11.479: Water & Sanitation Planning in Developing Countries
February 11, 2005

Logistical matters:

- First policy memo assignment

Policy memo assignment

- Purpose: Provide an opportunity to apply learning to a ‘real world’ case in the form of planning recommendations
- Structure: 5-page (max.) policy memo
- Resources: All materials available on the MIT server
- Due date: Session 9 before class

Policy memo assignment, cont'd.

- Case site: Small town in Kenya
- Existing W&S services: water fetching from springs, purchasing from vendors; private and public latrines, open defecation
- No available grants from governments or external agencies to improve services; all financing must come from community or from loans
- See photos of communities like this one on the MIT server

Class objectives:

- Finish up last week's discussion about private-sector participation in W&S
- Discuss supply *versus* demand-oriented W&S planning
- Review approaches for demand assessment
- Consider how demand-responsive planning intersects with other objectives

Privatization: A continuum, not an 'either/or' choice

Type of PSP arrangement	*Asset ownership*	*Responsibility for capital investment*	*Commercial risk*
Service or management contract	Public	Public	Public
Lease	Public	Public	Public& Private
Concession	Public	Private	Private
BOT & variations	Public& Private	Private	Private
Divestiture	Private	Private	Private
Independent service providers	Private & Public	Private	Private

Small-scale independent providers: The 'other' private sector

Where is private-sector participation (PSP) happening in developing countries? Why?

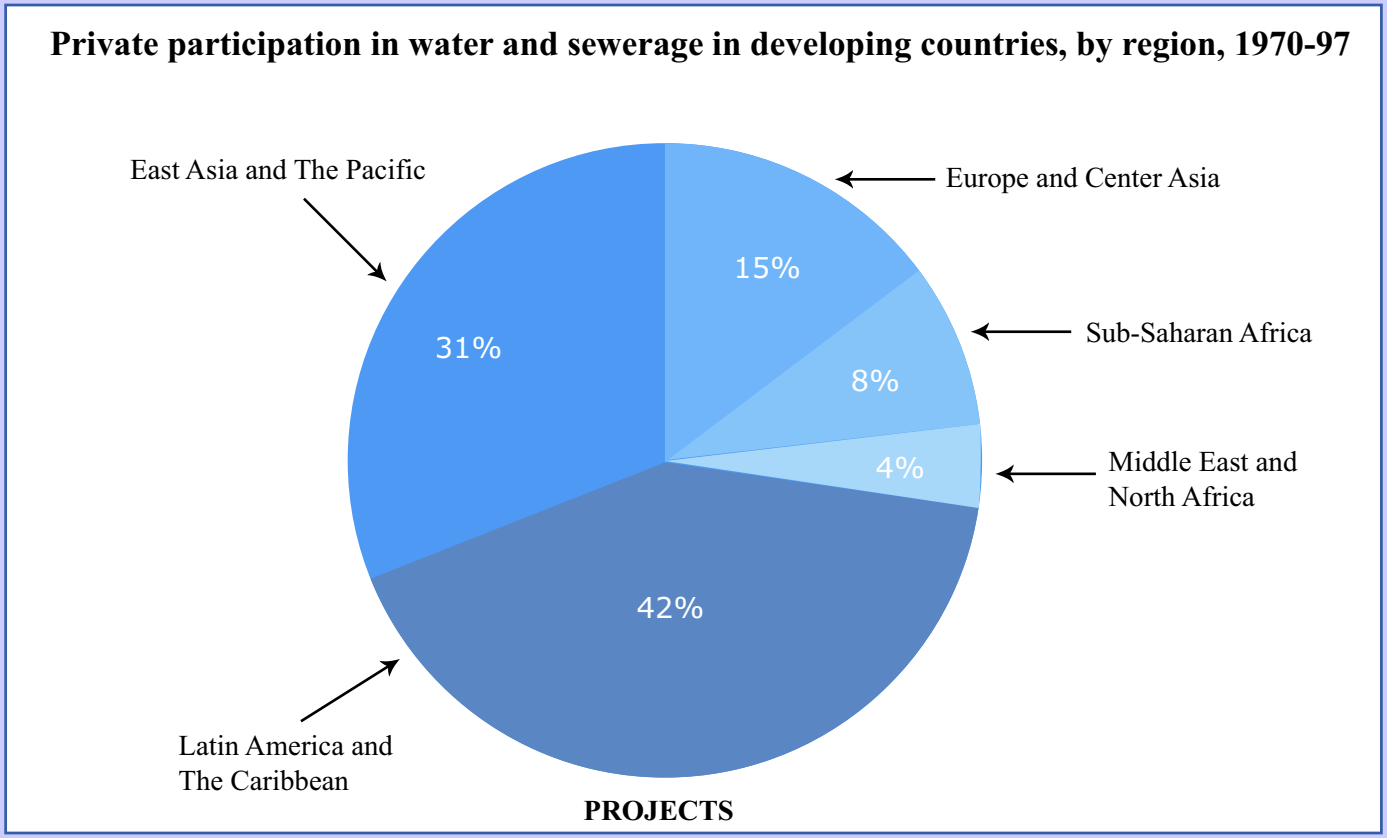


Figure by MIT OCW.

Projects *versus* investment

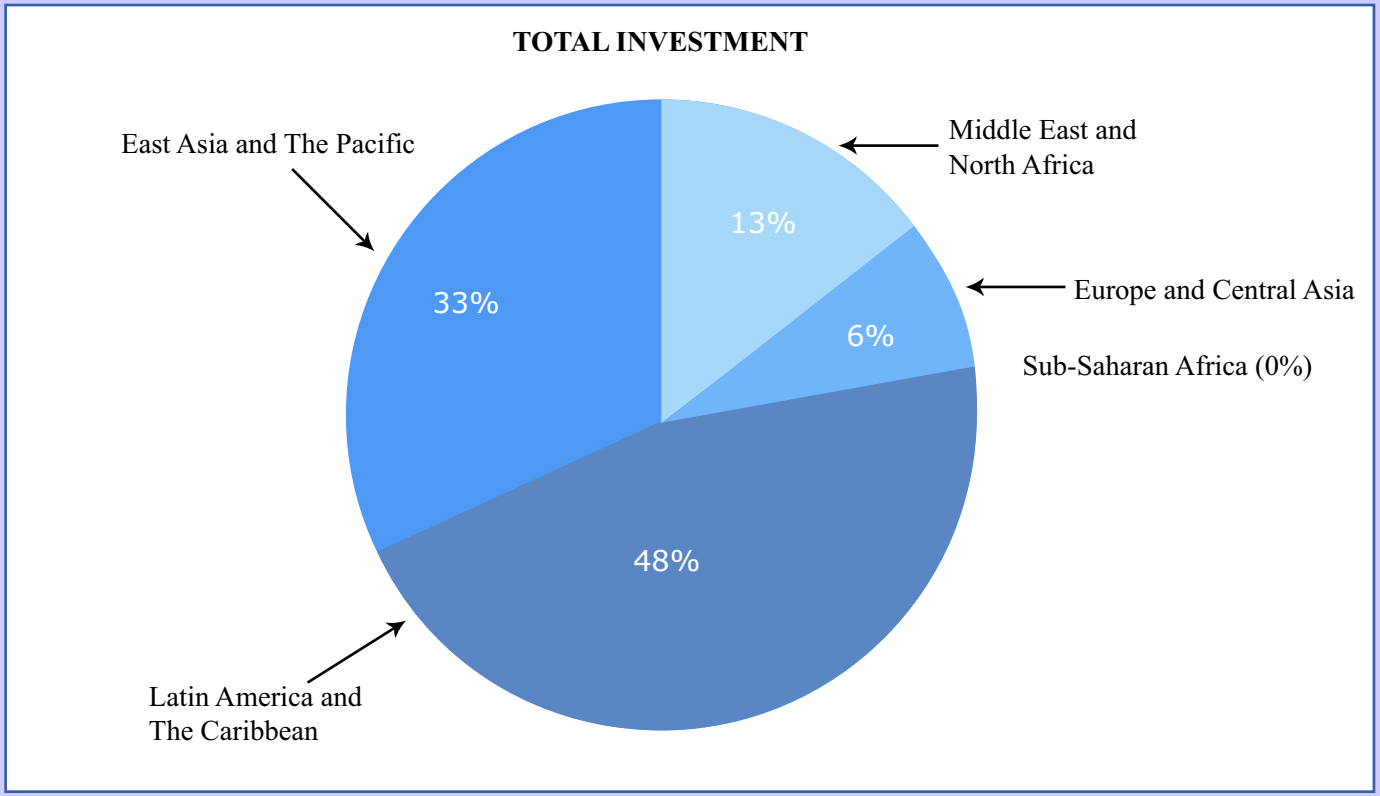


Figure by MIT OCW.

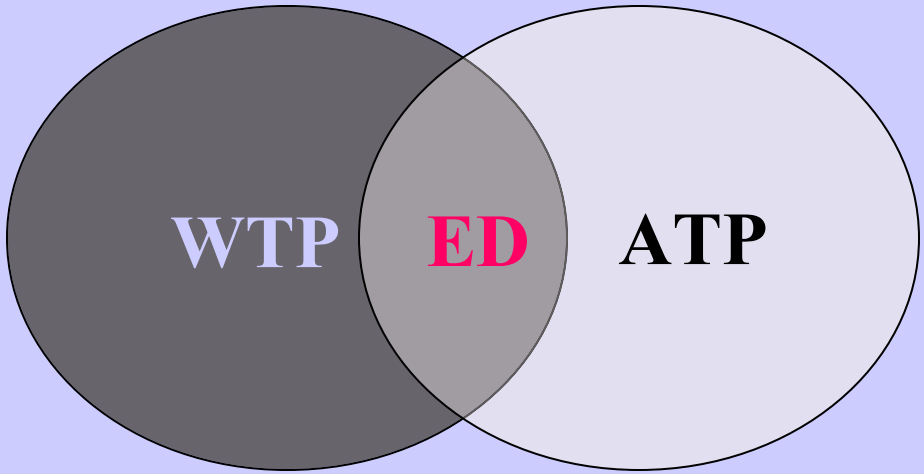
Why might we want to increase private-sector participation in W&S service delivery?

- Access to capital markets
- Technical know-how/capacity
- Attention to efficient use of funds
- More accountability / responsiveness to households (?)
- Get out of the ‘low-level equilibrium’ (Spiller & Savedeoff)

What's the evidence on whether these objectives have been met with PSP?

Location	*Year & form of PSP initiated*	*Indicator*	*Values*
Buenos Aires, Argentina	1993 Concession	Unaccounted-for water*	1992: 44% 1998: 34%
		Employees per 1000 connections	1992: 6.4 1995: 3.3 1998: 1.7
Santiago, Chile	1989 Concession & service contracts	Unaccounted-for water	1990: 28% 1994: 22%
		Employees per 1000 connections	1993: 2.1 1994: 1.9
Manila, Philippines	1997 Concession	Unaccounted-for water	1997: 58% 2001: 52%
		Employees per 1000 connections	1997: 8.5 2001: 4.1

Supply *versus* demand-oriented planning: What are the essential elements of each approach?



Supply *versus* demand-oriented planning

	Supply	Demand
How are priorities among and within communities set?		
Who decides on menu of technological options?		
How are service prices set?		
Who designs the O&M regime?		
What are the strengths of this approach?		
What are the weaknesses of this approach?		

Managing distributional implications of demand-responsive planning

Republic of South Africa's Free Basic Water Policy

"The basic policy of the Government is that services should be self-financing at a local and regional level. The only exception is that, where poor communities are not able to afford basic services, Government may subsidize the cost of construction of basic minimum services but not the operating, maintenance, or replacement costs." (DWAF, 1994)

"Procedures for the limitation or disconnection of water services must - …(c) not result in a person being denied access to basic water services for non-payment, where that person proves, to the satisfaction of the relevant water services authority, that he or she is unable to pay for basic services". (DWAF, 1997)

Other challenges with DRA

- "Undesirable" preferences: MacRae and Whittington in Haiti
- Heterogeneous preferences
- Low demand for sanitation: Whittington *et al.* in Indonesia
- Relationship between effective demand for initial improvements and demand, capacity for ongoing O&M?

Origins of demand-oriented planning

Principle No. 4, Dublin Statement

"Water has an economic value in all its competing uses and should be recognized as an economic good. Within this principle, it is vital to recognize first the basic right of all human beings to have access to clean water and sanitation at an affordable price. Past failure to recognize the economic value of water has led to wasteful and environmentally damaging uses of the resource. Managing water as an economic good is an important way of achieving efficient and equitable use, and of encouraging conservation and protection of water resources."

Origins of demand-oriented planning, cont'd.

- Fiscal crunch / debt crisis
- Donors / Neoliberal policies / Structural adjustment / The 'market model'
- Decentralization
- Poor performance in the sector

The origins of demand-oriented planning

Table 2: Outcome, Sustainability, and Institutional Development (ID) impact by sector, network, lending type/source, region and WDI income group for exit fiscal years 1990–96, 1997, and 1998 (by real disbursements, FY96US$)

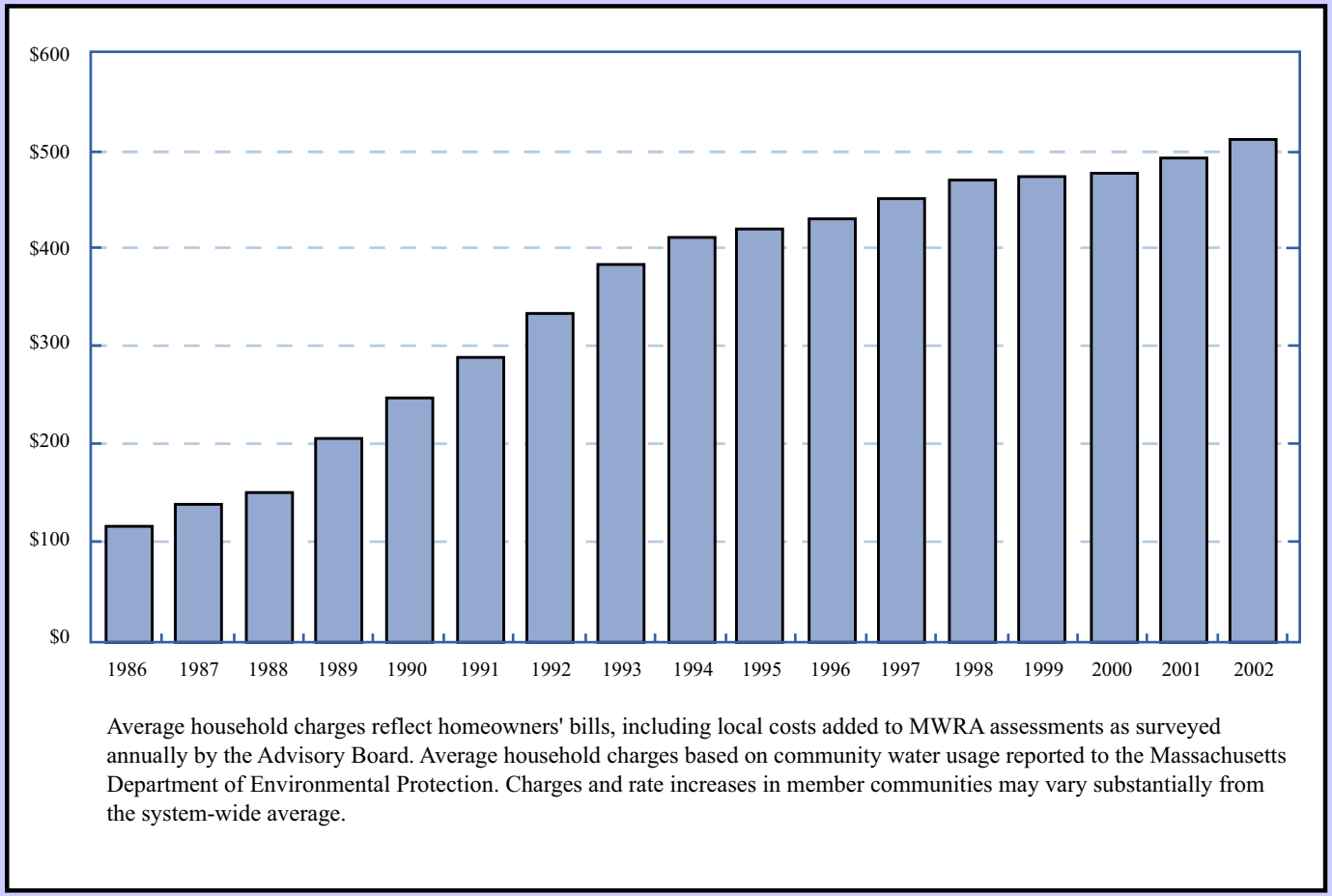
	Exit FY 1990-96				*Exit FY1997*				*Exit FY1998*			
Sector	*Disburse. $millions*	*Outcome % sat.*	*Sust. % likely*	*ID impact % sub.*	*Disburse. $millions*	*Outcome % sat.*	*Sust. % likely*	*ID impact % sub.*	*Disburse. $millions*	*Outcome % sat.*	*Sust. % likely*	*ID impact % sub.*
Agriculture	26,669	74	47	37	3,096	77	66	42	1,056	87	71	77
Education	5,993	80	61	46	1,438	85	71	53	362	95	20	25
Electric Power & Other Energy	19,350	66	67	35	1,528	87	76	40	572	90	59	48
Environment	75	100	29	0	232	78	76	40	34	100	100	0
Finance	9,767	60	53	38	2,336	50	45	33	847	85	74	68
Industry	11,890	64	55	29	1,338	75	75	81	407	0	0	0
Mining	1,273	69	80	41	106	79	79	100	270	97	97	100
Multisector	21,903	86	65	44	1,488	90	57	25	760	99	34	0
Oil & Gas	3,683	83	89	42	246	99	99	38	347	100	96	4
Population, Health & Nutrition	1,625	79	65	36	800	94	71	22	741	80	70	16
Public Sector Management	3,974	77	58	53	505	89	51	10	273	100	29	83
Social Sector	674	99	89	18	435	100	6	83	181	67	0	0
Telecommunications	1,306	78	79	44	382	90	100	88	91	100	100	100
Transportation	16,198	83	59	32	2,047	84	44	60	675	100	58	60
Urban Development	6,857	75	50	26	670	76	58	16	544	100	62	7
Water Supply & Sanitation	4,574	55	29	26	1,187	65	17	0	564	59	21	24

How do we assess demand for improved W&S services?

- Observed behavior: What are households spending on alternative services?
- Heuristics: Assumptions based on community type, location, *etc. (*the 'five percent rule')
- Key informants
- Benefit transfer: Use information about demand from one community to estimate demand for another community
- Primary data collection: Group meetings, other group data collection activities
- Primary data collection: Willingness to pay surveys

How does the 5% rule fare in Massachusetts?

Average household bills 1986 -2002, MWRA communities



Average household charges reflect homeowners' bills, including local costs added to MWRA assessments as surveyed annually by the Advisory Board. Average household charges based on community water usage reported to the Massachusetts Department of Environmental Protection. Charges and rate increases in member communities may vary substantially from the system-wide average.

Figure by MIT OCW.

What % of annual household income does this represent?

Willingness-to-pay surveys ('contingent valuation')

- Can help elicit demand information for goods or services not currently provided
- Easy to do a bad job; can be costly to do a good job

Development of CVM in the US linked to Exxon *Valdez* oil spill (1989)

- 1991 settlement between Alaska, US gov't. and Exxon ~US$3billion
- CV study (1992) finds US$2.8 billion in loss of 'passive use' value
- Much more information on this case, as well as on CVM debates (ask JD)

Components of a high-quality CV study

- Description of good or service offered
- Explanation of costs and benefits
- Details on how much others pay, when good/service is provided, by whom, *etc.*
- Reminder about budget constraint
- Willingness-to-pay question
- Questions on socioeconomic and demographic characteristics of household (why?)

Assessing validity in a CV study

1. Check the demand curve

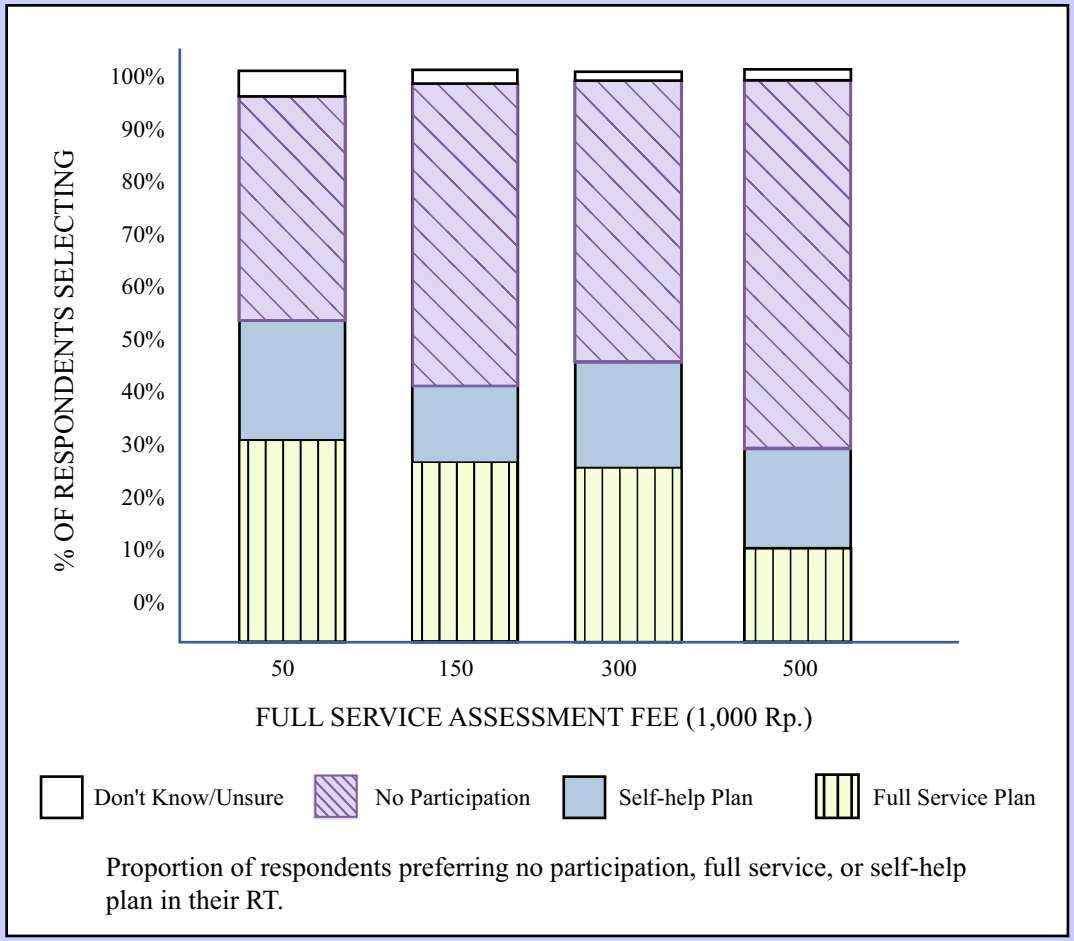


Figure by MIT OCW.

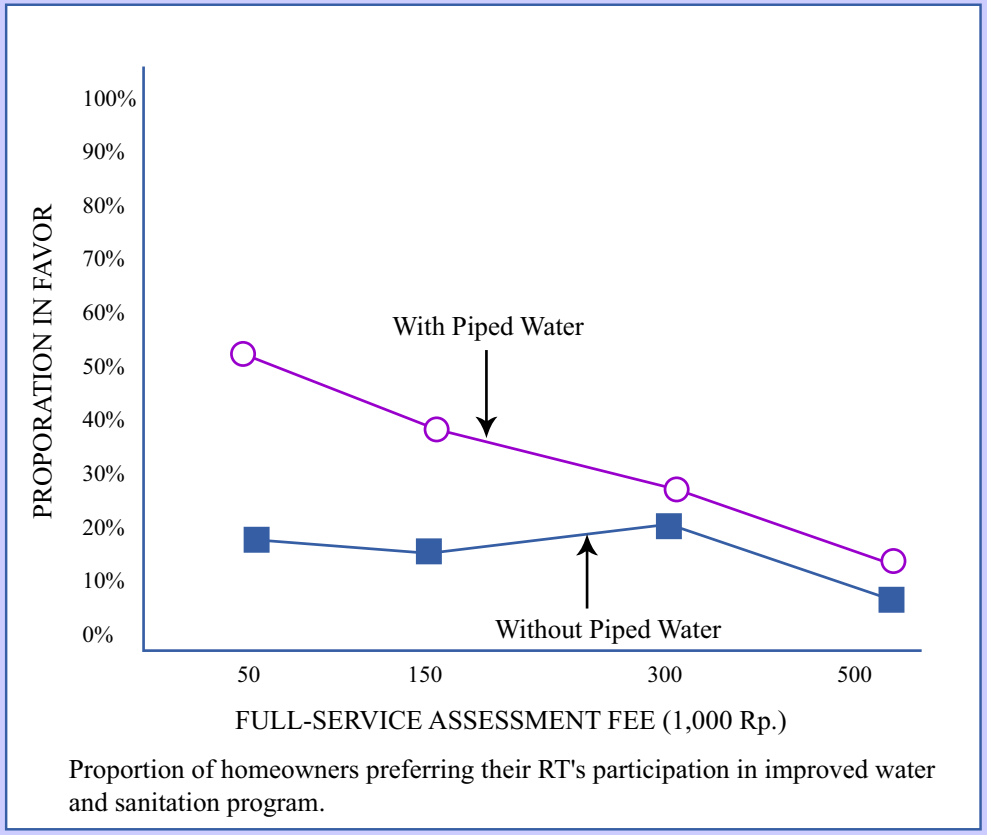
Assessing validity in a CV study, cont'd.

2. Compare stated preference data with available revealed preference data.

- Semarang, Indonesia: 11% of households obtain 'all or almost all' water from vendors, at a cost of approximately US$20 per month
- Morocco: WTP bids for improved water were high—but only about twice as high as actual expenditures on cigarettes

Assessing validity in a CV study, cont'd.

2. Check that demand 'tracks' with other variables (*e.g.*, income, current service level) as predicted



Proportion of homeowners preferring their RT's participation in improved water and sanitation program.

Figure by MIT OCW.

Summing up

Demand-responsive planning can be useful when it:

- Forces us to think about the contribution of financial sustainability to overall sustainability of W&S infrastructure investments
- Gives us a reality check on assumptions about community needs and preferences
- Helps us generate more and better alternatives, and/or reveals why our alternative may not be attractive
- Lets us know whether capital grants, or merely financing, is needed for users to cover most/all of the costs of improved services

However, DRA raises concerns with respect to fairness and inclusiveness, which is one reason that CVM has not had greater influence on W&S planning and policy.