	Pot. 8000, Cit. 7150, Veg. 2600, Dec. 2750	2000	Greenhouse 480	Citrus 8% Dec. 18%, Veg. 8%	–	–	–	–
6. Egypt	Orchard, Veg. Fruits 0.45 M	–	–	9.3% OR 0.04 Mha/yr	Rice, GRA 178	5000	10-20%	15000m^3
7. France	979000 (Crops)	284000 (Arboriculture)	–	–	–	–	–	–
8. Germany	500000 Ag. crops	–	Greenhouse etc. 30000	–	–	–	–	–
9. Italy	Maize, Tomato, Veg. Sunflower & Trees 0.253 M	0.07 M	0.022 M	–	–	–	–	–
10. Indonesia	–	–	–	–	–	–	–	–
11. Israel	Orchard 30000, 50000, Field crops	0.14 M Cotton, Veg. & field crops	–	–	–	–	–	–
12. India	← Tea, coffee, card. & others 0.74 M. ha	→ Orch.,plant. .048 M.ha	–	–	–	–	–	–
13. Korea	–	–	–	–	–	–	–	–
14. Malaysia	Veg., Flowers, Fruits	–	–	–	–	–	–	–

Country	5 CROPS UNDER MODERN METHODS			Increase in last 3 years	HYBRID CROPS THAT USE LESS WATER			
	Covered by sprinkler ha	Drip area ha	Others ha		Name	Water saving cum/ha	Yield increase kg/ha	Reqts. of water for new crop cum/ha
	(51)	(52)	(53)	(54)	(55)	(56)	(57)	(58)
15. Mongolia	Veg. 1000, S.beet 500	S. beet 600	–	S. beet	–	–	-	–
16. Nigeria	Suger Vegetable	Orchard S.	–	–	–	–	–	–
17. Pakistan	Nil	–	Furrow	Experimental	Under Researach	–	–	–
18. Slovenia	Orchard 3000 Field 500	Veg. 1000	–	–	–	–	–	–
19. South Africa	Wheat, Maiz, S. Cane, Vines? & Lisc. 575000	23000, Vines, & S. Cane	–	–	–	–	–	–
20. Thailand	Duriam, Ranbutaes, Orange, flowers	–	–	Fruits / crops	–	Saving is there	–	–
21. Turkey	–	–	–	–	Developed	–	–	–
22. USA	Corn, Alfalfa, Orchad, Veg. →	2.26 Mha, 1.05 Mha, .55 Mha, .48 Mha, .38 Mha	10152, 11154, 109341, 834, 34444 & 4977	–	Developed	–	–	–
23. Spain	Maize, colives, beats, vineyards	–	–	Increase noticed	High yield or high value crops	–	–	–

Country	Agr. Inst who develop crops for less water	Nature of coordination	Agency for coordination	Who lays down reqt. of water	Whether water audit done/agency	Frequency	MANAGEMENT OF IRRIGATION SYSTEM		
							Who operates irrig. systems	Funding of OM&M	OM&M funds determination
	(59)	(60)	(61)	(62)	(63)	(64)	(65)	(66)	(67)
1. Australia	HRS, CSIRO, JBRS, CRC, DDR, MUR	Very little between Engrs. & Scientists	–	Local State Govt., Deptt ofWater & Rural Water Authority	–	–	Govt. 60%, User 20%, Joint 20%	Govt. 12%, Direct 80%, Others levy 3%,	By need & to some extent on historic level
2. Austria	–	–	–	Federal Ministry of Health – ALL	Done	As per legal procedure	User 100%	Users 100%	By need
3. UK	–	–	–	–	Done, Envi. Agncy	Yearly	User operated	–	Env. Agency changing scheme
4. China	–	–	–	MOWR & M O Const.	Done MOWR	States	Govt. >50%, User 25%, Joint <25%	Govt. 80% Direct 20%	By need
5. Cyprus	–	Mutual Coop.	WDD & Local aut. h.	Local agencies and DO Agr.	Done WDD	Yearly	Govt. & users	Govt., Direct, other levies	By need & historic
6. Egypt	AGRC, ICS, WSRI, RRC	YES Multidisciplinary	Membrs of Board Adv. Council	Water Supply Auth., Municip, MOI/Power	Water Supply Authority	Always	Govt. 100%	–	By need ro historic % of capital
7. France	–	–	–	Governed by Demand/Supply	(On actual use)	–	–	Combination	By need historic % of capital
8. Germany	–	–	–	Public regulation	–	–	User one also jointly	Direct payment	Need, % of capital
9. Italy	–	Organisational	National or Reg. Govt.	National or Regional Govt.	Auth. of CA	Annual	Joint operate	–	By need & o/o capital
10. Indonesia	–	–	–	Local Govt.	–	–	Joint operate	–	Need on historic level
11. Israel	Applied esearch Inst. & 3 others	Multidisc. & Org.	ARO, MOA, Agr.	Water Commissioner	All Govt.	Regular	Govt./User/Joint	Govt. 100%	On capital outlay
12. India	CSIR, IARI, RAC	–	CADA & Ext. Unit	Irrigation Authority Muncipality Local agencies	Done	Each crop season	Govt.	Govt. 100%	Historic & by actual need
13. Korea	–	Org.	–	Ministry of Transpt. MOAG, MOAF	–	–	Joint	Govt. 90% Direct 10%	By need
14. Malaysia	–	Multidisc.	MO Agr.	Water Authority	–	–	Govt.	Govt. 100%	By need & historic exp.

Direct % denotes the extent of charges paid by users.

Country	Agr. Inst. who develop crops for less water	Nature of coordination	Agency for coordination	Who lays down reqt. of water	Whether water audit done/agency	Frequency	MANAGEMENT OF IRRIGATION SYSTEM		
							Who operates irrig. systems	Funding of OM&M	OM&M funds determination
	(59)	(60)	(61)	(62)	(63)	(64)	(65)	(66)	(67)
15. Mongolia	P&ARI, WPI, TIPH	Organisational	MOS&E	**Department of Water MOFL Cos.**	Done	3 months	User	Direct 10%, Levies 10%, Profit 80%	Need
16. Nigeria	IAR, NCR, NIHR	YES	Federal Ministeries	**Federal MOWR & RD**	–	–	Joint	Govt. 60%, Direct 20%, levies 20%	Historic
17. Pakistan	PARC & U. Ag.	Three extension Service	MOA&F Provn. Irrig.	**Provincial Govt.**	Done by Indus Basin Authority	Biyearly	Govt.	Govt. grant & Water Charges	Historic
18. Slovenia	Bio. Fac. Inst. of Agr. HOPS	–	Experienced specialists	-	–	–	User & Joint	Direct payment	Need
19. South Africa	–	–	–	**Consumer and Demand**	Done	DWAF & Irrg. Weekly	Govt. 346000, ha User 854000, ha Join. 1000000 ha	Budget on Trading a/c DWAF	Need
20. Thailand	–	-	–	-	–	–	–	Govt. 99% Direct 1%	Need
21. Turkey	GDHS	Tech. Research meetings	–	-	–	–	–	–	–
22. USA	Water Res. Colorado, Texas & California	Exists	None, UOAg. & Research Center	**Individual State Govt.**	Done by State Govts.	As needed	Govt./User/Joint	Direct 100%	Need
23. Spain	–	–	–	**River Basin Agencies**	Done	–	>10m^3, RBA <10m^3, IA	Management agencies	Historic

9

Country	WATER CHARGES						
	Basis of water charges	Method of assessment	Collection Agency	Frequency of collection	Sanction for non-payment	Paying person	Where does the money go
	(68)	(69)	(70)	(71)	(72)	(73)	(74)
1. Australia	On historic land & inflation	-	Done by Govt. mostly	Mostly annual	Withdraw service Legal	Land owners	Mostly Govt. O&M mostly
2. Austria	Average cost pricing	On volumetric basis	WUA	Annual / monthly	Legal proceedings	mostly Land owners	WUA
3. UK	Environment Agency	On duration of supply	Govt. Agency	Yearly	Licence is revoked	Licence Holder	NEA fund
4. China	Charging scheme Historic & Inflation	On land area; Measured discharge; Duration; Volumetric	Other Agency WUA	Annual	Withdraw Service, legal acts	Land owners, Farmers group	Govt. gen. revenue
5. Cyprus	–	Criteria and guidelines	Jointly with Govt.	Yearly bi-monthly	Withdraw service legal action	Land owners	WUA & others
6. Egypt	No charge, cost recovery for improve-ment after 5 yrs	–	No charges	–	–	–	–
7. France	Ave. cost pricing opportunity cost	On crop area	Water Agencies	Yearly	–	–	Water agencies
8. Germany	ACP	On measured discharge	Other agency	Yearly	Withdraw service & legal action	Land owners, Tenant	WUA
9. Italy	ACP	By permit/ discharge	Govt. agency	Yearly	Withdraw service	Permit holder	WUA
10. Indonesia	Mutual Agr.	On crop area	WUA	Yearly	Withdraw & legal action	Tenants	WUA & Govt.
11. Israel	Perceived affordablility	On volumetric basis	Water supply Co.	Bimonthly	Withdraw Service & legal action	Land owners	WS Co.
12. India	As per crop type	By crop area	Govt.	Crop season	Legal procedure	Land owners	Govt. GR
13. Korea	–	By crop area	Other agency	Yearly	Withdrawal of service	Land owners	Other agency
14. Malaysia	Historic & affordability	On land area	Govt.	Annual	No Sanctions	Land owners	Govt. GR

ACP - Average Cost Price

Country	Water Charges						
	Basis of water charges	Method of assessment	Collection Agency	Frequency of collection	Sanction for non-payment	Paying person	Where does the money go
	(68)	(69)	(70)	(71)	(72)	(73)	(74)
15. Mongolia	No charge for Agr.	–	–	–	Not needed	–	–
16. Nigeria	Perceived affordability	On crop area	Govt. Agency	Crop season	Withdrawal	Farmers group	Govt. GR
17. Pakistan	Historic & inflation & B. levy	By land area, crop area	Govt.	Twice a year	Legal action	Land owners	Govt. GR
18. Slovenia	Being developed	–	–	–	–	–	–
19. South Africa	Combination of criteria	Combination of methods	Govt. & Irrigation Boards	Annual / monthly	Withdraw service Legal action	Users, Owner, Tenant	Trading Co. A/C
20. Thailand	–	–	–	–	–	–	–
21. Turkey	Average cost pricing, benefits and affordability	On crop area	Operating Authority	In two instalments	–	–	–
22. USA	Average cost pricing	On crop use, volumetric	Other agency	Annual	Withdraw service Legal action	Land owners	Other Agency
23. Spain	Dual payment of actual cost	By land area	50% RBA 50% IA	Once, even twice	Cutting off supply	Irrigator	RBA & Community

GR – General Revenue

10

Country	Water pricing					Is it a flat rate	Compre. water pricing policy	Basin oriented setup
	Present charges USD							
	Rural domest. per m^3	Muncipal domest. m^3	Industrial self/supply m^3	Irrigation m^3 or ha	Others			
	(75)	(76)	(77)	(78)	(79)	(80)	(81)	(82)
1. Australia	0.01 to 0.12	0.2 to 0.5	0.01 to 0.12 0.1 to 0.5	0.005 to 0.07	–	Increasing block	Established	States Exists
2. Austria	0.5	1.5	.5 to 1.0	0.1	–	–	–	–
3. UK	–	–	–	–	–	–	Established Environ. Agency	Yes, By law By Coop.
4. China	0.01	0.04	.01	.0025 to 0.012	–	–	MOWR by law	Exists Coop.
5. Cyprus	8.2 to 8.10 per km^3 per month	.3 to .6	5.7 to 21 km^3	0.11 to 0.14	Live stock 0.26	Increasing block rate	For irrigation it is subsidised & other pay full cost	–
6. Egypt	–	.05	0.10 supplied	No charge	–	Flat rate	MPPWWR	Exists
7. France	0.5	0.5	0.3/0.70	0.18	–	–	Min. of Environ.	Exists
8. Germany	1.5	1.5	–	0.1 to 0.5	–	–	Not for irrig.	–
9. Italy	0.4	0.7	0.70/0.4	0.1	–	Local basin	MOPW	Exists
10. Indonesia	0	.008	0.013	No charge	–	Block	–	–
11. Israel	0.34	0.34	0.26 (self)	0.16, 0.19, 0.26 50%, 30% & 20% of allocations	–	–	Prices determined yearly	Exists
12. India	Variable Place to place source to source	Variable	Variable	Crop based differ from place and source	–	Flat	Established	Exists
13. Korea	–	–	about 0.27	Rice crop is only charged	–	–	Established	Exists
14. Malaysia	–	–	–	–	–	Flat	Economic Planning Unit	–

10

Country	Water pricing					Is it a flat rate	Compre. water pricing policy	Basin oriented setup
	Present charges USD							
	Rural domest. per m^3	Muncipal domest. m^3	Industrial self/supply m^3	Irrigation m^3 or ha	Others			
	(75)	(76)	(77)	(78)	(79)	(80)	(81)	(82)
15. Mongolia	–	–	0.042 Self .15 Supplied	–	–	Flat rate	MONR & Env.	Exists
16. Nigeria	–	2.00 per month	–	10.00 per ha per season	–	–	–	Exists
17. Pakistan	–	Depend on type of crop	–	3.70/ha	–	Crop based	Established	Exists
18. Slovenia	–	–	–	–	–	–	Established	Exists
19. South Africa	User specific	Area and scheme specific	–	Pipe dia and as per quota	–	User specific	Department of Water	Exists
20. Thailand	–	–	–	–	–	–	Royal Irrigation Department, NWRC	Exists
21. Turkey	–	–	–	.005	–	Flat for irrigation, Rest block	–	–
22. USA	Determined by local water supply	–	–	–	–	Flat rates in irrigation	–	Exists
23. Spain	1.25	0.75	Wide range	0.02 to 0.2	–	–	Under process	Exists

11

Country	Responsibility of National Authority				
	For Allocation of water	For Water use monitoring	For Water saving measures	For Evaluation/Authority	Results of evaluation
	(83)	(84)	(85)	(86)	(87)
1. Australia	Yes	Yes	Yes	–	–
2. Austria	–	–	–	–	–
3. UK	Yes	Yes	–	Environment Agency	–
4. China	Yes	Yes	Yes	The Seven river, Basin Committee	Central Management; Create Water Market
5. Cyprus	Yes	Yes	Yes	Planning Bureau MOAG & MONR	–
6. Egypt	Yes	Yes	Yes	MOPWWR	Farmers participation, coord. comm., integerated App., capacity building
7. France	Yes	Yes	Yes	MO ENV.	–
8. Germany	–	–	–	–	–
9. Italy	Yes	–	–	–	–
10. Indonesia	–	–	–	Water Management Committee	No
11. Israel	Yes	Yes	Yes	State Commissioner	Improve mgmt; Conserve water; Long term planning
12. India	States	States	States	MOWR/CWC / States	Drainage and conveyance efficiency, O&M
13. Korea	Yes	–	–	Local Govt. & WR Org.	Waste wash water concept; Unlined canals, ineffective irrigation systems
14. Malaysia	–	–	–	–	–

11

Country	Responsibility of National Authority				
	For Allocation of water	For Water use monitoring	For Water saving measures	For Evaluation/Authority	Results of evaluation
	(83)	(84)	(85)	(86)	(87)
15. Mongolia	Yes	Yes	Yes	–	–
16. Nigeria	Yes	–	–	River basin and rural development authority	Inadequate O&M; Under use of resources
17. Pakistan	Yes	Yes	Yes	River Basin Authority and MOWP	Yes
18. Slovenia	MOEN	–	–	Hydrometeorological Institute	–
19. South Africa	Yes	Yes	Yes	Water Boards and Local Authority	Keep on improving
20. Thailand	Yes	Yes	Yes	–	–
21. Turkey	Yes	Yes	Yes	DSI, GDMS, & Directorate of Rural Development	Involve users; Water saving; Improve farmers management
22. USA	States	States	States	Yes	–
23. Spain	Yes	Yes	Yes	Bureau of Reclamation, Corps of Engineers, Tenn. Authority River Basin agencies	Need to regulate water transfer and strategic use of groundwater

12

Country	Programme for saving water					Does a State sponsored prog. for water conservation exit	Public awarensss		
	National Prog. for Water Savings Name	Cap. outlay USD	Starting year	Target year	Expected water saving		Measures adopted	Evaluation reports	Lesson
	(88)	(89)	(90)	(91)	(92)	(93)	(94)	(95)	(96)
1. Australia	Each State has Program based on considerations	–	–	–	–	YES 'Water wise'	Media & other Means	Conducted	The States have adopted measures
2. Austria	–	–	–	–	–	–	–	–	–
3. UK	–	–	–	–	–	–	–	–	–
4. China	300 counties water savings demos	375 M	1996	2000	6 km^3	YES Dam contd. & G/W recharge	Media & other methods	–	–
5. Cyprus	Improved Water Use Project	–	1965	Contd.	6 km^3	YES	Media conserve & save water	Conducted 5 KM^3	–
6. Egypt	Irrigation Improvement Project	70 M	1984	1996	5 km^3	Water law	Media & others	–	Recently started
7. France	–	–	–	–	–	YES	Media& others	–	–
8. Germany	–	–	–	–	–	Some Studies in hand, water saving 15-20%	Application techno. modified	–	–
9. Italy	Public Law	–	–	–	–	–	–	–	–
10. Indonesia	–	–	–	–	–	Local Law	Media& others	Conducted	Water users knowhow
11. Israel	Public campaign to reduce consumption in drought years	–	–	–	10%	YES Specific decrees to save water	Water scarcity & save water	–	Impact is mea-sured by low use & sale of devices save water
12. India	Participatory water report	–	–	–	–	Yes	Media & others	–	_
13. Korea	–	–	–	–	–	YES	Media & others	–	_
14. Malaysia	–	–	–	–	–	–	Media & others	–	_

12

Country	Programme for saving water					Does a State sponsored prog. for water conservation exit	Public awarensss		
	National Prog. for Water Savings Name	Cap. outlay USD	Starting year	Target year	Expected water saving		Measures adopted	Evaluation reports	Lesson
	(88)	(89)	(90)	(91)	(92)	(93)	(94)	(95)	(96)
15. Mongolia	–	–	–	–	–	YES	Media	–	–
16. Nigeria	Kampa dam & irrigation project	–	1991	1997	0.25 km^3	–	Water Resou. decree	–	–
17. Pakistan	(i) Lining of canals and (ii) Drainage project	735 M 853 M	1995-96 1996	1998 2000	18.465 km^3	YES	Media & others	–	–
18. Slovenia	National Irrigation project	N.A.	1996	2000	N.A.	Water Activity Several rules	–	–	–
19. South Africa	Water Administration System	.07 m	1985	Ongoing	15% of use	Water Act Multidisc. App.	Media & others	Conducted	–
20. Thailand	Change Management Program Pipe Irrigation Study	1.6 k 8 M	1996 1996	1997 1997	N.A.	YES	Media & others	–	–
21. Turkey	–	–	–	–	–	–	–	–	Use of water saving methods
22. USA	–	–	–	–	–	YES	Media & others	Conducted	Role of farmers
23. Spain	–	–	–	–	–	YES	TV, News, NGO & others	Impact is apparent	–

Country	Gender Aspects					Manpower Planning & Capacity Building		
	Traditional Role of Women	Nature of involvement	Training for Womean	Are they in WUA	Any formal act to encourage	Does a manpower policy exist	Quantification of needs for OM&M	Staff in position for irrigation service
	(97)	(98)	(99)	(100)	(101)	(102)	(103)	(104)
1. Australia	–	No seperate role work in Tandem day-to-day work	Imparted	Yes in all capacity	Exists	–	–	Varies from State to State
2. Austria	–	–	–	Yes	–	–	–	Water Mgmt. Dn.
3. UK	–	–	–	–	–	–	–	–
4. China	Yes	–	Imparted	Yes	Exists	Exists	Yes, Blue certificate 1996	Yes
5. Cyprus	Yes	Field irrigation 8-16 hrs	High level	Yes	–	–	–	Directorate of Irrigation
6. Egypt	–	Participate in some activity 1-2 hrs	Limited level	–	–	Exists	Done	MPWWR, Several Units, State Units
7. France	They work as farmers	No specific role	–	Yes	–	–	–	–
8. Germany	Yes	–	Imparted	Yes	–	–	–	No. of posts in State / Region
9. Italy	–	–	–	Yes	–	–	–	Organised by Inde-pendent Agencies
10. Indonesia	No	–	–	–	–	–	Exists	Directorate & Other Officers/Offices in positive
11. Israel	–	–	–	Yes	Exists	–	–	–
12. India	Yes	Assisting 6-8 hrs	–	–	Exists	Exists	Exists	Chief, Supdg., Execu. A.En. & other staff
13. Korea	–	–	–	–	–	–	–	–
14. Malaysia	–	–	–	Yes	–	–	–	–

Country	Gender Aspects					Manpower Planning & Capacity Building		
	Traditional Role of Women	Nature of involvement	Training for Womean	Are they in WUA	Any formal act to encourage	Does a manpower policy exist	Quantification of needs for OM&M	Staff in position for irrigation service
	(97)	(98)	(99)	(100)	(101)	(102)	(103)	(104)
15. Mongolia	–	–	–	–	–	–	–	–
16. Nigeria	Yes	Assistance	Imparted	Yes	–	–	–	–
17. Pakistan	They assist Harvesting/Sowing	Assisting	Planned	Yes	–	Exists	Done	Chief, Supdt., Execu., A.En. & other staff
18. Slovenia	Not yet	Planned	–	Yes	–	–	–	–
19. South Africa	Yes	Furrows ± 3 hrs	Imparted	Members	Exists	–	–	–
20. Thailand	Yes	Assist all activities	Imparted	Yes	–	Exists	Done	Chief of O&M Water Management
21. Turkey	Yes	All activities	Very little facilities	Yes	–	–	–	–
22. USA	–	–	Imparted	Yes	Exists	–	–	State level
23. Spain	None in particular	Harvesting work	–	Yes	–	BEING DEVELOPED	Done	Yes, RBA

RBA – River Basin Agency
Chief – Chief Engineer
Supd. – Superintending Engineer
Execu. – Executive Engineer
Asu. – Associate Engineer