

Challenges and Opportunities for Public-Private Partnerships (PPP) & Support for Environmental Management of Iraq Marshlands – UNEP Iraqi Marshland Project

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Dr. Mushtaq Ahmed Memon

(mushtaq.memon@unep.or.jp)

United Nations Environment Programme

Division of Technology, Industry and Economics

International Environmental Technology Centre



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Presentation Outline

- ❖ Reasons for Public-Private Partnerships
 - What are the challenges and the priorities?
- ❖ UNEP project for Iraqi Marshlands
 - What activities are planned and implemented?

Water Utilities in Asia - I

	Production/Population (m ³ /d/c)	Coverage (%)	Water Availability (hours)	Consumption (l/c/d)	UFW (%) or NRW (%)	Average Tariff (US\$/month)	Water Bill (US\$/month)	Power/water bill ratio	Metering	Operating ratio	Staff/1000 connections	New connections (US\$)	Private sector participation
Manila	0.72	99	24	186	13	0.06	1	15	54	0.37	13.9	66	
Apia	0.67	100	24	337	50	0.05	14	2.6	3	7.73	15.8	28	
Bandung	0.09	42	6	120	51	0.37	8	1.5	100	0.96	7.7	78	Meter/Leaks
Bangkok	0.53	82	24	265	38	0.31	10	3.6	100	0.89	4.6	283	Production
Beijing	0.34	100	24	96	8	0.05	1	6.1	100	1.3	27.2	100	
Bishkek	0.66	98	24	112	47	0.05	1	2.7	1	0.89	6.9	115	Rehabilit
Calcutta	0.26	66	10	202	50	0.01	5	1.2	0	5.25	17.1	40	
Cebu	0.08	23	18	173	38	0.66	15	1.5	100	0.55	9.3	80	Source/Pipe
Chennai	0.07	97	4		20	0.25	3	6.5	1	0.94	25.9	41	Pumping
Chiangmai	0.24	65	20	135	38	0.3	5	3.7	100	0.49	2.9	83	Production
Chittagong	0.14	60	15	139	35	0.12	9	2.2	100	0.56	27.7	69	
Chonburi	0.36	89	16	145	37	0.46	7	3.7	100	0.34	2.6	83	Production / Other
Columbo	0.18	58	22	165	51	0.14	1	8.8	94	0.53	7.3	92	Proposed
Davao	0.13	52	24	145	31	0.27	7	2.4	100	0.83	6.2	42	B&C
Delhi	0.24	86	4	209	44	0.03	2	7.7	73	1.48	21.4	15	
Dhaka	0.09	42	17	95	51	0.09	11	3.4	74	1.01	18.5	29	B&C
Faisalabad	0.09	60	7	170	78	0.03	1	18.5	5	1.41	25	34	

Source: ADB 1997



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Water Utilities in Asia - II

	Production/Population (m ³ /d/c)	Coverage (%)	Water Availability (hours)	Consumption (l/c/d)	UFW (%) or NRW (%)	Average Tariff (US\$/month)	Water Bill (US\$/month)	Power/water bill ratio	Metering	Operating ratio	Staff/1000 connections	New connection (US\$)	Private sector participation
Hanoi	0.22	76	18	45	71	0.11	1	5	25	0.79	13.3	76	
Ho Chi Minh	0.15	52	24	136	34	0.13	6	3.1	100	0.96	6.4	45	Production
Hong Kong	0.4	100	24	112	36	0.56	31	1.2	100	1.63	2.8	147	
Honolulu	0.58	100	23	251	38	0.15	12	1.8	100	1.26	10.7	95	Prod/ Mngt
Jakarta	0.11	27	18	135	53	0.61	18	1	100	0.98	5.9	10	B&C
Johor Bahru	0.37	100	24	193	21	0.39	7	2.1	100	0.61	1.2	50	Prod
Karachi	0.14	70	4	157	40	0.09	5	12.7	1	0.77	8.4	2	Future
Kathmandu	0.11	81	6	91	40	0.14	2	7.8	83	0.72	1.5	49	Mangt / Distr
Kuala Lumpur	0.35	100	24	200	36	0.34	14	2	100	0.6	1.1	4	Prod / B&C
Lae	0.38	62	24	146	61	0.64	52	1.3	100	0.39	17.1	72	
Lahore	0.33	84	17	213	40	0.2	6	4.9	24	0.71	5.7	7	
Male	0.03	100	24	16	10	4086	25	3.3	100	0.6	7.6		Concess
Mandalay	0.14	80	24	110	60	1.2	51	1.6	100	0.22	6.3	485	
Manila	0.26	67	17	202	58	0.23	13	3.2	98	0.65	9.8	95	Concess
Medan	0.13	63	24	131	29	0.27	15	1.3	100	1.2	4.9	81	B&C
Mumbai	0.25	100	5	178	18	0.06	1	7.3	67	1.08	33.3	8	
Nuku'alofa	0.15	100	21	78	45	0.63	14	3.1	100	0.8	1.6	28	

Source: ADB 1997



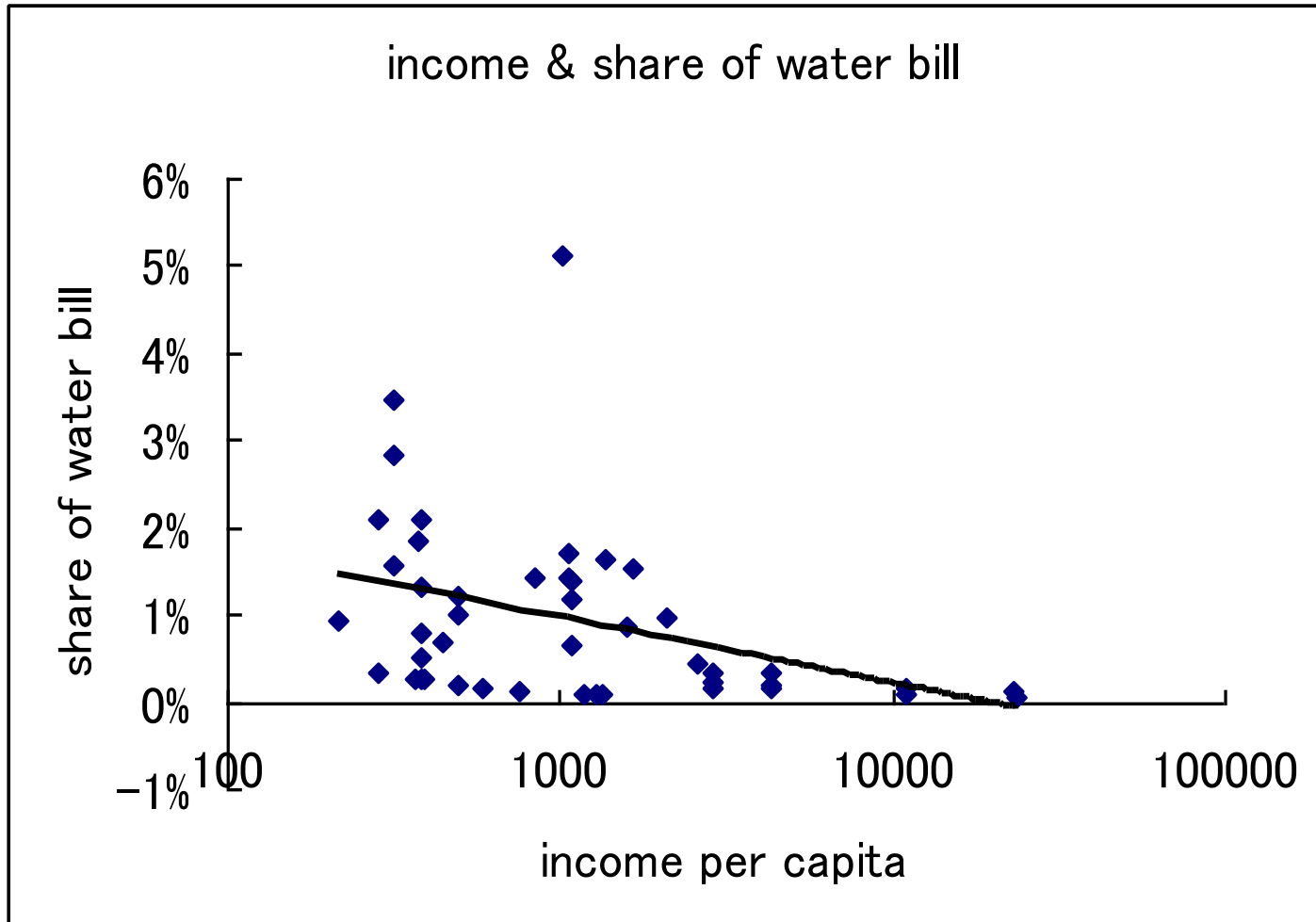
Water Utilities in Asia - III

	Production/Population (m ³ /d/c)	Coverage (%)	Water Availability (hours)	Consumption (l/c/d)	UFW (%) or NRW (%)	Average Tariff (US\$/month)	Water Bill (US\$/month)	Power/water bill ratio	Metering	Operating ratio	Staff/1000 connections	New connections (US\$)	Private sector participation
Penang	0.51	99	24	244	20	0.21	8	4.3	100	0.74	4.4	59	
Phnom Penh	0.12	83	12	32	61	0.15	5	2.3	88	0.61	13.5	164	
Port Vila	0.36	98	24	273	26	0.49	22	2	100	1.12	5	151	Concess
Rarotonga	0.9	100	24	267	70				13		3.5	136	
Seoul	0.47	100	24	209	35	0.28	8	3.3	100	0.84	2.3	1977	Meter Read
Shanghai	0.58	100	24	143	14	0.07	20	4.1	100	1.19	6.1		
Singapore	0.46	100	24	183	7	0.55	12	3.7	100	0.6	2	350	B&C
Suva	0.34	98	24	135	43	0.22	11	2.7	100	1.04	8.9	11	
Taipei	0.72	99	24	262	37	0.39	8	5.5	100	0.69	1.1	1079	B&C / Leaks
Taskent	1.28	98	24	109	63	0.02	1	9.2	2	0.85	17.9	164	
Thimphu	1.28	93	12	93	53	0.05	3	1.9	99	0.6	25.5	70	
Tianjin	0.33	100	24	101	11	0.06	1	3.8	100	1.05	49.9	362	
Ulaanbatar	0.23	100	21	177	49	0.1	1	4.3	14	0.74	579.2		
Ulsan	0.29	84	24	157	33	0.4	16	2.8	100	0.71	0.8	902	
Veintiane	0.26	54	24	172	39	0.13	7	1.7	100	0.95	16.1	88	
Yangon	0.12	60	12	67	60	0.46	19	1.9	7	0.27	12	906	

Source: ADB 1997



Average Tariff in Asian Cities



Who is Paying More for Less - I

Metro Manila (Philippines) — Solis et al. (ADB)

Average HH monthly water bill and consumption

P678 (US\$12) from vendors for 7.88m³

P344 (US\$6.1) from public faucets / pumps for 8.40m³

P414 (US\$7.4) from 2 or more sources including Mynilad for 9.33m³

P263 (US\$4.7) for Maynilad users for 22.45m³

Water in Asian Cities – Manila (ADB)

Small-scale private water providers, serving poor urban areas, may account for as much as 25% of the total volume of water distributed and as much as 75% of total revenue generated

Winnie Flores, whose family pays p1000 (US\$17.8) monthly for accommodation, pays p900 (US\$16) monthly for 6m³ of water

Piped water users pay about p160 (US\$3) monthly for about 30m³



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Who is Paying More for Less-II

Jakarta (Indonesia) — The Jakarta Post

Clean and cheap piped water reaches only to half of 12 million

A lady food shop owner buys at least 10 buckets from private vendors at a cost of Rp20,000 (US\$2.2), spending more than Rp600,000 per month on water

Minimum salary of workers in Jakarta is Rp629,000

A housewife, living up-market, gets 24-hour piped good quality water supply and pays Rp100,000 to 200,000 per month

Another housewife satisfied, as good quality and no smell, spends less than 100,000 per month on piped water



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Who is Paying More for Less - II

COMPARISON OF THE COST OF WATER BOUGHT FROM INFORMAL VENDORS WITH THE COST OF WATER SUPPLIED

City	A	B	Ratio B/A	City	A	B	Ratio B/A
	Cost of Water for Domestic Use	Price charged by informal vendors			Cost of Water for Domestic Use	Price charged by informal vendors	
	(House Connections 10 m3/month)				(House 10 m3/month)		
	US\$/m3	(US\$/m3)			US\$/m3	(US\$/m3)	
Vientiane	0.11	14.68	135.92	Ulaanbaatar	0.04	1.51	35.12
Male*	5.7	14.44	2.53	Hanoi	0.11	1.44	13.33
Mandalay	0.81	11.33	14	Mumbai*	0.03	1.12	40
Faisalabad	0.11	7.38	68.33	Ho Chi Minh	0.12	1.08	9.23
Bandung	0.12	6.05	50	Chiangmai*	0.15	1.01	6.64
Delhi*	0.01	4.89	489	Karachi	0.14	0.81	5.74
Manila	0.11	4.74	42.32	Lae*	0.29	0.54	1.85
Cebu	0.33	4.17	12.75	Chittagong*	0.09	0.5	5.68
Davao*	0.19	3.79	19.95	Dhaka	0.08	0.42	5.12
Chonburi*	0.25	2.43	9.57	Jakarta	0.16	0.31	1.97
Phnom Penh	0.09	1.64	18.02	Colombo*	0.02	0.1	4.35
Bangkok*	0.16	1.62	10				

* Some water vending but not common.

Source: Second Water Utilities Data Book Asian and Pacific Region, Asian Development Bank, October 1997.



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Quality of Service and WTP

Relationship between Quality and WTP: Based on the WTP studies in Pakistan

Public Sector Management
(Accountability is weak)

Low reliability and
quality of water
supply

Higher
costs

Indifferent between canal
water and water supply

Free labor = lower WTP

Lower benefit-cost ratio

Decentralized Management
(Accountability is strong)

Lower
costs

High reliability and
quality of water
supply

Different between canal
water and water supply

Benefits = High WTP

Higher benefit-cost ratio



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Major Challenges for Water Utilities

Efficiency

1. Production costs
2. Un-accounted for water
3. Operating efficiency

Effectiveness

1. Production per population
2. Average tariff and cost recovery
3. New connections



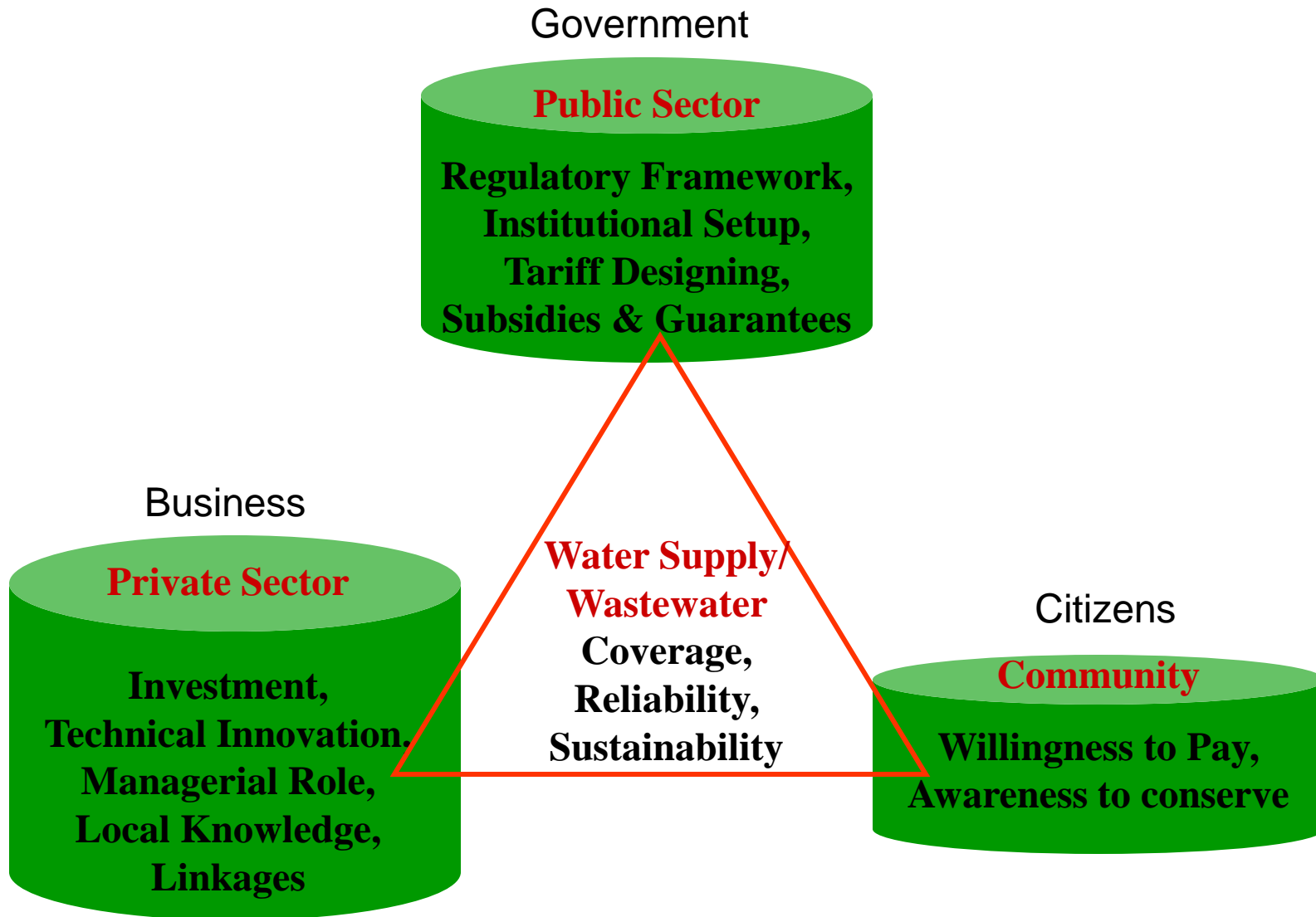
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Targets for PPP in Water Utilities

- Investment: There is a wide gap between demand and supply for water supply and wastewater services, and public sector in most of the countries cannot bridge this gap on its own
- Efficiency: There is no concrete objective evidence to show that water utilities being managed by private sector are efficient then the utilities being managed by public sector. This is mainly due to lack of comparable data. However, there is general consensus that cost of production in public sector is high in various sectors
- Effectiveness: The social surveys usually support the hypothesis that quality of the service is low in public sector, due to quasi-monopolistic nature of public goods, and due to difficulties in “accountability” process within public sector



Role of Various Stakeholders



Three Models for PPP

Private Sector	Mega PPP		Local PPP		Community PPP	
Type of Contract	Conces sion	BOT	Conces sion	BOT	Self Built	Govt. Built
Manila (Philippines)	●					
Macao (China)	●					
Johor Bahru (Malaysia)		●				
Cartagena (Colombia)	●					
Cordoba (Argentina)	●					
OPP – (Pakistan)					●	
Hyderabad (Pakistan)						●
Weihai (China)				●		



Preliminary Assessment

Private Sector	Mega PPP			Local PPP			Community PPP		
Stakeholders	Private Sector	Public Sector	Users Citizens	Private Sector	Public Sector	Users Citizens	Private Sector	Public Sector	Users Citizens
<i>Risk</i>									
Political	H	H	M	M	L	L	M	L	L
Social	H	M	H	M	L	M	L	L	L
Economic	H	M	M	M	L	L	M	L	L
Financial Risk	H	H	H	H	M	M	M	L	L
Legal Risk	H	H	M	M	L	L	M	L	L
Managerial Risk	M	M	M	H	M	H	H	M	M
Technical Risk	M	M	M	M	L	M	M	M	M
Environmental	L	M	H	L	M	H	L	M	M
Physical Risk	M	H	H	M	M	M	M	M	M
<i>Capacity</i>									
Negotiations	H	L	L	M	M	L	M	M	M
Implementation	H	M	L	M	M	L	M	M	M



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Important Lessons – so far

Local govt. decentralization is vital to initiate and implement PSP based projects

Impartial and competent regulatory body should be intact prior inception of PSP

Strengthening the capacity of public sector to negotiate and implement PSP

Investment in local currency to reduce risk of devaluation and tariff-hike

Public awareness and stakeholder involvement for confidence building in PSP

Long-term business goals, rather than short-term profit-making targets

Home-grown private sector and strengthening of local managerial capacity

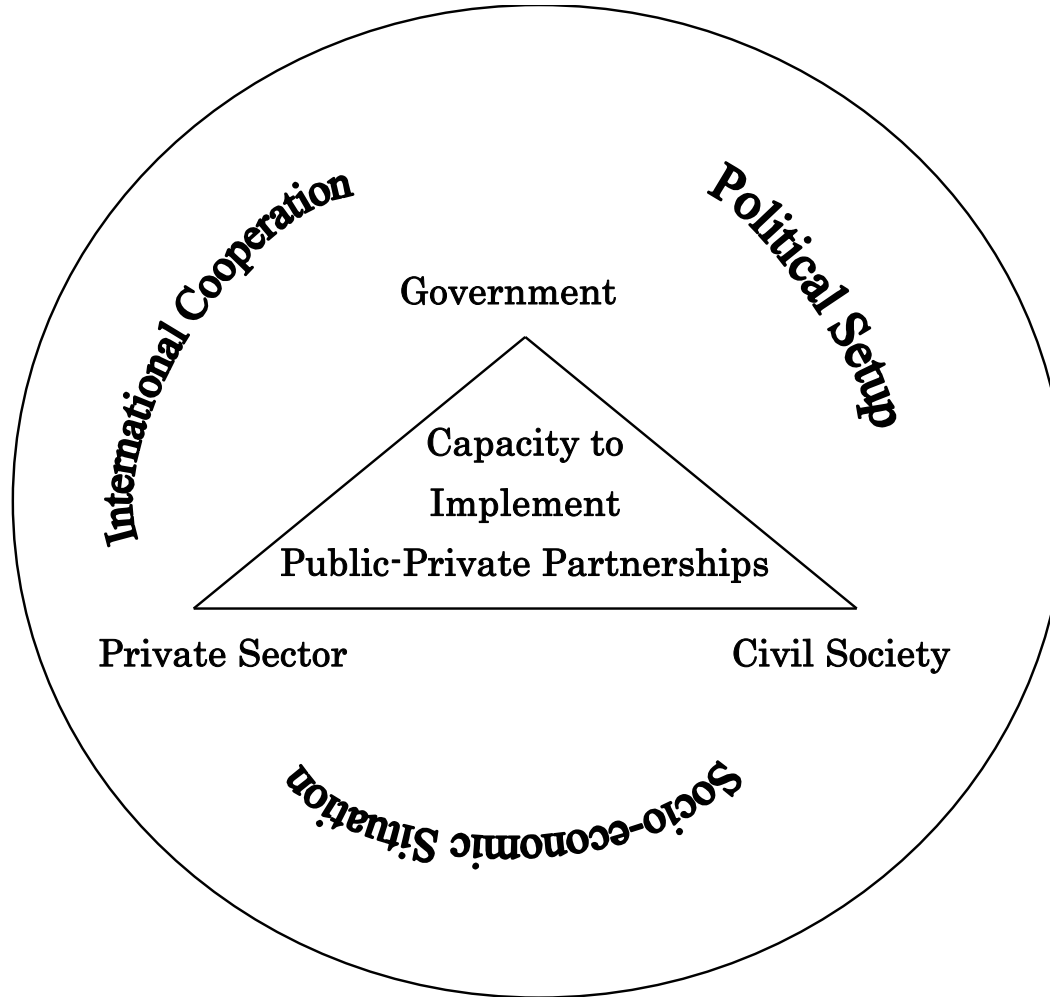
Combination of water supply and sanitation in a single bill to collect the tariff

Appropriate user-charges and subsidies to support ‘cost-recovery’ and ‘equity’



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Role of International Cooperation



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Location of Iraqi Marshlands



Importance of Marshlands

Largest wetland ecosystem
in Middle East & Western Eurasia:

- **Ecological importance**
 - Transboundary water resource
 - Habitat for endangered species
 - Sustain freshwater fisheries & Persian Gulf ecosystems
 - Part of intercontinental flyways of migratory birds
- **Socio-cultural importance**
 - Traditional lifestyle of Marsh Arabs for ~5,000 years
 - Considered by many as the location of Garden of Eden
- **Economic importance**
 - Existence of oil and gas



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Process of Marshland Destruction

Drainage works, irrigation, upstream dam construction



Reduction of wetlands



Degradation of water quality and living conditions,
salt damage, negative impacts on biodiversity



Removal of indigenous peoples (forced and voluntary)



Breached embankments and opened flood gates



Partial re-flooding of wetlands (20 – 30% of original size)



**Return of residents and emerging need
for environmental interventions**

1990s

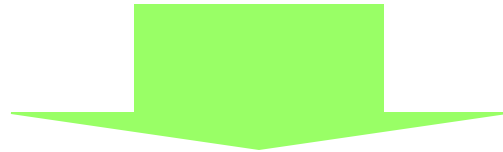
2003~



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How UNEP Became Involved

- ❖ **Marshland issues identified as priority by Iraqi Authorities**
 - Included in list of priority projects submitted to UN Trust Fund for Iraq Reconstruction
- ❖ **Direct appeal to Japanese Government by Iraq**
 - Requested as priority to Japanese Prime Minister by Iraqi delegation, as well as appeal to Foreign & Environment Ministers
- ❖ **Previous experience by UNEP**
 - UNEP responsible for alerting the world on marshland destruction
 - Experience in environmentally sound technology (EST) promotion through IETC
 - Post conflict assessment experience



Funds for project provided to UN Trust Fund by Japanese Government, to be implemented by UNEP

Project Overview

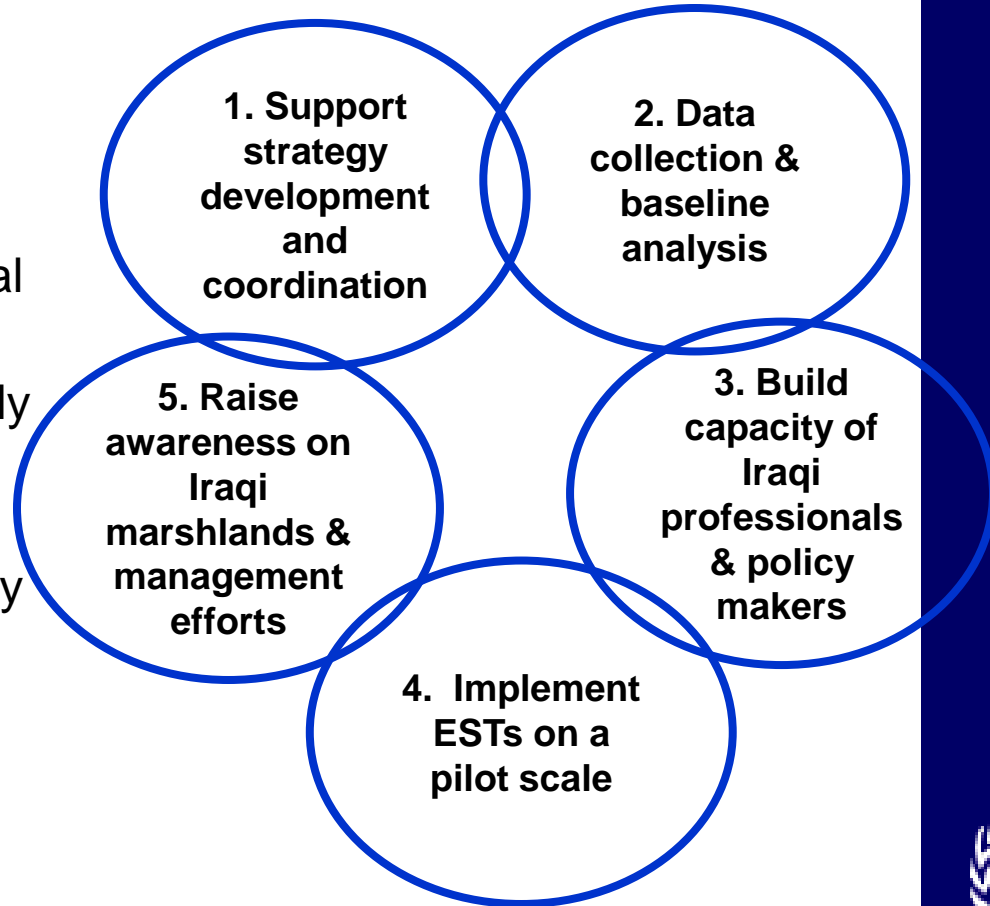
Goal: to support sustainable management and restoration of the Iraqi Marshlands, by:

- assessing current conditions
- building capacity for technical and policy management
- implementing environmentally sound technology (EST) options
- facilitating policy and strategy formulation and coordination

Budget: US\$11 million

Duration: 1 year, to August 2005

Five Activity Components:



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Highlights: EST Pilot Implementation

What? 3 pilot applications (US\$1 million+ each)

Drinking water provision

Sanitation and wastewater treatment provision

Wetland and water quality management

Where? Targeting smaller communities

How? Involvement of Iraqi partners

- **Pilot sites nominated by MoE, MoWR, MoMPW, local communities, and selected based on consensus**
- **Sampling, local training & monitoring organized by Iraqi partners**

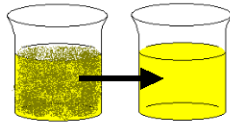
What are ESTs?

- ❖ **Defined and endorsed in Agenda 21**
 - **Range from low- to high-tech**
- ❖ **Suitable for developing countries**
 - **Tend to require less maintenance and skill, culturally acceptable, cost less to buy and operate, create employment**
- ❖ **Suitable options not always intuitively obvious**



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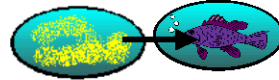
Highlights: EST Examples



Bio Treatment



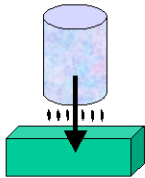
Rainwater Harvesting



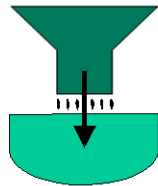
Pond Treatment



Constructed Wetlands



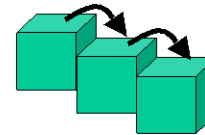
Sand Filters



Simple Filtration



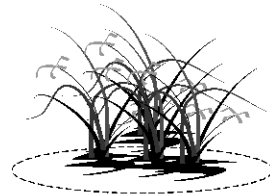
Membrane Filtration



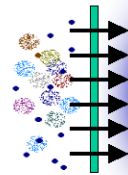
'Jokaso'



Urine Separation



Phytotechnologies



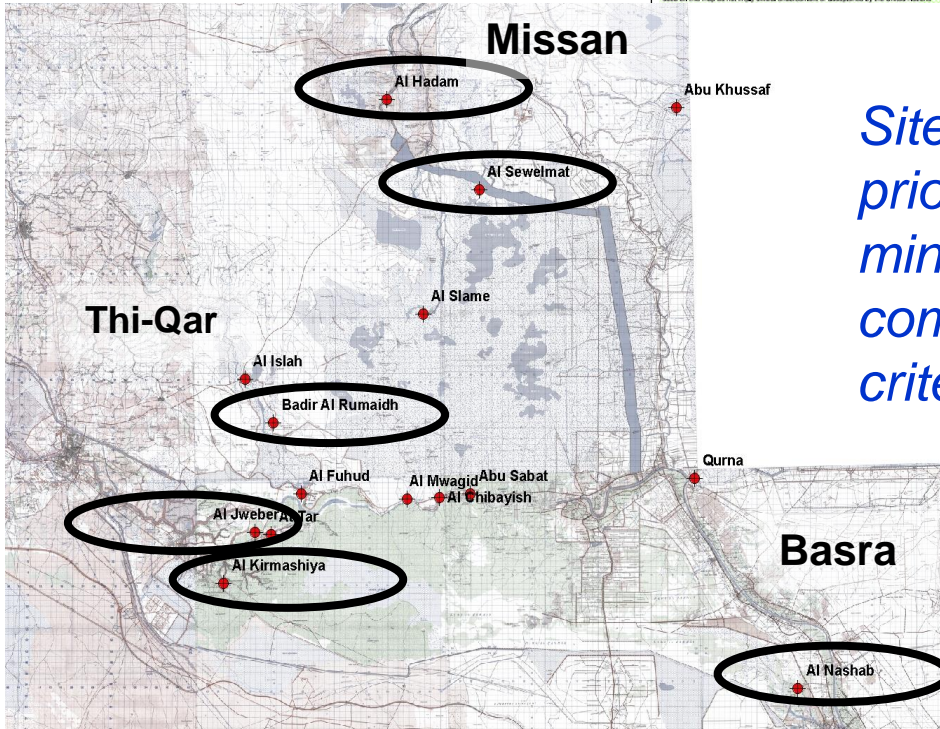
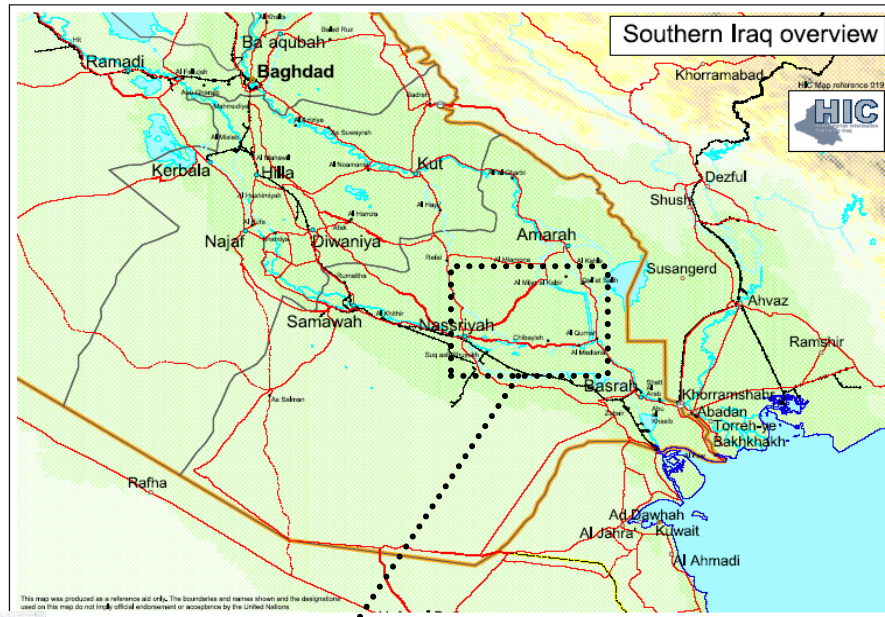
Reverse Osmosis

Others:

Bucket Treatment
Water Reuse
etc.

*Suitable ESTs depend on local conditions and needs
➔ will be decided based on EST assessment*

Highlights: Candidate EST Pilot Sites Selected



Site selection based on priorities identified by Iraqi ministries and local community group, technical criteria, and consensus

Highlights: Marshland Information Network

Challenges:

- ❖ Limited data and information sharing
- ❖ Unreliable connections

What we have done:

- ❖ Set up user friendly Marshland Information Network (MIN)
 - 10 websites developed: ministries, governorates, Marsh Arab Forum, Iraq Foundation, etc.
 - 5 servers in Iraq
- ❖ Started reflooding reports
 - to be available on MIN
- ❖ www.estis.net/communities/min_arabic/

MIN Community Site

Eden Again Site



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Capacity Building: Training Courses

❖ Completed by the end of May 2005:

1. on Water Quality Management (Shiga, Dec. 2004)
2. on Sustainable Sanitation (Osaka, Dec. 2004)
3. on Phytotechnology for Wetland Management (Cairo, Dec. 2004)
4. on Wetland Remote Sensing (Amman, Feb. 2005)
5. on Marshland Information Network = MIN (Amman, Mar. 2005)
6. on IWRM Policy and Integration (Amman, Apr. 2005)
7. on ESTs for Drinking Water Provision (Osaka, May 2005)

❖ 194 participants in total:

Male 146 (75%) and Female 48 (25%)

❖ Participants belong to:

Iraq Ministry of Environment, Ministry of Water Resources, Ministry of Municipalities and Public Work, Governorate offices, Academia, Local organizations, etc.



Visit to community sanitation plant



Information network training



Field data collection training

Capacity Building: Training Courses

❖ Schedule of Training Courses (June-July 2005):

- Community Level Initiatives (Alexandria)
- Wetland Management (Cairo)
- EST Assessment Methodology and Implementation (Amman)
- High-Level Study Tour (Japan)

❖ Secondary Training in Iraq:

Currently under negotiation for implementation of the secondary training at the Training Centre of the Ministry of Municipalities and Public Work in Iraq

❖ Training Kit/Materials:

Preparation of Training Manual for each Training Course as well as Train-the-Trainers Manual



Phytotechnology Wetland Management Training Course



Sustainable Sanitation Training Course

Challenge for Future

- ❖ Call for on-going project implementation:
 - Received a request for continuous support of secondary project implementation from Iraq
 - Important recognition of necessity for long-term marshland management
 - UNEP's role as catalyst among UN organisations and concerned countries

Highlights: Towards Coordinated Response

Donor coordination mechanism established

- ❖ Mechanism reflects thematic mandates of Iraqi institutions
 - Endorsed by Iraqi partners and donors
- ❖ UNEP nominated as facilitator for mechanism
 - Financial support from Italy, UK, activity support from Canada

Example of coordination

- ❖ Water quality monitoring: field assistance to be provided by Iraq Foundation, coordination in monitoring envisioned
- ❖ Pilot implementation: coordination of sites with Italian project to avoid overlap, dialogue with UN agencies

Moving towards coordinated management
plan/strategy development, in partnership

Project website & MIN

Project website:

- ❖ in Japanese: <http://marshlands-jp.unep.or.jp>
- ❖ in English: <http://marshlands.unep.or.jp>
- ❖ in Arabic: <http://marshlands.unep.or.jp/>
to click the logo in Arabic

Marshland Information Network (MIN):

- ❖ in English: www.estis.net/communities/MIN_Eng/
- ❖ in Arabic: www.estis.net/communities/min_arabic/



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Thank you very much

For further information:
www.unep.or.jp/marshlands



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