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Regulation, Organization and Incentives: the political economy of potable water services in Honduras

INDEX

INDEX OF TABLES AND CHARTS

Regulation, Organization and Incentives: the political economy of potable water services in Honduras[1]

Ian Walker, Max Velásquez, Fidel Ordoñez and Florencia Rodríguez

INTRODUCTION

This case study of urban water and sanitation in Honduras focuses on the perplexing phenomenon of low level equilibrium (LLE). It first seeks to characterize LLE in terms of sector performance and to show how it is propitiated by flawed arrangements for sectoral governance, organization of service delivery and regulation. It then turns to the question: why is it so difficult to escape from LLE? To this end, it analyses the failure of recent reform efforts, using political economy techniques.

Section I presents performance indicators for the Servicio Nacional de Agua y Alcantarillado (SANAA) and for municipal providers, and argues that poor performance of each is rooted in their exposure to political capture and in the lack of adequate regulation,rather than in their levels of centralization or decentralization. In support of this thesis, it presents econometric evidence on the credibility of different sorts of service provider, using willingness to pay data from a recent nationwide survey, which suggests that public providers lack credibility and are more exposed to rent seeking behavior than private providers. It then makes a financial analysis of SANAA, which shows that it could quickly become self financing if it reached reasonable goals for cost effectiveness and tariff effort, and shows that the welfare gains from doing this would be very large indeed. The section concludes that the case for reform is overwhelming, but that the political task of organizing reform is a considerable one.

Section II focuses on the political economy of reform. It traces the history of the failed Water and Sanitation Sector Structural Adjustment Credit, which was supported by the World Bank and the IADB during 1994-96. A stakeholder analysis shows how the proponents of reform failed to mobilize the potential sources of support and the government itself was divided, while opponents exploited weaknesses in the proposal to mobilize opposition. Two weaknesses were particularly damaging. In the first place, the reform proposal made a central principle of municipalization, but failed to address the poor performance and low credibility of existing municipal systems. A review is made of recent efforts at municipalization in Honduras, concluding that the strategy is feasible, but is not a panacea for all the sector's ills. There is also a need to develop a credible model of municipal water system operation, independent from political interference. Secondly, the reform proposal did not adequately address the issue of a regulatory guarantee for users. The paper concludes by showing how these lessons have been incorporated into the reform strategy, strengthening the prospects for success in the coming years.

[1] The authors are grateful to Bill Savedoff of IADB and Pablo Spiller of the University of California at Berkley for their comments on earlier drafts of this paper.

I WATER AND SANITATION IN HONDURAS: A CASE STUDY IN LOW LEVEL EQUILIBRIUM

1. The performance of the sector

This section reviews the performance of SANAA and of municipal operators of water and sanitation systems. It shows that the sector as a whole is in a parlous state, characterized by stagnation of coverage, poor service quality and low cost recovery.

a) Service coverage

The performance of the water and sanitation sector over the last 20 years has not been good. Coverage of piped potable water services in the urban sector has stagnated since 1973, at just over 80% (table 1); the water networks have expanded only fast enough to keep abreast of population growth. In contrast, in the rural areas (communities under 500 inhabitants), coverage of piped water has grown sharply, from 21% in 1973 to 40% in 1993, but is still very low. Including non-piped sources, such as wells, some 53% of rural dwellers were estimated to have access to potable water in 1993.

Within these totals, SANAA is directly responsible for only 23% of all connections, covering just 14% of the population of Honduras (table 2). However, additionally, SANAA was involved in the construction of rural systems supplying water to an estimated 440,000 people, now administered by *Juntas de Agua* (Water Commissions).

Only 29% of the urban population is covered by SANAA (table 2). Municipalities are responsible for 65% of urban connections, which supply around 54% of the urban population**.** The following sections review the performance of the metropolitan and non-metropolitan systems under SANAA and municipal management.

The organization of the water and sanitation sector in Honduras

The Servicio Autónomo Nacional de Agua y Alcantarillado (SANAA) was formed in 1961 as an autonomous state enterprise, to serve as rector of the water and sanitation sector, responsible for service delivery norms and charged with operating services in all urban communities with populations above 500.

The law which created SANAA specified that it would gradually assume control of all the existing municipal water and sewerage systems in Honduras. However, the law stopped short of creating a legal monopoly, and at present in Honduran towns with populations of 2,000 or more, there are 74 municipal water systems (including that of the second city, San Pedro Sula), compared with 23 SANAA systems.

Municipal utilities supply around 65% of urban water connections, covering some 54% of the urban population, while SANAA supplies 35% of connections, covering 29% of the urban population; the only sewerage system run by SANAA is that of Tegucigalpa.

In 1990, municipal development legislation established water and sanitation as municipal competencies; however, the law which created SANAA was neither repealed nor reformed, so the existing statutes are contradictory.

Table 1

Honduras: Water and sanitation coverage

	Water					Sanitation			
		Piped		Total		Sewerage		Total inc. latrines	
	1973	1988	1993	1988	1993	1988	1993	1988	1993
					Millions of people covered				
Urban	0.76	1.40	2.05	1.51	2.22	0.93	1.24	1.54	2.25
Rural	0.41	0.97	1.09	1.12	1.45	0.20	0.14	0.95	1.23
National	1.17	2.38	3.12	2.64	3.64	1.15	1.30	2.51	3.43
					Percentage of population covered				
Urban	81%	80%	83%	86%	90%	53%	50%	88%	91%
Rural	21%	39%	40%	45%	53%	8%	5%	38%	45%
National	43%	56%	60%	62%	70%	27%	25%	59%	66%

Source: OPS, OMS (1993) and our calculations

Table 2

Population with coverage by type of provider, 1993

	Persons, mn	% of population	% of connections
Urban	2.05	83%	100%
SANAA	0.71	29%	35%
Municipal	1.34	54%	65%
Rural	1.09	40%	100%
SANAA	0.02	1%	2%
Other/1	1.08	39%	98%
National	3.12	60%	100%
SANAA	0.73	14%	23%
Municipal	1.34	26%	43%
Other/1	1.05	20%	34%

Source: calculated from SANAA and OPS data

Note: 1/ Many of the rural systems were constructed by SANAA but then handed over to Juntas de Agua.

SANAA estimates that 440,000 persons living in rural areas are covered by such aqueducts.

b) The metropolitan systems

Honduras has two major cities: the capital, Tegucigalpa, in the center of the country, with a population of 800,000; and the industrial center of San Pedro Sula on the north coast, with a population of just under 500,000. The water and sewerage system of the former is run by SANAA; the latter, by the municipality.

The Tegucigalpa system dominates SANAA's operations, accounting for over half of the company's 140,000 connections. Water coverage in Tegucigalpa, at 85%, is scarcely better than the national urban average of 83%, and much of that coverage is due to private systems which have grown up to fill the vacuum left by SANAA. According to SANAA's commercial cadaster there are 72,000 domestic

connections in the city; this represents less than half the city's households. The cadaster is known to be very inadequate, but even supposing the existence of a further 38,000 illegal or unregistered connections to the SANAA system, there are still 30% of Tegucigalpa's dwellings uncovered by the SANAA system (table 3).

Table 3
Tegucigalpa: households with domestic connections by type of provider, 1996

	No. '000	%
SANAA - cadaster	72.0	46%
SANAA - illegal	38.0	24%
Private networks	24.5	16%
Without domestic connection	22.5	14%
Total	157.0	100%

Sources:: Based on data from DGEC, for the total number of dwellings and for the % without a connection; from SANAA for the number of formal domestic users in the cadaster; SANAA for the number of marginal barrio users in private systems which receive water from SANAA; and Walker and Ordoñez (1995) for marginal barrio users of private systems with independent supply. The estimate for illegal connections to the SANAA system is then calculated as a residual. SANAA's own estimate of illegal connections is much lower, at 15,000.

This reflects SANAA's failure to expand services to the marginal barrios, in the main located on high ground, to which it is relatively costly to deliver water supplies, due to the need for pumping stations. The unresolved tenure status of many of these settlements also creates problems for their formal incorporation to the public service.[2] About a third of these dwellings have piped water from private distribution systems administered by barrio committees. Some have their own wells; others receive water from SANAA's network, either illicitly or on the basis of the block tariff[3].

Many bilateral lenders and NGOs support the development of marginal barrio water systems; most notably, UNICEF has a project with SANAA to finance the construction of distribution systems in such barrios. However, the marginal barrio systems normally offer an inferior service. Those with their own wells tend to have poor water quality, with high salinity. Those whose water is supplied "in block" by SANAA often face an infrequent service and low pressure. Meanwhile, some 22,500 dwellings - almost 15% of the city's total - are altogether without piped water.

SANAA's failure to expand coverage is rooted in a poor cost performance and a weak tariff effort. The metropolitan system of Tegucigalpa has an estimated 13.6 staff per 1,000 connections - at least three times

[2] In Central America, contractual rights to public services are attributions of individuals, not of their property, and are in principle transferable between properties, but not between persons. Public utility companies will not normally extend service contracts to individuals whose tenure status is contested as this may expose them to legal action on the part of the legal owner of the property. This contrasts with many countries in South America, where the service is attributable to the property and is automatically extended to whomsoever occupies the property for the time being, so that tenure is not an issue in extending service cover to marginal areas.

[3] The block tariff is a wholesale rate for the sale of water to independent distribution systems, which is set well below the normal commercial tariff, in order to reflect only production costs and not distributional and commercial costs.

the necessary level.[4] These high staffing levels are attributable above all to a rigid collective agreement which prevents multi-tasking.[5] Detailed data for SANAA's cost structure (tables 4 and 5) show that the main problems are rooted in labor costs in Tegucigalpa and in the central administration. Labor costs per connection in Tegucigalpa in 1993 stood at L.140 per year, almost double the L.77 incurred in the rest of the country (table 4). Additionally, there is a very large labor cost in the central administration, representing 17% of SANAA's total costs (table 5).

Table 4

Annual costs per connection, 1993 /1

	Tegucigalpa	Other systems	Total/2	
	Lps.	Lps.	Lps.	US$ /3
Labor costs	140	77	181	26.6
Energy	61	87	74	10.9
Chemicals	87	6	49	7.3
Depreciation and provisions	0	0	74	10.8
Other operating costs	17	12	35	5.2
Total	305	181	414	60.8

Notes: 1/ Excludes debt interest, which is absorbed by central government.

2/ Including the costs of central administration

3/ Exchange rate 6.8

Source: Aquagest, 1995 and our calculations

Table 5

SANAA's cost structure, 1993 /1

	Central Admin.	Tegucigalpa	Other systems	Total
Labor costs	17%	18%	9%	44%
Energy	0%	8%	10%	18%
Chemicals	0%	11%	1%	12%
Depreciation and provisions	18%	0%	0%	18%
Other operating costs	5%	2%	1%	8%
Total	40%	39%	20%	100%

Note: 1/ Excludes debt interest, which is absorbed by central government.

Source: Our calculations from data in Aquagest, 1995

[4] This is our estimate, including a share of SANAA's central administrative employment in proportion to the number of connections in the city. Estimates for SANAA's staffing levels vary considerably, in part due to the practice of including many employees on the payrolls of investment projects, which are not consolidated into the company's accounts. Our estimate for Tegucigalpa is derived from data on labor costs, and is probably conservative. The overall number of SANAA employees per thousand connections was estimated in January 1995 at 14 .7, which would imply a higher ratio for Tegucigalpa.

[5] During 1997 SANAA has made some headway in negotiations with the union to increase flexibility and reduce staffing levels. However, few redundancies have been implemented. In January 1997 SANAA had total staff of 1,809, which is 13 per 1,000 connections, compared with 1,936 a year earlier (13.8).

The performance of SANAA's Tegucigalpa system contrasts poorly in many respects with that of the División Municipal de Aguas (DIMA) in San Pedro Sula. Formed in 1976, DIMA is part of the municipality but is administratively independent. In spite of the rapid growth of San Pedro Sula (seven per cent annually in recent years) it has achieved a coverage of 84%. In 1994, DIMA reported 6.5 employees per 1,000 connections (table 6).

Table 6

Performance indicators for SANAA's metropolitan system and DIMA, 1994

	SANAA-Tegucigalpa	DIMA	
Legal individual connections	76,050	59,794	
Domestic	*71,713*	*54,064*	/1
Other	*4,337*	*5,730*	
Coverage of legal domestic connections	46%	84%	/2
% of all connections with meters	64%	43%	
Unaccounted for water	50%	48%	
Employees per 1,000 connections	13.6	6.5	/3
Total billings, L. mn. per year	38.6	46.3	
Billings per connection, L. per month	42	64	
Income from billings, L. mn per year	26	31.4	
Collection rate	67%	68%	
Income per connection, L. per month	28	44	

Notes

1/ The figure for DIMA includes projects and special connections

2/ % of households in the city legally connected to the system- our estimate

3/ The figure for Tegucigalpa is our estimate, including a share of central administrative posts in proportion to connections.

The SANAA system in Tegucigalpa also shows a much weaker income performance, compared with DIMA. In 1994, average billings per connection stood at L.42 per month in Tegucigalpa and L.64 in San Pedro Sula, and income per connection was, respectively, L.28 and L.44. In this context, it is striking to note that in 1994, DIMA's tariff income (L.31.5 mn) was scarcely below the total tariff income of SANAA in the whole country (L.35.8 mn).

However, DIMA's operation is not superior to SANAA's Tegucigalpa system in all aspects of performance. DIMA's metering coverage in 1994 was 43% compared with 64% for Tegucigalpa; its level of unaccounted for water stood at 48%, scarcely better than Teguciglapa's 50%; and the collection rates of the two systems are very similar, with income standing at just under 70% of billings (table 6). And, most importantly, both have exhibited serious problems with political interference in their management of the tariff. We return to this point in section I.2 below.

c) The non metropolitan systems

This section presents an analysis of the performance of non-metropolitan SANAA and municipal systems, undertaken for the present study.[6] The sample of systems studied is described in table 7. They represent a range of municipal and SANAA-managed systems with broadly matching characteristics in relation to size, type of water source, poverty levels in the corresponding community and geographical location. The aim of constructing these two groups was to see if there are any systematic differences in performance which might be attributed to the system's administration, rather than to the other factors mentioned.

Table 7
Characteristics of the non metropolitan systems studied

	Type of admon.	Urban popln	Type of source/1	Poverty index	Zone
Choluteca - Sis. Municipal	Mun	70,585	P	34	South
Choloma	Mun	70,200	P	33	North
Sta.Rosa de Copán	Mun	24,356	P	44	West
Olanchito	Mun	24,000	G	28	North
Tocoa	Mun	18,916	G	26	Atl.coast
El Paraíso	Mun	16,613	G	34	Center-east
Nacaome	Mun	15,304	P	53	South
Ocotepeque	Mun	11,166	G	25	West
Azacualpa	Mun	5,100	G	34	West
Choluteca - Sis. SANAA	SANAA	70,585	M	34	South
Comayagua	SANAA	52,355	G	32	Center-west
Danlí	SANAA	38,088	M	40	Center-east
Juticalpa	SANAA	28,700	P	39	Center-east
La Entrada	SANAA	18,412	M	33	West
Intibucá	SANAA	10,088	G	53	Center-west
Sn.Marcos de Colón	SANAA	7,966	M	43	South

Note: 1/ G = gravity, P = pumped, M = mixed

[6] This section is based on a survey carried out in mid 1995 by FUNDEMUN for the World Bank, and on data on municipal performance held by FUNDEMUN and AHMON. We would like to thank FUNDEMUN and the World Bank for allowing us to use these data sources. However, responsibility for the analysis of the data and for the conclusions presented here, is ours alone.

Table 8
Indicators of physical efficiency in non-metropolitan municipal and SANAA systems

	No of clients	Water cover	Sewerage cover	Av. Hours service	% intermit-tent service	Staff / 1,000 connections
Municipal systems						
Azacualpa	850	100%	0%	24	0%	2
Choloma	4,771	41%	25%	14	60%	5
Choluteca - Municipal	1,100	n.a.	n.a.	n.d.	n.d.	15
El Paraíso	2,300	83%	33%	n.d	n.d.	2
Nacaome	1,113	44%	10%	11	100%	6
Olanchito	3,184	53%	54%	6	85%	2
Ocotepeque	1,846	89%	n.d.	8	70%	2
Sta.Rosa de Copán	2,254	50%	40%	6	60%	4
Tocoa	2,650	84%	8%	5	95%	4
Totals and averages /1	**20,068**	**68%**	**24%**	**11**	**67%**	**4**
SANAA systems						
Comayagua	6,402	73%	69%	17	30%	3
Choluteca - SANAA	6,709	n.a.	n.a.	n.d.	n.d.	8
Danlí	3,344	53%	54%	n.d.	90%	2
Intibucá	1,220	73%	30%	18	50%	4
Juticalpa	3,500	73%	59%	8	100%	6
La Entrada	1,968	64%	8%	3	100%	9
San Marcos de Colón	998	75%	26%	6	94%	4
Totals and averages /1	**24,141**	**68%**	**41%**	**10**	**77%**	**5**

Note: 1/ We report the weighted average for employees per 1,000 connections; the other averages are simple.

Table 8 presents a summary of indicators of physical efficiency for the two groups. While there are considerable variations within each group, it is striking that the averages are very similar. Each group has achieved a coverage of only 68% of the urban population. Service frequency averages 11 hours a day in the municipal systems and 10 in the SANAA systems; 67% of municipal users and 77% of SANAA users face an intermittent service. And most strikingly of all, both groups have very low levels of staff: four per 1,000 connections for the municipal systems and five for the SANAA systems. This serves once more to underline the point that overstaffing in SANAA is concentrated in Tegucigalpa.

The similarities between municipal and SANAA suppliers continue when we turn to the indicators of financial performance, which are presented in table 9. Operating cost per connection averaged L.252 per year in the municipal group and L.225 in the SANAA group. Labor cost per connection is L.72 in the municipal group and L.97 in the SANAA group, reflecting the latter's slightly higher staffing levels; wage levels appear to be similar between the two groups.

Table 9
Indicators of financial efficiency in non-metropolitan municipal and SANAA systems, 1994

	Operating cost per conn./1	Labor cost per conn.	Billings per conn.	Collect-ion rate /2	Income per conn.	Total profit /3	Profit per conn./3	Profit as % of expenses	Policy of service suspension?	% with meter
Municipal systems	Lps/yr.	Lps/yr.	Lps/yr.	%	Lps/yr.	Lps/yr.	Lps/yr.	%		%
Azacualpa	27	n.d.	n.d.	n.d.	23	-3,185	-4	-14%	NO	0%
Choloma	437	67	230	68%	157	-1,335,864	-280	-64%	YES	0%
Choluteca - Municipal	609	169	250	n.d.	n.d.	n.d.	n.d.	n.d.	YES	n.d.
El Paraíso	148	n.d.	n.d.	n.d.	120	-63,882	-28	-19%	YES	0%
Nacaome	301	47	121	92%	112	-211,000	-190	-63%	YES	0%
Olanchito	75	n.d.	68	89%	61	-45,550	-14	-19%	NO	0%
Ocotepeque	19	n.d.	n.d.	n.d.	58	71,266	39	203%	NO	0%
Sta.Rosa de Copán	484	46	279	47%	131	-796,429	-353	-73%	YES	0%
Tocoa	91	n.d.	189	99%	187	253,154	96	105%	NO	0%
Totals and avs. /4	**252**	**72**	**189**	**54%**	**103**	**-2,801,594**	**-140**	**-55%**		**0%**
SANAA systems										
Comayagua	96	n.d.	167	89%	149	339,696	53	55%	YES	8%
Choluteca - SANAA	272	130	138	98%	136	-916,714	-137	-50%	YES	n.d.
Danlí	205	49	125	99%	124	-272,066	-81	-40%	YES	0%
Intibucá	91	n.d.	150	79%	119	33,703	28	30%	YES	0%
Juticalpa	447	80	0	0%	0	-1,564,884	-447	-100%	n.a.	0%
La Entrada	203	123	122	87%	122	-159,597	-81	-40%	YES	1%
San Marcos de Colón	223	49	157	64%	101	-121,932	-122	-55%	YES	0%
Totals and avs. /4	**225**	**97**	**125**	**85%**	**107**	**-2,661,794**	**-110**	**-49%**		**1%**

Notes: 1/ Defined as total expenditure on water and sewerage per water system connection

2/ System income from water and sewerage as % of billings

3/ Negative sign indicates a deficit.

4/ Weighted averages for operating expenditure per connection and for operating profit. Other averages are simple.

The municipal systems studied registered a better tariff effort, billing an average of L.189 per connection, compared with L.125 for SANAA. However, this is offset by a much lower collection rate, at 55% for the municipalities, compared with 85% for SANAA. As a result, income per connection is similar between the two groups (L.103 and L.107 respectively). It is also striking that SANAA registered zero income for the Juticalpa system, which had recently received significant new investments under the IADB's Four Cities

project. As a condition of this investment, the sytem had been transferred from municipal control to SANAA ownership, but SANAA had not yet organized a commercial system.[7]

The data for operating profit show that, on average, the municipal and SANAA non-metropolitan systems are equally incapable of covering their costs. There is little here to support the hypothesis that the municipal politicians are in general less prone to under charging than their counterparts in central government. In fact, the loss per connection in the municipal systems averages L.140 per year, compared with L.110 for the SANAA systems. Losses averaged 55% of expenses in the municipal group and 49% in the SANAA systems. Nevertheless, two of the municipal systems studied, Tocoa and Ocotopeque, registered a tidy profit, confirming that the possibility also exists of over-charging to fund other projects.

2. How existing arrangements for sectoral governance and regulation contribute to poor performance

The above analysis places in doubt the thesis that centralization is the sector's main problem. Both the centralized SANAA and the decentralized municipal systems exhibit serious weaknesses in their performance. All the non-metropolitan systems studied appear to be under capitalized and weakly administered. All are in need of investment resources and technical assistance for both their physical and organizational development. These findings suggest, rather, that the sector's poor overall performance is rooted in the weakness of the existing structure of sectoral governance and regulation, which fails to comply with most of the internationally established norms.[8] The following paragraphs detail the main failings.

a) Sectoral governance and resource allocation

Sectoral strategy is formally a matter for the Ministry of Health, but is effectively delegated to SANAA, which submits investment proposals for the approval of the planning and finance ministries.[9] However, SANAA also acts as the single largest service producer, concerned to procure resources for its own projects. There is a clear conflict of interest between these functions, the more so because capital resources are supplied as grants (not loans) to SANAA.

SANAA's conflict of interest in acting as the strategic planner for the sector and simultaneously, as an operator of services, is clearly reflected in the skewed distribution of capital resources in its own favor. Although it supplies only 23% of the connections in Honduras, in the five years 1989-93, SANAA received 66% of Honduras' water sector investments (table 10). SANAA's investments were heavily concentrated in urban projects (73%), with only 27% designated for rural systems. Other agencies important in investment

[7] Data for the SANAA system as a whole for 1994 show billings per connection outside Tegucigalpa of L.134, very close to the L.125 found in our sample. Income per connection was L.148, implying a collection rate of 110%, presumably due to the charging of arrears. In 1995, the situation changed radically. SANAA billed L.234 per connection, but collected only L.86, a collection rate of 37%. It is also striking that although 46% of SANAA's connections are outside Tegucigalpa, only 22% of billings and 15% of income arose outside Tegucigalpa in 1995 (Source: SANAA).

[8] A summary of "good practice" for water sector organization can be found in Foster (1996)

[9] The finance ministry has a directorate responsible for monitoring the performance of public service providers, which publishes reports on performance, but this is not functionally important.

finance in the sector are the Ministry of Health, which finances small rural systems (17% of the total), the Honduran Social Investment Fund, FHIS, which finances both rural systems and urban marginal systems (8%) and San Pedro Sula's División Municipal de Aguas (DIMA) (9%).

SANAA's failure to expand coverage at an adequate rate is rooted rather in its inefficiency in the use of capital, than in the lack of resources; during 1989-93, the investment assigned to the sector averaged 1.2% of GDP (table 10). So long as system operators receive capital free of charge as grants from the central government, and with no other type of accountability mechanism, they cannot be expected to use it efficiently. It is hardly surprising, for example, that SANAA has no preventative maintenance program, or that it seeks to disguise a large part of its operating costs as capital expenditures.

Table 10

Honduras water and sanitation sector: distribution of investment resources by agency, 1989-93

	1989	1990	1991	1992	1993	Total	Total
				Lps.mn			
SANAA, Total	86	139	106	119	149	599	66%
of which, rural	*17*	*28*	*34*	*51*	*38*	*167*	*18%*
Ministry of Health	17	20	39	44	36	156	17%
DIMA	4	6	8	11	50	79	9%
FHIS	0	8	23	17	23	71	8%
Total, Lps.	107	173	176	190	258	905	100%
				Percentage			
Total, % of GDP	1.0	1.4	1.1	1.0	1.3	1.2	
				US$ mn			
Total, US$	38	58	44	33	38	211	
Note: Exchange rate	2.8	3.0	4.0	5.8	6.8	n.a.	

Source: BID/BIRF/OPS 1994: 19

b) The political control of system operation and the problems of rent seeking

In the second place, the operation of all systems - both SANAA and municipal - is usually subject to political interference. There is a general belief that water services are a social good which should be subsidized, and nowhere in Honduras does a water system operate with fully independent finances. The result is the capture of system rents by users through generalized under charging. However, the benefit to users is ambiguous, because the corollary is low quality provision.

The users are not necessarily the main beneficiaries of political interference in the operation of water systems. In SANAA, the workforce captures a large proportion of system rents through a union organization which has established very high staffing levels in Tegucigalpa. According to a study commissioned by the IADB, World Bank and Panamerican Health Organization, the union "has acquired such strength and predominance in the company that the nomination of technical, administrative and manual staff requires union approval, as do decisions related to operations and control" (BID/BIRF/OPS, 1994: 14). The co-administration of the union also contributes to weak commercial performance. In late 1996, SANAA's commercial director was replaced at the request of the union when he alleged that union leaders based in his department had been involved in corrupt practices linked to the assignment of new connections.

However, these problems are not limited to SANAA. As seen in the previous section, the non-metropolitan municipal systems show very similar patterns of tariff effort and service efficiency to those registered by SANAA's non metropolitan systems, and in recent years DIMA in San Pedro Sula has also experienced serious problems with political interference in the tariff decision (see box).

Econometric evidence on willingness to pay for improved water services, produced for the present study, provides a measure of the extent to which the politicized control of system operation has undermined the credibility of public sector providers, both SANAA and municipalities. After controlling for factors such as existing service cost, quality, incomes and education, willingness to pay for service improvements should be positively correlated with the supplier's credibility as a service provider. The evidence, summarized in the box below and detailed in Annex 1, suggests that there is little difference between SANAA and the municipalities. However, in contrast, willingness to pay for service improvements is much higher among clients of privately administered systems.

DIMA: a case study in political interference in the tariff decision

From 1984 on, to fund the implementation of a water and sanitation master plan, San Pedro Sula took on debt from the World Bank and the Commonwealth Development Corporation, with central government guarantees. It also has outstanding loans from the IADB and USAID. In contrast to the SANAA, DIMA is required by the Government to cover the debt service from its operating revenues. However, there were long delays in the execution of the projects, due in part to the political problems of the 1980s, and in part to disputes with principal contractors. As a result, the grace periods on the loans ran out before the works were completed and could begin to generate income. In addition, the lempira cost of the dollar-denominated loan service was inflated by currency depreciation from 1990 onwards, while increased reliance on subterranean sources of water, coupled with increased electricity tariffs, led to a tenfold increase in DIMA's electricity bill.

DIMA needed to double its tariffs to get over the problem - but the municipality refused to approve such a sharp increase. As a result, from 1993 onwards, DIMA faced a cash crunch and the central Government had to cover part of the debt service due to the World Bank, to the tune of US$7 mn between 1993 and 1995. Although tariffs were finally adjusted in 1995, the agreed rise was much less than the necessary 100%, and DIMA hoped to close the gap by shifting away from its heavy dependence on subterranean sources. These problems have tarnished the image of DIMA as a model for the municipal administration of water systems and have generated pressure for increased private sector participation in order to de-politicize tariff setting and provide access to sources of capital.

c) The regulatory system

The regulation of the sector is badly conceived and weakly implemented. It fails in what should be its central goal of defending the right of existing and potential users to receive a good quality service at a reasonable cost. SANAA's users have no effectively enforceable rights, and municipal services are completely unregulated.

The principal regulatory agency is the Comisión Nacional Supervisora de Servicios Públicos (CNSSP), which is responsible for economic regulation. In addition, the Ministries of Environment and Natural Resources and of Public Health have regulatory responsibilities regarding the use and protection of water sources, sanitary disposal of waste water, and norms for the quality of piped water supplies.

The low credibility of public providers undermines users' willingness to pay

Willingness to pay (WTP) for improved water services might be expected to vary under different conditions of system administration, for two reasons, each related to the supplier's credibility:

- C WTP for promised service improvements will be a positive function of the confidence that the improved service will materialize (due to more efficiency and / or less corruption).
- C WTP will be an inverse function of the perceived scope for rent seeking. If users believe that they can improve services through political mechanisms, their WTP for them will be lower.

In a national survey of water demand conducted for SANAA and the World Bank by the authors in 1995 (Walker and Ordoñez, 1995), households with a piped water connection and with a service inferior to 4 hours per day were asked if they would be prepared to pay a given price for an improved service, defined as: at least 4 hours a day of potable water at a good pressure. System administration had a clear impact on the responses. When the system administration is private (via a Patronato or Junta de Agua), the probability of acceptance is much higher. This effect is especially marked where the administrator is a Patronato.

Willingness to Pay estimates

Estimates were made of the average Willingness to Pay (WTP) for the improved system for each type of system administration (Table B1). The analysis shows much higher WTP for an improved water service among the users of services run by Juntas de Agua and Patronatos in the marginal barrios of Tegucigalpa, compared with both clients of SANAA and municipal clients. Within the public sector, WTP is higher when the administration is municipal, than when it is SANAA.

Table B1

Summary of willingness to pay estimates for improved water for different types of administrator

Lps/month	SANAA	Municipal	Patronato	Junta de agua
Average willingness to pay for improved water supply	18.7	21.5	44.8	36.6

These findings give support to the hypotheses that:

- C the credibility of municipally administered systems is somewhat higher than that of SANAA
- C private, community based administration leads to higher willingness to pay for improved water services, presumably because the perceived opportunities for rent-seeking are fewer.

The obvious policy conclusion is that the municipalized water systems should wherever possible be managed by enterprises, at arms-length from the local government, in order to discourage rent seeking activity by the systems' clients, and that private management can be expected to contribute positively to the improvement in system performance.

Note: For details on the econometric analysis reported here, see Annex 1.

CNSSP was established in 1991, when, as part of Honduras' first Structural Adjustment program, the IADB and World Bank proposed the creation of a non-political agency to set public services tariffs, including water, telephones, electricity and transport. Previously, the National Congress set tariffs directly. The CNSSP was given a general competency to regulate water tariffs. However, this statute stands in direct conflict with the right of municipal operators to establish their own tariffs, under the municipal legislation of 1990 and 1991 (Articles 84,85 and 86 with their corresponding regulations) (Chama, 1995). In practice, CNSSP has limited itself to regulating the SANAA tariff.

CNSSP's structure strongly suggests that it was conceived as a body for the political negotiation of public service tariffs, rather than as a technical body dedicated to the independent determination of the costs of the services and equitable mechanisms for their recovery. It is formally autonomous, but in practice is linked to the Transport Ministry. It has few resources at its disposal, with a budget of $100,000 per year from central government and just four professional staff, so it depends heavily on the regulated entities for information.

The fact that the Director has remained unchanged since the Commission began operations, in spite of the change of government in 1994, suggests some degree of independence from the Executive. However, the Government has an effective majority on the CNSSP. Its 14 deliberative members include the Minister of Transport, who chairs and has a casting vote, the Ministers of Finance and of Trade; the four professional staff of CNSSP (nominated by the executive); two Congressional representatives; two private sector representatives; two trade union representatives, and one representative of *barrio* organizations.

The tariff setting process has remained politicized, with long intervals between revisions leading to severe erosion of SANAA's real income by inflation. The water tariff was not adjusted for five years between 1990 and 1995. In 1995, a 100% rise was authorized - but inflation since the previous increase was 159% (table 11). The interval between tariff adjustments was similar when the Congress controlled the tariff directly.

Table 11
SANAA tariffs and inflation, 1990-95

Domestic tariff, Tegucigalpa	1990 (Aug)	1995 (Sept)	% increase
Cost of 35 M3, Lps.	14.9	30	101%
IPC	286.5	741.7	159%

The procedures followed for the negotiation of this increase highlight the politicized nature of the process. Before it was approved, the increase was discussed and informally approved in the Economic Cabinet, which simultaneously considered requests for tariff increases by the electricity and telephone companies and decided to give priority to SANAA's request. It was thought politically untenable that more than one increase should be approved. The law which established CNSSP (Decreto 85-91) stipulates that tariffs should be based on "the real economic cost of providing services to each category of consumers" (Article 1) (Rendón Cano 1995: 8). But in practice, the presumption is that tariffs will be well below this level. The 1995 tariff increase was based on a study of the income needed to cover annual operating costs.

d) Financing the low level equilibrium

The Government finances SANAA's deficits through a series of subsidies, most of which are not transparent, including: capital grants for project finance, which in reality contain large elements of

operational financing; the payment by central government of all interest and amortization on the debt related to SANAA investments; and the partial non payment of electricity charges and chemicals costs.[10] In this context, SANAA's day-to-day financial management problem reduces to the generation of sufficient cash from tariffs to cover the payroll. This has provided an objective basis for alliances between the union leadership and successive SANAA managers, since the principal goal of each is to secure sufficient tariff income. As a result, tariff increases normally transmit rapidly into pay rises; this in turn has strengthened political resistance to tariff increases.

Table 12 analyses SANAA's 1994 financial balance, showing how different subsidy elements contributed to the company's operations.[11] Current revenue was L.55 mn compared with current expenditure which totaled L.123 mn, including an estimated L.50 mn of interest charges on the US$160 mn external debt on SANAA projects. The resulting L.68 mn deficit was financed by depreciation charges of L.12 mn and revenue subsidies of L.56 mn, including: the partial non payment of energy and chemicals bills, and the non payment of loan interest. In addition, SANAA received L.128 mn in capital transfers. Total subsidy to SANAA represented 0.68% of GDP and was the equivalent of 334% of the company's current revenue.

Table 13 projects SANAA's subsidy needs over the next decade, under three scenarios for system performance.[12] The baseline scenario supposes that performance on tariffs, on cost efficiency and on urban coverage remain unaltered at 1994 levels. In this scenario, the 100% tariff increase which was authorized in late 1995 is quickly eroded by inflation; staffing levels remain persistently high; and labor and capital productivity remain unchanged.

[10] In early 1997, the electricity company, ENEE, adopted a policy of charging SANAA for power, and began billing L.2 mn approx. monthly. When SANAA fell into arrears, the power supply to the administrative offices was cut and SANAA had to install a generator. However, it was deemed politically impossible to cut power to the water production and distribution systems.

[11] The SANAA revenue account presented here is based on the official one, but we have added in a series of expenses which are not normally registered by SANAA, most notably, debt interest.

[12] This section owes much to a study conducted by Ian Walker together with Raimundo Soto of ILADES, Chile, of the fiscal and equity impacts of the proposed water sector adjustment program in Honduras for the World Bank and IADB in 1995 (Walker, I. and Soto, R. 1995). The assumptions used for this exercise are described in full in Annex 2.

Table 12

SANAA's revenue account and estimated subsidy flows, 1994

	Lps. mn	% of revenue	% of GDP
Current revenue	55	100%	0.20%
Current expenditure	123	223%	0.45%
Labor	*29*	*53%*	
Energy	*10*	*18%*	
Chemicals	*8*	*15%*	
Debt interest/ 1	*50*	*92%*	
Depreciation	*12*	*22%*	
Other costs	*14*	*25%*	
Current balance	**-68**	-123%	-0.25%
Financing			
Depreciation	12	22%	
Revenue subsidies	56	102%	
Non payment of energy	*4*	7%	
Non payment of chemicals	*2*	3%	
Debt interest paid by government	*50*	92%	
Total revenue subsidy	**68**	123%	0.25%
Capital transfers	**128**	233%	0.47%
Total subsidy	**184**	334%	0.68%

Notes: 1/ We applied the 3.5% average interest rate for 1989-95 to the outstanding stock of SANAA related debt

2/ Nominal GDP in 1994 was Lps. 2.71 billion. The year end exchange rate was Lps.9.00 = US$1.00.

Source: Our analysis of data from SANAA, SECPLAN, Finance Ministry

On these assumptions, both costs and income rise in line with urban population growth (projected at 5% a year over the next decade) and the system would register revenue deficits rising from around 0.3% of GDP at present, to 0.7% in 2005. However, SANAA's cash-flow would continue to be viable, so long as the Government continues to absorb the debt service burden. Net of debt service and depreciation charges, the revenue deficit would remain stable and only slightly negative.

This underlines the point that the existing situation is an *equilibrium*, in the sense that it could continue, so long as the financial arrangements under which SANAA makes no debt service contribution are maintained. Nevertheless, if either the Government or the financial agencies which fund the capital program were not prepared to allow this, then the revenue and capital subsidies to SANAA would dry up, coverage would drop behind population growth, and service quality would deteriorate. In this way, a crisis could be forced by a political decision not to tolerate a continuation of SANAA's poor performance.

Table 13
Projected performance of the SANAA system: three scenarios

Millions of 1994 lempiras, and percentages	1994, real	1995, est.	2000, proj.	2005, proj.
Baseline: no improvement in performance				
Real tariff (% of 1994)	*100%*	*100%*	*104%*	*104%*
Unaccounted for water (% of production)	*50%*	*50%*	*50%*	*50%*
Coverage (% of urban households)	*83%*	*83%*	*83%*	*83%*
Current income	55	55	73	93
Current expenditure	123	151	321	370
Current Balance, L. mn	-68	-96	-248	-277
Current balance, % of GDP	-0.3%	-0.3%	-0.7%	-0.7%
Optimistic scenario: rapid improvement in performance				
Real tariff (% of 1994)	*100%*	*100%*	*317%*	*496%*
Unaccounted for water (% of production)	*50%*	*50%*	*38%*	*25%*
Coverage (% of urban households)	*83%*	*84%*	*88%*	*93%*
Current income	55	55	264	625
Current expenditure	123	151	309	352
Current Balance	-68	-96	-45	273
Current balance, % of GDP	-0.3%	-0.3%	-0.1%	0.7%
Intermediate scenario: moderate improvement				
Real tariff (% of 1994)	*100%*	*100%*	*317%*	*317%*
Unaccounted for water (% of production)	*50%*	*50%*	*45%*	*40%*
Coverage (% of urban households)	*83%*	*83%*	*86%*	*88%*
Current income	55	55	237	324
Current expenditure	123	151	310	355
Current Balance	-68	-96	-73	-31
Current balance, % of GDP	-0.3%	-0.3%	-0.2%	-0.1%

Source: Our calculations. Annex 2 details the assumptions used in preparing this table
The following general assumptions apply in all scenarios:

Real interest rate on sector debt	3.5%
Depreciation rate on net capital stock	2.5%
Urban population growth	5%
Total investment 1995-2005	$197mn

The second scenario in table 13 shows that if the system's performance were improved to normal levels, the subsidy would not be necessary. With average tariffs gradually increased five fold to the still-moderate level of L.2.0 ($0.22) per M3, with labor costs halved through the implementation of normal levels of efficiency, and with the programmed capital resources used relatively efficiently to increase coverage levels from 83% to 93%, the system could get out of deficits by the end of the decade and generate a revenue surplus of just under 1% of GDP by 2005, even after covering its debt service burden and financing the establishment of new planning, regulatory and technical assistance functions.[13] The third, intermediate, scenario shows that a more moderate tariff rise and more moderate productivity gains would enable the deficit to be stabilized at around zero.

[13] This scenario includes a provision for the cost of closing SANAA's operating systems (including redundancy payments and writing off the accounts receivable in the balance sheet) for their transfer to new operators. This cost would be comfortably recouped within the decade, as a result of the resulting cost savings and revenue increases.

e) The political economy of low level equilibrium

We may conclude that the Honduran water sector shows the classic symptoms of a "low level equilibrium trap", in which the systems are financially crippled by low tariffs and high costs. As a result, unless the water utilities can negotiate heavy subsidies, the quality of service provision must suffer. SANAA is the operator which has most successfully negotiated subsidies, mainly through the provision of capital grants from the central government. However, since the subsidy flow does not automatically rise when the system expands, the company loses money by expanding. Therefore, coverage tends to stagnate.

This tendency is reinforced by the fact that many production systems are gravity fed, so that the marginal cost of water is usually above the average cost, because the cheapest sources are exploited first. This implies that the necessary subsidy per connection for new connections is higher than that on the existing stock of connections.

This is the fundamental reason why SANAA has failed to expand services to cover Tegucigalpa's marginal *barrios*. In this context, the SANAA-UNICEF project to construct private systems, which SANAA then supplies with water at the block tariff, is a second best solution, made necessary by SANAA's inability to set tariffs to reflect the marginal cost of incorporating these *barrios* into the principal network.

The gainers from this status quo are the households who already have connections, and who receive heavily subsidized water services, and the employees of the staff-heavy SANAA system, concentrated mainly in Tegucigalpa. The principal losers are the households who cannot get into the system, because it is unable to expand fast enough; these are mainly concentrated in the marginal *barrios* of the cities, especially, Tegucigalpa.[14]

In recent years there has been increased awareness of the fundamental inequity of denying access to the urban water systems to the poorest *barrios*, and of the potential for realizing very large welfare gains by expanding water services to these communities. A formal estimate of the welfare gains which might be had from breaking out of the low level equilibrium is presented in a box below, and detailed in Annex 3. However, it has proved difficult to organize the political and legislative changes needed to make this possible. The vested interests arraigned in defense of the status quo have proved stronger than the forces in favor of reform. Section II turns its attention to a detailed analysis of the stalled process of reform in the Honduran water sector, and the prospects for its future success.

[14] Households within the system are the principal gainers from the status quo when its distributional impact is analyzed as a zero sum game. However, since tariffs are not even sufficient to provide for maintenance programs, and there is a limit to the amount of subsidy which can be extracted from the political system, the quality of their service is often low. In this sense, the status quo is a negative sum game. It is possible that households in the system would be net gainers from a feasible combination of tariff increases and service improvements.

The welfare gains from escaping from low level equilibrium

Increased coverage of piped water brings welfare gains for the households who previously had to get their water from alternative (more expensive and / or lower quality) sources, while increased tariffs imply losses for the households who previously received a service for less than marginal cost, and now have to pay more. However, to the extent that existing users are at present being supplied with water at an economic opportunity cost which is higher than their marginal willingness to pay for it, the reduction of their consumption will add to net social welfare. This is likely to happen if the increased tariff is implemented through billing for metered consumption. For the present study, these effects were quantified on the basis of survey data and SANAA data for water demand. The details of the estimates are explained in Annex 3.

Households without piped water in Tegucigalpa at present consume on average only 3.7 m^3 per month and pay L.27 per m^3. If they had access to the piped water system they would pay only L.2 per m^3 and would consume an estimated 33 m^3. The estimated net welfare gain per new client incorporated in the system is L.440 per month, which is comprised of the benefit from reduced costs for the water they already consume, coupled with the consumer surplus arising from the large expansion of their consumption, made possible by access to piped water. The whole of this gain is received by the new client. For the existing clients, the net welfare gain is L.16 per month. This is the sum of a net welfare loss for the consumer (who must now pay the full cost of his water, which was previously subsidized) and a net gain for SANAA (which previously supplied the water below cost).

If urban coverage in the existing SANAA systems were to be increased to 93% by 2005 (as per the optimistic scenario in table 13 of the main text), an estimated 29,000 households would benefit to the tune of L.440 a month. If coverage had stagnated at 83%, there would have been 243,000 households with coverage; the net gain for each of these is L.16 per month. The total net annual welfare gain is estimated at L.201 millions, equivalent to 0.7% of 1994 GDP. These results are not greatly sensitive to the form of demand curve which is chosen.

The reform of the sector aims to produce a transformation of the performance of all the urban water systems of Honduras - not just those run at present by SANAA. As documented in Section I.1, the systems already in municipal hands, which account for 65% of urban connections, exhibit similar weaknesses to those of SANAA. If reform were to produce similar improvements in all the urban systems of Honduras, then the annual welfare gains would amount to 2.1% of GDP.

II PERSPECTIVES FOR REFORM

Not surprisingly, in the face of the social, economic and fiscal costs identified in section I, the sector's performance has given rise to growing discontent among the agencies which provide capital finance to the water and sanitation sector. As a result, during the Callejas administration (1990-94), discussions began between the Banks and the Government about reform of the sector. During the Reina administration (1994-98) these discussions intensified, crystallizing in a proposal to strip SANAA of the operation of water systems, municipalizing the non metropolitan systems and establishing a private management contract for the Tegucigalpa system.

This proposal was supported by the offer of a sectoral adjustment loan, to be co-financed by the World Bank and IADB, to the tune of $65 mn. This would have been Honduras' fourth sectoral adjustment program, following operations in agriculture, energy and public sector modernization. The proposal was also reinforced by the IADB's reluctante to make finance further investments for the water and sanitation sector until reform has been implemented. However, by mid1996, the adjustment operation had been dropped due to the Government's failure to push through the necessary legislation.

This section traces the gestation of the reform proposal and presents a stakeholder analysis which shows why the reform effort stalled. It then goes on to argue that the failure was not simply one of political management. The original proposal suffered from two weaknesses which undermined potential support. In the first place, the reform centered on rapid municipalization, without establishing convincing mechanisms for strengthening the institutional capacity of the municipalities. And secondly, although the reform promoted the separation of system administration from political control, via the introduction of private and mixed capital service providers, the regulatory provisions of the early drafts of the reform legislation were weak, creating the fear that users might lose out when private service providers were introduced.

1. The failure of reform, 1994-96

In March 1994, the Banks agreed with SANAA on the broad lines of a reform to separate the functions of operation and supervision, through the municipalization of SANAA's systems. The Government established a high-level commission to supervise the process. Soon afterwards, a technical support group was established, with the participation of SANAA, the planning, health and finance ministries, and with the economic cabinet's economic policy analysis unit (UDAPE) as a secretariat. This group supervised a series of Bank-funded consultancies to develop the reform proposal.

For the Banks, the 1990 and 1991 local government legislation provided an obvious window of opportunity for the divestment of the SANAA systems, since it established that the operation of water and sanitation systems was a local government function. In response, some municipalities had already requested the transfer of their systems. The SANAA manager Jeronimo Sandoval strongly supported the idea of transferring SANAA's systems to municipal control and by early 1994 had agreed to the transfer of San Lorenzo and Puerto Cortés. However, the local government legislation did not cancel SANAA's competencies in this area; nor did it mandate the transfer of all systems. It was therefore necessary to promote further legislation.

The main elements of the proposal which gradually emerged from this process over the following 12 months were: a framework law for potable water services which would obligate the transfer of all SANAA's

systems to municipal control and close down SANAA; the creation of a sub-secretariat in the health ministry to handle sector planning and finance; the creation of a new national institute to supply technical assistance to the municipalities and for the development of rural systems; and the creation of an independent regulatory agency to supervise both water quality and tariff setting. In this framework, municipalities were expected to join together in multi-city water companies in order to take advantage of scale economies available in system administration (especially billing and financial management).[15]

However, in September 1994, just six months into the reform process, Mr. Sandoval was transferred to head the crisis-torn state electricity corporation, and was replaced as head of SANAA by Manuel Romero. Mr. Romero quickly made it clear that he was opposed to the disappearance of SANAA. He argued that SANAA's problems should be resolved though the development of an enterprise culture, and believed he could negotiate with the union a radical reduction in staffing and the flexibilization of work procedures, and that he could persuade the political authorities of the need for a significant tariff increase. The fact that the position of SANAA could change so radically following a change of manager, is a good measure of the lack of a national policy and the resulting personalization of sectoral strategy.

SANAA now proposed regionalization as an alternative to municipalization. The regionalization strategy was broadly similar to that being pursued by other water companies in the Central American region. The development of this strategy in Honduras was supported by Central America's regional body for cooperation between water companies, CAPRE, with technical assistance from the German development agency GTZ. It differs from municipalization in that it represents only an administrative decentralization of the national water company, rather than the passing of the systems into the ownership of alternative legal entities. In this context, SANAA began to resist the municipalization of the Puerto Cortés system and initiated an experiment with a regional office in La Ceiba. As a result, from late 1994 onwards, there were two reform strategies in play: the officially sponsored project, backed by the Banks, and SANAA's alternative strategy.

The conflict came to a head at a seminar held in mid 1995, where Mr. Romero showed considerable skill in lining up allies in support of his position. Among them were the planning ministry, which was also slated for closure under the state modernization program and which headed the Government's social cabinet; the mayor of Tegucigalpa, Oscar Acosta, who viewed the management of the metropolitan system as too big a task for the city government; and the existing body responsible for pubic service regulation (Comisión Nacional Supervisora de Servicios Públicos, CNSSP), which was reluctant to accept a reduction of its sphere of influence. The main supporters of the municipalization proposal were the Minister of the Presidency, Armando Aguilar Cruz (who was also secretary of the Presidential Commission for the Modernization of the State), and representatives of the mayors' association, AHMON. However, AHMON also expressed reservations with the formulation of the reform proposal, demanding municipal control of the regulatory and sectoral planning agencies (AHMON, 1995).

The opponents of the reform criticized the complexity of the proposed reorganization, questioned the wisdom of a rapid municipalization program, and argued that the closure of SANAA would damage rural water development and disperse a valuable central core of technical competence. They also highlighted the need for a two-thirds majority in Congress to close down SANAA, undermining the political viability of the scheme.

[15] The first and most general description of the proposed reform is laid out in the report of Chilean consultants Jorge Ducci and Maximiliano Alvarez (1994).

In the second half of 1995, the reform process entered a confused period as the different actors maneuvered for position and the Government and Banks adjusted their proposal to take account of the issues raised. By the start of 1996, they had reached agreement on a significantly revised proposal, under which the water systems would still be municipalized, but SANAA would survive, assuming the function of sectoral policy maker, also responsible for technical assistance and for rural water development. The new scheme is outlined in the box on the following page.

The Banks agreed with the Government to accept just two conditions for the first tranche of the adjustment program: the passing of the revised framework legislation, and the letting of a management contract for the Tegucigalpa system, where half of SANAAs connections and most of its worst inefficiencies are concentrated. This tactical move aimed to side-step Tegucigalpa's refusal to accept the system, with the intention of proceeding to a concession at a later date, following the Mexico City strategy (Foster, 1996:18).

In early 1996, consultants were commissioned to redraft the reform legislation and analyse the financial feasability of a private management contract in Tegucigalpa. The consultant's report concluded that, such is the inefficiency in Tegucigalpa, that a private manager could turn SANAA's existing $1 million annual operating deficit for Tegucigalpa into a surplus of about the same amount, even after paying the contractor for his services, and without raising tariffs. In May 1996, the Government placed an advertisement in The Economist newspaper, requesting expressions of interest from international firms.

Understandably, since that is where most of the vested interests in the status quo are housed, the proposal to privatize the Tegucigalpa system provoked the strongest opposition yet to the reform project. SANAA manager Romero now declared his public hostility to the proposal (El Heraldo, 17th June 1996 and El Nuevo Día, 21st June 1996). He was vocally supported by the leader of the SANAA staff union, Francisco Menjivar, who denounced privatization as a device to permit enormous tariff rises.

The proposed Honduran water sector reform: a summary

Organization of service delivery

- The water and sewerage systems owned by SANAA would be transferred to municipal ownership, free of debt, within two years.
- The law explicitly permits and encourages the use of private agents and mixed companies to run the municipal systems, through management contracts, leasing or concessions. While it also allows for the operation of systems by municipal departments, it stipulates that provision should by preference be indirect.
- Transitional provisions would clear the way for a private management contract for the Tegucigalpa system, to be let directly by SANAA, subject to municipal approval.

Regulation

- An independent regulatory commission would be created, with three commissioners nominated by the President. Two of the candidates would be taken from short lists provided by the colleges of civil engineers and economists. They would serve for 5 years (the presidential term is 4 years).
- There would be no national tariff, but the regulator would establish norms for calculating tariffs on a cost-plus basis, using the "model enterprise" system, and no operator would be allowed to tariff at above full efficiency cost. The regulator would oversee contracts made between municipalities and private agencies.
- Municipalities would be allowed to cross-subsidize within the water tariff but not to use water revenues to fund other services.
- The regulator would be free to declare "self regulatory" status for smaller systems.
- Access to public resources would be conditional on compliance with recommended practice on tariffing. This is conceived as a key regulatory mechanism, to promote good performance and avoid under tariffing by municipal operators.

Sectoral strategy

- SANAA would survive, responsible for strategic planning and technical assistance, and acting as advisor to the Finance Ministry on the allocation of public capital resources in the sector.

Rural water

- SANAA would also retain responsibility for the development of rural water supplies and for the implementation of capital works on a regional scale.

Source: Our summary, based on Rendon Cano, 1996

The SANAA union was given an easy pitch on which to bat, because the reform camp had failed to make a clear statement at an early stage about the regulator's mandate to control tariffs to efficiency levels. In fact, in early drafts of the proposed legislation, due to the reluctance of the municipalities to be subject to tariff regulation (justified, spuriously, by the principle of "municipal autonomy"), there was no provision at all for regulatory control of maximum tariffs. This allowed opponents to scare-monger about the tariff increases which would come with privatization. This was corrected in the July 1996 draft, summarized above, which was influenced by the intervention of IADB regulation specialists, but by that time, the damage had been done.

Mr Romero also produced a legal sophistry to block the idea of a private management contract for Tegucigalpa. He argued that SANAA's constitutive legislation does not allow for contracting private agents to run the water services in its remit. This was debatable, since there is a general provision for administrative delegation in Honduran law, which includes the option of delegation to private agents. Nevertheless, the Banks accepted that the management contract would have to be put on hold, pending the passing of the framework legislation, which would make explicit the legality of management contracts, leasing arrangements and concessions, and would allow SANAA directly to make management contracts during the transition period, with the agreement of the relevant municipality (see box).

This episode was the *coup de grace* for the adjustment loan. The Government's failure to replace Mr. Romero at the head of SANAA, even after he assumed a stance of direct public opposition, was the final blow to the credibility of Honduras' committment to the operation. With other sectoral adjustment loans in difficulty due to non-compliance with their conditionalities, with Honduras' IMF agreement in suspension due to missed fiscal targets, and with an election year in the offing, the Banks quietly deleted the Water and Sanitation Sector Structural Adjustment Credit from their work programs and began to search for an alternative strategy to secure passage of the reform.

In the meantime, they centered their efforts on preparing future investment credits and technical assistance for municipally run systems. Although both Banks continued to insist that the framework legislation was a *sine qua non* for future support to the sector, at the end of 1996, the legislation had still not been submitted to Congress, and the probability that it would be passed during the final year of the Reina administration seemed low.

2. A stakeholder analysis of the reform

Table 14 presents a stakeholder analysis, which identifies the forces lined up in favor of and in opposition to the reform. The analysis divides the actors into three groups: external actors; the Government (including the Congress); and other national actors. For each actor, it defines their potential interest in the issue, establishes what position they took and describes the resources at their disposal to pursue their interest.[16] This analysis underlines the weakness of support for the reform, making it easy to see why the adjustment operation failed to materialize.

In the first place, the Government's failure to coordinate the external support to the sector allowed each development agency to promote its own line. There was strong support for the reform only from the two Banks which proposed to co-finance the adjustment operation. USAID, which has long promoted municipalization, supported the transfer of water systems to municipal control, but had reservations about whether this should be mandatory rather than voluntary and opposed the proposal for a national regulator nominated by the central government.

[16] This analysis broadly follows the methodology developed by Crosby (1992 a, b, and c).

Table 14

A stakeholder analysis of the reform of the water sector

Group	Interest in the issue	Position on reform	Resources available
External actors			
World Bank	Promotes reform in infrastructure sector; needs to lend.	Strong support	Structural adjustment financing $30 mn
IADB	Finances the sector; needs to lend.	Strong support	Structural adjustment financing $35 mn plus ability to withhold investment loans to sector
International firms	Possible contracts for management and concessions; contracts for consultancy	Support	Ability to offer technical assistance to reform planning process
Bilateral lenders	Finance the sector	No general position; USAID supports voluntary transfer to municipal control but opposes compulsion and opposes the creation of a central-government controlled regulatory agency. GTZ opposes, JICA has not declared.	Financial resources and TA
CAPRE	Regional body for state water companies in C.A.	Opposed - promotes alternative regionalization strategy	TA; capacity to legitimize the opposition to reform.
OPS	Concerned with rural primary health	None declared	Few
Government			
SANAA	Existing agency - would lose the function of operating aqueducts, but would remain in charge of sectoral strategy.	Strong opposition - proposes alternative of modernization and regionalization	Technical capacity; controls information; able to dedicate itself full time to maneuvering on the issue; strong personal relationship of manager Romero with the President; strong support from SANAA professional staff for Romero
President	Ultimately responsible for defining Government policy and for relations with the World Bank and IADB.	Not apparently interested in the substance of the issue.	Ability to impose his decision within the Executive - but not on the Congress
Presidential Commission for Modernization of the State (CPME)	Prime agency for modernization; sees sector reform as a complementary element to the general program.	Strongly in favor - secretary Armando Aguilar Cruz (also Minister of the Presidency) is reform's main public advocate.	Ability to influence the President; access to TA from Banks; but not influential with the majority Flores faction in Congress (linked to Reina faction).
Economic Cabinet	Responsible for Balance of Payments management - needs adjustment loan to be approved. Also concerned with infrastructure efficiency.	Though originally skeptical, coordinator Guillermo Bueso supported the reform - but more due to need of the adjustment loan than support for reform per se.	Ability to influence President.

Continued.....

Table 14 (continued)

Group	Interest in the issue	Position on reform	Resources available
Health Ministry	General responsibility for water and sanitation - special interest in rural systems and for technical norms	No clearly defined position	Presides in the SANAA board; moral authority on health related impacts of sectoral reform
Planning Ministry	Was the ministry responsible for public investment program at the time - since then, it has been abolished.	Opposed - supported SANAA proposal (solidarity among bodies threatened with closure due to the adjustment program)	Presided in Social Cabinet which includes the Health Ministry, which in turn supervises the water and sanitation sector.
CNSSP	Existing tariff regulator - defending its turf.	Opposed - supports SANAA proposal	Technical capacity to question proposals
Congress	Would have to legislate to pass framework law	No declared position	Can block the reform
Other actors			
Municipalities	Would take over the aqueducts - potential for increased scope of activity, income, etc. But also high risks from taking over run-down systems which they are not well equipped to administer.	Diverse positions: AHMON broadly supports transfer of water systems to municipal control but wants a resource guarantee; would prefer that the transfer of systems were optional rather than compulsory; and opposes the creation of a national government controlled regulator. The municipality of Tegucigalpa is not interested in taking over the capital's water and sewerage systems, which are half SANAA's customers; many other municipalities are concerned about getting increased responsibilities without resources.	Lobbying power; also, could block the reform by refusing to accept systems.
SANAA union	Loss of jobs and of opportunities for corruption	Strong opposition to reform	Lobbying power (influential with leading deputies in the controlling Flores faction of Congress); scare tactics on price rises; xenophobic rhetoric
Users of SANAA system	Would face tariff increases but could get improved service	No clear public opinion on the matter	If politicians fear that the measure is unpopular with existing users, who are relatively articulate with access to the media, this could cause a Congressional veto
Non-users (marginal barrios)	Presently unable to get piped water due to low level equilibrium trap	No clear public opinion on the matter	Patronato organizations have lobbying power
National private sector (COHEP, Cámaras de Comercio e Industrias)	Fear of increased tariffs; opportunities for contracts	No clear public opinion on the matter	Very considerable lobbying power
Political parties	Opportunity to win popularity / risk of losing popularity	No important political group argued strongly for the reform; not viewed as a popular cause.	Influence of Liberal and National parties is decisive in Congress.

Other bilateral agencies such as GTZ and JICA effectively opposed the proposal, giving support to the alternative regionalization strategy promoted by SANAA. JICA provided grant funds to upgrade the La Ceiba system, giving credibility to the regionalization option and helping to dampen support for municipalization in that city. Since GTZ supports the association of Central American water companies, CAPRE, it has considerable moral authority in the field, so its absence from the reform camp was

important. Similarly, although it co-funded the initial diagnostic study which set the scene for the reform, the Panamerican Health Organization never declared its position.

The Government itself was divided on the matter. The only government agency strongly committed to the reform was the Presidential Commission for State Modernization (CPME by its Spanish initials); it also enjoyed the support of the Economic Cabinet, which needed the balance of payments resources the operation would have released, and which subscribed to the general project of improving the effectiveness of public infrastructure investment. But these met with strong opposition from SANAA and opposition also from the Planning Ministry and the existing regulatory agency, CNSSP, which wished to defend its turf. The President of the Republic appeared to have no position on the issue and was known to have a high personal regard for the SANAA manager, Mr. Romero. When the President failed to intervene to resolve the differences of opinion within the Government, the reform process simply disintegrated.

The analysis in Table 14 also highlights the weakness of national support for the project outside government circles. In the preparatory phase of the reform, research studies were commissioned which underlined the inequity of the exiting situation, but, in spite of the huge potential welfare gains to be had from improving the sector's performance, no "political entrepreneur" emerged to mobilize the potential support to be found among households without water, or with very poor services, which lose out from the status quo.

The *patronatos* (barrio committees) of the urban marginal sector remained indifferent to the debate on municipalization. Even the municipalities - purportedly the main gainers from the process - remained cautious, unsure of the consequences of taking on their water systems, keen to secure a guarantee of resources up front, and reluctant to accept external regulation.

The leaders of the private sector (organized in the Consejo Hondureño de la Empresa Privada, COHEP), normally the most vociferous proponents of privatization initiatives, had nothing to say on the issue of water privatization. The SANAA employees' union, on the other hand, intervened effectively in the debate, persuading leading Congressional politicians that if they supported the privatization proposal, they risked being tarred as authors of a violent tariff increase for water in an election year.

The absence of a strong national alliance in favor of the reform was fatal to the prospects for the reform legislation. The only strong supporters of reform with real power at their disposal were the Banks, because they hold the purse strings on balance of payments support and on future loans to the sector. But recent experience shows that the Congress will not automatically kow-tow to the Executive's macroeconomic necessities at the cost of its own political expediency. Throughout 1996, Honduras' IMF agreement was in suspension following the Congress' decision to push through income tax cuts which increased the consolidated public sector deficit above the agreed ceilings.

In the medium term, the IADB's ability to offer large scale finance for future water sector investments will be a crucial lever. The bank can insist on satisfactory progress on sector regulation, organization and performance in return for new funding. Just as in the past, when centralization was in fashion in the water sector, the IADB prevailed on SANAA to take over the systems of Tela, Juticalpa and Ceiba in return for financial support,[17] the bank can now force the transfer of systems to municipal control. He who pays the piper, as the old say has it, calls the tune.

[17] Interview with Luis Moncada Gross, June 1995

Nevertheless, the political process of reform would be eased, and the prospects for the successful functioning of the new model would be improved, if the legitimate concerns expressed by some of the reforms' opponents were addressed. The two most controversial aspects of the reform were: the proposed rapid municipalization of al SANAA's systems; and the absence of a sufficiently clear regulatory guarantee for users. The following sections discuss each of these points in detail. Section three discusses the issue of municipalization, and section four focusses on the issue of regulation in the context of increased private involvement.

3. The debate over municipalization

The rapid municipalization of service delivery is a central plank of the proposed reform. All SANAA's water systems would be passed to the ownership of their respective municipalities within two years, free of debt (Rendón Cano, 1996: Articles 13, 14 and 15). However, the latest (July 1996) version of the draft legislation, summarized on page 23, leaves open the possibility that in some cases this may not happen, in which case SANAA would continue to run the systems (Ibid: Article 16). The inclusion of this clause at a late stage in the drafting process was a tacit acknowledgment of the widespread skepticism about the capacity of many municipalities to manage their water systems.

Nevertheless, it remains the case that in recent years, the main form of political mobilization for water sector reform has been organized around the demand for transfer of SANAA systems to municipal control. This has happened normally where SANAA systems have been in a state of collapse and where local political leaders have seized on the resulting popular discontent. In two cases, San Lorenzo and Puerto Cortés, these mobilizations led to the transfer of system administration to municipal control. This section discusses the results of these initiatives, and also looks at SANAA's establishment of a decentralized regional office in La Ceiba, as an alternative to the municipalization strategy. Each of these experiences gives pointers for the problems and potentialities of a national decentralization process.

a) Recent experiences in municipalization

Since 1993, in the context of the process of political and administrative descentralization which followed the the municipal legislation of 1990-91, SANAA has delegated responsibility for management, operation and maintenance of aqueducts to local governments in San Lorenzo, Puerto Cortés and Tela. In each case, the ownership of the system remained with SANAA. The first two cases were piecemeal initiatives in response to local political pressures for improvements in water supply and in each case the system inherited by the municipality was in extremely poor condition. In Tela, where the system was in a better physical state due to a recent investment program, the transfer was promoted by SANAA, apparently in a crude attempt to discredit municipalization.

The first delegation was made in February 1993 to San Lorenzo, a port city of 18,000 people located in southern Honduras. The city had serious problems with water sources and coverage was estimated at only 55% of households, with very poor frequency of supply (once per week during some parts of the year). Physical losses were estimated at 60% of production. SANAA supported the delegation process, helping with a system survey, the inventory of fixed assets, and in staffing decisions.

At first, the municipality had problems dealing with the commercial administration and technical difficulties with the pumping system. Nevertheless, following the organization of a technical unit within the Engineering

Department, the municipality assumed full responsibility for the system. The municipal administration has replaced an important water main, opened new wells and incorporated new barrios into the system. Coverage has risen to 80%; physical losses have been reduced to an estimated 30%; and service frequency improved to every-other-day. Finance for these improvements came from a L.3.1million loan from Germany's KFW; and from the 4% of National Port Authority and customs revenues, which is granted to port cities under Decreto 72-86.

In Puerto Cortés, a north coast port city with a population of 50,000, the municipalization of water services was part of the winning platform of the Liberal Party in the 1993 mayoral elections. This followed protests (including closure of the main highway) when SANAA proved slow in repairing storm damage which severely interrupted supplies in 1993. In early 1994, SANAA approved the transfer. However, following the September 1994 appointment of Mr. Romero as General Manager, SANAA reversed its policy. As a result, the negotiation took 16 months to complete and the transfer was delayed to April 1995. Puerto Cortés was required to cover L.1 million in severance pay of former SANAA employees, offset against the accounts receivable inherited from SANAA.

Following municipalization, a respected SANAA engineer was recruited as system manager and the World Bank and USAID provided sustained technical assistance, the latter vía FUNDEMUN. Substantial improvementswere achieved in production (up by 40%) and in service frequency (up from 12 to 20 hours a day). USAID provided a $3 million loan (vía the Fondo Hondureño de Inversión Social, FHIS) to build a new dam on the Río Tulian, further expanding productive capacity, and Puerto Cortés funded $1.5 million of investment with its own funds (using the 4% received from the National Port Aurthority). Employees per 1,000 conexions were reduced from 7.6 in April 1995 to 4.7 at mid 1996. The metering of industrial consumption rose, from 102 functioning meters to 385 and in 1997 the municipality began a program to establish 100% metering of domestic consumption within two years. Illegal conexions were halved, monthly billing rose from Lps.132,000 to Lps.520,000, and revenues as percentage of billing increased from 61% to 103%, reflecting a successful effort to recoup accounts receivable. On the basis of these successes, in 1997 Puerto Cortés secured Congressional approval for the definitive transfer of the system’s ownership to the municipality.

In Tela, a north coast city of 35,000 inhabitants, SANAA invested L.6.4 million in water production, treatment and distribution in the early nineties, under the IADB’s Four Cities project, raising coverage to 87%. However, the system still registered very large losses (60%), mainly attributable to the non-separation of the old distribution system built by the Tela Railroad Company, and that billing and collection were non existent.

In February 1996, SANAA, unexpectedly and rapidly, ceded administration to the municipality; the transfer was seen by many observers as a deliberate attempt to discredit the strategy of rapid municipalization. The municipality recruited a relatively inexperienced manager, who initially recieved technical assistance from FUNDEMUN on how to cut physical losses; they recommended separating the Tela Railroad Company system and sectorializing the network. However, a conflict arose when the tests for this work led to service cuts in the city, the FUNDEMUN contract was suspended, and Tela began to depend on the SANAA regional office at El Progreso for support. These problems led to a meeting between the Ministry of Government, SANAA, AHMON and the Municipality of Tela, where it was reportedly agreed that future municipalizations would be more carefully planned.

b) SANAA'S regionalization strategy - the case of La Ceiba

La Ceiba, a north coast city with 100,000 inhabitants and around 13,000 domestic connections, suffered similar problems to Puerto Cortés in 1993, when tropical storms damaged dams, storage tanks and pipelines, severely disrupting services. Low rainfall in 1994 accentuated the crisis, when pumping from dry wells led to equipment damage. Local pressure for municipalization was strong. Sensitive to the danger of losing another major operation to municipal control, SANAA turned La Ceiba into a testing ground for the alternative strategy of regionalization.

In 1995, a Regional Office was created in the city, with autonomy in operations, including hiring, purchasing, and billing. All income generated by the La Ceiba system was to be locally retained to pay for the operation and maintenance of the system and to finance minor investments. The Regional Office also oversees rural aqueducts in the area of Atlántida, Colón and Yoro, but the income generated by these systems remains in their respective localities. However, the La Ceiba Regional Office has been characterized by managerial improvisation in the face of emergencies, and by early 1997 relations with Tegucigalpa had not yet reached a stable definition. SANAA still lacks a coherent operating model of regional decentralization.

SANAA has supported the La Ceiba initiative with a generous assignment of capital resources. In parallel with the creation of the Regional Office, SANAA obtained a Japanese grant of US$900,000 to install new wells, storage tanks and pumping equipment, to complement the gravity run system. Although the investment program was clumsily managed and the funds spent considerable time on deposit awaiting implementation, the eventual result was a marked service improvement. The proportion of clients with 24 hour service rose from 6% in 1994 to 88% in 1996. Other performance indicators also registered marginal improvements: employees per 1000 conexions fell from 5.2 in 1994 to 4.2 in June 1996 and, in response to the incentive that income is now locally retained, monthly billing quadrupled to L.425,000 in mid 1996, up from L.111,000 in 1994. However, revenues rose by only 40%, hardly ahead of inflation.

Meanwhile, the municipality of La Ceiba continued to recieve technical assistance from USAID, through the Fundación de Desarrollo Municipal (FUNDEMUN), to determine the technical and financial feasability of muncipalization. However, the improvement in service secured by the SANAA investment reduced local pressure for municipalization.

c) Lessons to be learned from the municipalization process

A definitive conclusion on the success of municipalization must await the generalization of the strategy and a review of performance in the medium and long run. But the experiences of San Lorenzo, Puerto Cortés and Tela offer some important pointers on factors which favor success in the municipalization process.

In the first place, the size of the municipality does not appear to be a decisive factor, within the range covered by these cases: in both San Lorenzo, the smallest of the three, and Puerto Cortés, the largest, the results are clearly positive. However, the "administrative delegation" of SANAA systems to the municipalities has been difficult to manage. It leads to a game in which each party seeks to unload responsabilities on the other and leaves open the possibility that SANAA might seek to cancel the arrangement once the principal problems have been resolved. The transfer of system ownership as

contemplated in the proposed reform legislation, and already achieved in Puerto Cortés, is a much cleaner device.

Secondly, municipalization is most likely to succeed where it responds to strong local political support and where willingness to pay for improved services is high. Therefore, the priority in the decentralization program should be given to the cities where the problems are greatest and the potential for service improvement is highest. However, these conditions are most likely to exist when the existing system of production and distribution is in serious difficulty. This in turn implies that the availability of technical assistance and access to capital resources are likely to be important factors determining the success of the transfer. In both San Lorenzo and Puerto Cortés, the interventions of bilateral and multilateral agencies proved important.

Thirdly, managerial capacity is likely to be a key bottleneck in any form of decentralization process in Honduras, where qualified human resources are scarce. Therefore, wherever feasible, municipalities should be encouraged to combine forces in order to exploit managerial and administrative economies of scale, and the pace of the reform process should be geared to the availability of the human and capital resources needed to make it a success, rather than being forced to meet a program of conditionality.

This, in turn, implies that an adjustment operation was not an ideal vehicle for the reform project, since such operations require that irreversible change be demonstrated within a limited time frame. It is not easy to ensure irreversible change simply through framework legislation, and the implementation of sector reorganization may take longer to organize than is normally permissible for an adjustment program. This sets up a tension between the need to design a program which is acceptable in terms of Washington's criteria for adjustment operations and the need to answer legitimate Honduran concerns about the risks of an overly precipitate process.

Fourthly, in the absence of a properly defined national scheme for the allocation of technical assistance and capital resources, there has been a "free for all" in which different agencies attempt to "adopt" one or more municipalities (rather as some aid agencies promote the "adoption" of a needy child). For example, USAID and the World Bank have supplied municipalized Puerto Cortés with technical assistance and capital resources, while JICA has supported SANAA's regionalization strategy through investments in La Ceiba. In this way, some important municipalities have been able to take advantage of programs financed by international agencies, but the result is not necessarily conducive to a rational reorganization of the sector, especially since each agency seeks to use the resources at its disposal to promote whatever model it happens to favor.

This experience highlights the need for a coherent national policy framework, tying the distribution of resources to an overall sectoral strategy. Generous injections of technical assistance and capital are likely to produce good results on service coverage and quality in the short run, regardless of the form of organization of service delivery, but these tell us little about the intrinsic virtues of the municipalization and regionalization options. The real test of both models is their ability to succeed when they are generalized, and in the long run, not their ability to succeed as "demonstration projects" with preferential access to technical and financial support.

4. The organization and regulation of service provision: key issues for the success of reform

In the long run, the key indicators of success are those related to physical and financial efficiency rather than those related to a city's capacity to attract public investment funds. If decentralization were simply to reproduce at a local level the same systemic weaknesses which have led to failure in the centralized model, the result might be a proliferation of mini SANAAs with the familiar pattern of political, workforce and user capture of system rents, stagnant coverage and poor service quality. In this sense, municipalization should not in itself be regarded as the central principle of sectoral reform.

For this reason, it is unfortunate that many supporters of the reform have seen it simply as part of the ongoing struggle to shift the balance of power between central government and the municipalities, and have little conception of the importance of the separation of functions between strategic planning, operation, and regulation for the future success of the reorganized sector. The municipal lobby wanted all of these functions under municipal control, which would have reproduced in a decentralized form the same systemic weaknesses which dog the existing, centralized, arrangements. For this reason, there is a need to develop a working model for the municipal management of water services, which protects them from political, employee or user capture, and to provide the municipalities with technical assistance to implement it. The following paragraphs detail the main aspects of such a model, as outlined in the latest version of the reform proposal.

a) System organization

The proposed legislation provides that municipalities may run their services directly (through municipal departments; autonomous agencies or public corporations) or indirectly, in the form of concessions, leases or management contracts to private agents or mixed capital companies, jointly owned by municipalities and private investors (Article 33), and allows for inter-municipal associations in any of these forms (Article 35). However, it stipulates that indirect provision is the preferred form of service delivery, which should normally be adopted unless there is no available agent or the cost of direct municipal service delivery is demonstrably lower (Article 37).

In this way, the legislation creates a strong presumption in favor of a clear organizational and financial separation of the water system from the rest of the municipality's operations. However, to turn this into a reality, it will be necessary to develop a model of independent provision which can be implemented in the major municipalities. To this end, during 1997, the IADB was developing a pilot project in Puerto Cortés to establish a mixed-capital company, co-owned by the municipality and private investors, which would operate the water and sewerage system on a leasing arrangement, following the Spanish and French model.

b) The regulatory system

The arrangements for sectoral regulation are central to the political viability of the plan for increased private sector participation. As argued above, the lack of clarity on this issue was the Achilles' heel of the proposal for a private management contract for Tegucigalpa.

As well as protecting users from over tariffing, regulation should also ensure that the expected return on the system's investment (the so-called "quasi-rent") is not subject to capture by local politicians or system users, via pressure on the regulator to limit tariffs to unreasonably low levels. In the absence of such a

mechanism, the fiscal costs of the publicly-run systems will be high, due to continued deficits, and it will be impossible to attract private capital to substitute for public resources and facilitate the expansion of coverage.

The 1996 draft legislation (summarized in the box on page 23) provides for a coherent national regulatory system. It contemplates the creation of a specialist three-person regulatory commission for water and sanitation services. The *Comisión Nacional de Agua Potable y Alcantarillado Sanitario* (henceforward, the Commission) would be nominated for five years by the President of the Republic, with two members to be taken from slates submitted, respectively, by the Colleges of Civil Engineers and Economists. To strengthen independence from political interference and regulatory continuity, the commissioners' five year period of office is different from that of the presidency (four years). The commissioners would themselves have different (overlapping) periods, rather than all being nominated at the same time. The Commission would be financed by a tariff component to be collected by all system operators; its expenditure budget would be set by the Congress of the Republic.

The Commission would have the power to limit maximum tariffs of any service provider to an efficiency level; the law would explicitly forbid the inclusion in the tariff of costs which result from inefficiency (Article 63). However, cross subsidies would be permitted. Any tariff change would require the Commission's approval and the operator would be required to supply the information necessary for its evaluation (Article 64). The definition of efficiency would be a "cost plus" or "rate of return" mechanism, apparently on a "model enterprise" basis, similar to the Chilean model (Article 66), which is considered more appropriate than a price cap for Honduras, due to macroeconomic uncertainty and the importance of guaranteeing a reasonable rate of return to private investors in the initial phase of private involvement.

The Commission would concentrate on the regulation of the relatively large systems, delegating the regulatory function in rural areas to the municipalities. The Commission would also supervise compliance with contractual agreements between the Government, municipalities and private operators. In accordance with the principle of "municipal autonomy", the municipalities would retain the freedom to set their own tariffs at levels below the recommended level. However, the tariff regime of any municipality which contracts loans with central government would be subject to regulation to ensure the financial viability of the loan.

c) The security of the regulatory environment

The regulatory provisions described above should provide a satisfactory basis for improved performance. However, they may not in themselves be sufficient to promote large scale private investment in the sector. Potential investors are concerned, not only with the content of the regulations, but also with the security of the regulatory environment. The letting of concessions to operate water services in the capital cities of Latin America has been dogged by the perception of high political risk, as illustrated most recently in Caracas.

Honduras has a poor international image for investment risk, due partly to macroeconomic factors (like debt overhang) but partly also to a recent history of arbitrary action by the executive, legislative and judicial authorities in matters involving transactions between the Honduran state and foreign companies (such as the privatization of state companies and the international letting of contracts for infrastructure development).

The reduction of this sort of risk depends on the whole process of political, administrative and judicial modernization, which is still at an early stage. The design of a sectoral strategy in relation to the need for public investment resources should be based on reasonable assumptions about that process. In the short to medium term, the best prospects for private sector financial involvement in large scale sunk investments are probably to be found in San Pedro Sula, where political risk may be perceived to be lower than in Tegucigalpa.

III. CONCLUSIONS AND RECOMMENDATIONS

The Honduran water and sanitation sector's overall performance in recent years has been disappointing, and both the systems operated by the centralized Servicio Autónomo Nacional de Agua y Alcantarillado (SANAA) and those operated by municipal governments show similar weaknesses. The causes of poor performance are related to the existing organization of the sector, in a classic pattern of low level equilibrium (LLE). The roots of the problem lie, firstly, in the confusion between sectoral planning and resource allocation (which are strategic or political functions) and system operation (which should be isolated from political considerations).

This problem has two important manifestations. At a national level, SANAA both operates systems and plays a leading role in determining priorities for capital resources. As a result, the SANAA-operated systems (especially that of the capital city, Tegucigalpa) get more than their share of subsidized capital resources. More generally, the political control of all the operating bodies, both at national and municipal level, means that water utilities lack financial independence and are subject to the capture of system rents by users, politicians and workers. This leads, amongst other things, to under-tariffing and results in inefficiencies in the scale of service provision (under-expansion / low coverage) and in the operation of existing systems (poor maintenance, low productivity and generally feeble commercial systems). It also leads to a vicious circle of low credibility and low willingness to pay, because users - with reason - do not believe that revenues from the water tariff will necessarily be used to improve services. New evidence on willingness to pay supports this conclusion.

The second factor contributing to the LLE is the generalized failure of the regulatory function. No organization exists to define or defend the rights and interests of the actual and potential users of water and sewerage services. The regulation of water quality is ineffectual and the only form of economic regulation is that of the SANAA tariff, which is highly politicized and directly contributes to under-tariffing. Municipal systems are effectively unregulated.

Non-transparent subsidies make SANAA's financial balance sustainable, and the existing situation is an equilibrium in the classic sense of the term, in that it could continue indefinitely, so long as the political settlements which facilitate it are left in place. But there is no objective need for wholesale subsidy to the sector. On reasonable assumptions about improved performance, SANAA's systems could be self financing within five years, and enormous potential welfare benefits are to be had from breaking out of the LLE.

The case for reform is therefore overwhelming, but the interests favored by the status quo are strong and well organized, so that the political task of organizing reform is a considerable one.
A stakeholder analysis of the failed Water and Sanitation Sector Structural Adjustment Credit, jointly supported by the World Bank and the IADB during 1994-96, highlights the problems of reform, and illustrates the limited capacity of adjustment finance to secure change in the absence of a clear national policy decision.

However, the reform's failure was not simply one of political management. The reform proposal itself suffered from important weaknesses, which undermined support. In the first place, the proposal made a central principle of municipalization, but failed to address the poor performance of many existing municipal systems, and placed insufficient emphasis on the need to protect system operation from political interference.

Most municipal governments in Honduras suffer from similar credibility problems to those of the central government, so a proposal which did not address these issues was bound to be unconvincing to many.

Secondly, as a result of the municipalities' reluctance to be subjected to a national regulatory agency, the reform proposal did not adequately address the issue of regulation until it was too late. Early drafts of the legislation concentrated on linking municipalities' access to capital resources to good financial performance. The emphasis was on the use of incentives to avoid under-tariffing, but there was no regulatory provision to prevent over-tariffing. This led to a setback when the municipality of the capital city, Tegucigalpa, refused to take over its water system, which accounts for half of SANAA's operation, and in response, a plan to privatize the management of the metropolitan system was hurriedly tacked on to the reform. In the absence of a clear regulatory guarantee for users, the reform's opponents had a field day with the prospect of a private operator levying extortionary tariffs.

In the final draft of the reform proposal, completed in mid 1996, most of these issues are satisfactorily resolved. The law creates a presumption in favor of indirect forms of service provision, in which the opportunities for political capture are minimized, and the regulatory arrangements are well conceived. The study concludes that reform effort should now proceed on parallel tracks, at national and local levels. The approval of the framework law and creation of the national regulatory, planning and technical assistance bodies, should be complemented by the development at municipal level of a workable model of indirect service provision. This could first be applied in existing municipal systems, ready to be extended to the SANAA systems once the law is passed.

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INTERVIEWS CONDUCTED

Luis Moncada Gross	Coordinator, Presidential Commission for Modernization of the Water and Sanitation Sector in Honduras, June 1995.
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LIST OF ABBREVIATIONS

AHMON	Asociación Hondureña de Municipalidades
BID	Banco Interamericano de Desarrollo
BIRF	Banco Internaciónal de Reconstrucción y Fomento (World Bank)
CNSSP	Comisión Nacional Supervisora de Servicios Públicos (Honduras)
CPME	Comisión Presidencial de Modernización del Estado (Honduras)
COHEP	Consejo Hondureño de la Empresa Privada (Honduras)
CAPRE	Comité Coordinador Regional de Instituciones de Agua Potable y Saneamiento de Centroamerica, Panamá y Republica Dominicana.
DGEC	Dirección General de Estadísticas y Censos of the Republic of Honduras
DIMA	División Municipal de Aguas (San Pedro Sula)
FUNDEMUN	Fundación para el Desarrollo Municipal (Honduras)
GTZ	Gesellschaft fur Technische Zusammenarbeit. (German technical assistance agency)
IADB	Interamerican Development Bank
JICA	Japan International Cooperation Agency
OPS	Organización Panamericana de la Salud (Panamerican Health Organization)
OMS	Organización Mundial de la Salud (World Health Organization)
SANAA	Servicio Autónomo Nacional de Agua y Alcantarillado (Honduras)
USAID	United States Agency for International Development
UDAPE	Unidad de Análisis de Políticas Económicas (Government of Honduras)
UDIP	Unidad de Docencia e Investigación en Población (Universidad Nacional Autónoma de Honduras)

ANNEX 1

THE EFFECT OF SYSTEM ADMINISTRATION ON WILLINGNESS TO PAY FOR IMPROVED WATER SERVICES : ECONOMETRIC EVIDENCE

A national survey of water demand conducted for SANAA and the World Bank by the authors in 1995 (Walker and Ordoñez, 1995) provides interesting insights into the credibility of different sorts of system administration in the eyes of the users.

Willingness to pay for improved water services might be expected to vary under different conditions of system organization, for two reasons:

- Willingness to pay for promised service improvements will be a positive function of the respondent's confidence that the improved service will materialize (due to more efficiency and/or less corruption).

- Willingness to pay will be an inverse function of the perceived scope for rent seeking. If users believe that they can achieve better services through political mechanisms, their willingness to pay to get them will be lower.

Therefore, if publically run systems have relatively low credibility as service providers, and are relatively prone to rent seeking behavior, one would expect them to report lower willingness to pay than that observed among the users of private systems.

In the survey, households with a piped water connection with a service inferior to 4 hours per day were asked if they would be prepared to pay a given price for an improved service, defined as: at least 4 hours a day of potable water at a good pressure. Although the survey was not designed for this purpose, the structure of the sample allows us to analyze the impact of the type of system administration on willingness to pay for water. The question was answered by 601 households: 230 SANAA clients, 110 with municipally run systems, 106 with systems administered by Juntas de Agua in their barrios (part of the SANAA-UNICEF project in Tegucigalpa) and 155 with systems administered by patronatos at a barrio level. These households were distributed geographically as follows: 304 in Tegucigalpa; 174 in Choluteca, of which 125 were SANAA clients and 49 were clients of the municipality; 61 in Santa Rosa de Copán (a municipal system); and 62 in Comayagua (a SANAA system).

The analysis was conducted using SPSS' multivariate logistical regression procedure, which allows us to identify the impact of system administration on willingness to pay, independently of the impact of other potential causes of difference. Twelve independent variables thought likely to affect willingness to pay were tested: system administration, price offered for the improved service, present payment for piped water, household income, frequency of the existing service, a wealth index based on artefact tenure; expenditure of money and time on getting water from alternative sources, education and sex of the respondent, the presence of a flush toilet in the household, and the geographical location. Of these, nine (including system administration) are included in the best available model of factors affecting the probability of a positive response by the household. The results are reported in Tables A1.1.

Table A1.1
The relationship between system administration and willingness to pay for water in Honduras

Econometric estimate	B	Average value	Units	Elements of a	Significance	R
Price offered for improved system	-0.058				0.000 ***	-0.28
Monthly household income	0.000	2,048	L./month	0.20	0.043 **	0.05
Present exp. on piped water	0.020	15		0.30	0.013 **	0.07
Exp. in water from coping sources	0.004	32.7	L./month	0.12	0.013 **	0.07
Time spent fetching water	0.000	190	Mins/month	0.06	0.116	0.01
Frequency of water service		%	Weighted B			
1 = (daily)	-0.671	0.268	-0.18			
1 = (not daily)	0.398	0.732	0.29			
Weighted coefficient:				0.11	0.009 ***	-0.08
Wealth (artefact) index	0.000	6856	Index	0.00	0.026 **	0.06
Years of education	0.061	6.3	Years	0.38	0.011 **	0.07
Administration SANAA	-0.682			-0.68	0.000 ***	-0.13
Administration Municipal	-0.519			-0.52	0.011 **	-0.07
Administration Patronato	0.839			0.84	0.000 ***	0.15
Administration Junta de Agua	0.362			0.36	0.054 *	0.05
Constant	0.539			0.88	0.000 ***	

Predictive capacity of the model

	Predicted		
Observed	Accept	Don't accept	% correct
Accept	246	77	76%
Don't accept	97	180	65%
		Overall	71%

Significance levels

1%	***	V.High
5%	**	High
10%	*	Good
> 10%		Low

Estimate of Willingness to Pay	SANAA	Municipal	Patronato	Junta	Weighted average
ß	0.058	0.058	0.058	0.058	
a	1.04	1.20	2.56	2.08	
Average, median WTP (=a/ß), Lps.	17.9	20.7	44.1	35.8	28.3
Positive integral of WTP, C', Lps.	23.1	25.2	45.3	37.9	31.8
Cases analyzed	230	110	155	106	601

Interpretation of the table

The statistic B reported in the first column of Table A1.1 indicates the direction and size of the impact of each independent variable on the probability that a household will accept the improved system. When B = 0, the impact is zero; when B is negative, the impact is negative; when B is positive, the impact is positive. Each of the variables included in the model has the expected direction of impact. In both models, willingness to pay for an improved service varies positively with household income, present expenditure on piped water, present expenditure on coping sources (both in time and in money), wealth, and education. The variables which have a negative impact are: price of the improved system and the frequency of the existing service (the better it is, the lower willingness to pay for improvement).

System administration has a clear impact. When the system administration is public (SANAA or municipal) the probability of accepting any given price for an improved system is lower; however, within the public sector, municipal administration reports significantly higher WTP than SANAA administration. When the system

administration is private (via a Patronato or Junta de Agua), the probability of acceptance is much higher. This effect is especially marked where the administrator is a Patronato.

All the variables included in each of the two models report significance levels of 10% or better, except for time fetching water from coping sources in the linear model, whose significance is 11.6%. The inferential validity of the reported impact for each variable is reported in the "Sig" column. Three stars indicate a probability that the variable's coefficient is really zero (i.e. the probability of a "type one" error) is under 1%, two stars, that it is under 5% and one star, under 10%. If there is no star, the data are not significant at the 10% level. The diagnostic statistics also confirm that system administration has a relatively large impact, compared with the other independent variables in the model.[18] The linear model successfully predicts 76% of yes answers and 65% of no answers, for an average of 71%.

Willingness to Pay estimates

To concretize the impact of system administration on Willingness to Pay, estimates were made of the average WTP for the improved system, in Lempiras per month, for each type of system administration. These estimates are reported at the bottom of each table. The logistical function which was estimated has the form: $P(yes) = 1/ 1+e^{-z}$. The estimated coefficient z of the logistical function reflects the change in household utility ascribable to the improvement in the system: $z = ?V = a - B_1A_1$. In this expression, ? V is the compensated variation in household utility. The constant term a represents the joint impact of all non-price variables on V; A_1 is the cost of the improved system (i.e. the reduction in income which the consumer must accept in order to get the improved system) and B_1 is a coefficient which reflects the marginal utility of income. The estimate is made on the basis of a representative household. For categorical variables, a weighted coefficient is calculated, based on the proportion of households in each category.

The value of a is then calculated by applying their respective B coefficients to the average value of each independent variable encountered in the survey database (see column "Average Value"). The value of a for each type of supplier has a series of common elements, associated with household income, expenditure on piped water, expenditure on coping sources, time used fetching water, the frequency of the service, wealth, and years of education, totaling 1.17 (Table A 1.1) .

But a also has an element particular to each type of system administration, which is negative for SANAA (-0.68) and municipalities (-0.52), but positive for patronatos (0.84) and juntas de agua (0.36). This gives values a (reported in the second line of the Estimate of Willingness to Pay at the bottom of table A 1.1) ranging from 1.04 for SANAA, 1.20 for municipal suppliers, 2.56 for patronatos and 2.08 for juntas de agua. Average and median WTP is then calculated as a/ß, where ß, which is -1 times the B_1 coefficient for the price variable, is constant for all types of administrator, at 0.058. The value of integral positive WTP is also reported; this is greater than the average as it excludes the negative range of the area under the logistical curve, which crosses the vertical axis before probability reaches unity.[19]

Additionally, a WTP estimate was made using an empirical distribution estimator, which is applied to the survey data without assuming any functional form (table A1.2, on the next page). This estimation technique calculates the

[18] The R statistic measures the relative contribution of the different variables to changes in the probability of acceptance. As well as taking account of the coefficients for the impact of changes in the independent variables, this statistic also takes account of the ranges of values observed for each independent variable. The bigger R, in absolute terms, the more important is the variable to the explanation of observed changes in the probability of accepting the improved system

[19] For a discussion of the empirical estimation of WTP from survey data, see Ardila (1993) and McConnell (1995). The estimates reported here use Ardila's methodology for the econometric estimate of WTP, but is calculated using SPSS, not in LIMDEP, and use McConnell's methodology for the empirical distribution estimator.

proportion of households whose reply falls in each price range, assigns to this group the average price of the range, and calculates overall WTP as the resulting weighted average. For instance, in the case of SANAA clients, 44% fell in the range zero to L.19, whose average price is L.9.5; 15% fell in the range L.20 to L.29 (average L.24.5); 11% in the range L.30 to L.49 (average L.39.5), 8% in the range L.50 - L.59 (average L.54.5) and 22% in the range L.60 or more (for this latter group the lower bound value of L.60 is assigned). Average WTP is them simply calculated by the following sum:

WTP = 0.44*9.5 + 0.15*24.5 + 0.11*39.5 + 0.08*54.5 + 0.22*60 =L. 29.6

The results of these estimates are summarized in Table A1.3. Although the absolute value of WTP varies considerably between the different forms of estimation, in each case, the analysis shows much higher willingness to pay for an improved water service among the users of services run by Juntas de Agua and Patronatos in the marginal barrios of Tegucigalpa, compared with both clients of SANAA and municipal clients. The results also show that WTP is higher when the administration is municipal, than when it is SANAA.[20] These findings give support to the hypotheses that:

- the credibility of municipally administered systems is somewhat higher than that of SANAA, and/or that municipal clients' expectation of capturing rents via lower tariffs is lower, compared with that of SANAA clients.
- However, the main difference is between the public and private suppliers. Private, community based administration generally leads to higher willingness to pay for improved water services, presumably because the perceived opportunities for rent-seeking are fewer.

The obvious policy conclusion is that the municipalized water systems should wherever possible be managed by enterprises, at arms-length from the local government, in order to discourage rent seeking activity by the systems' clients, and that private management can be expected to contribute positively to the improvement in system performance.

[20] The differences between the four types of administration are smallest in the empirical estimation. This arises because this form of estimation does not control for the impact of the other independent variables. Income and wealth (both positively correlated with WTP) are higher among the SANAA and municipal clients than among the clients of the private systems (predominantly in marginal barrios). This offsets the effect of system administration on WTP and, as a result, the reported difference in WTP is smaller than that reported in the econometric estimate.

Table A 1.3. Summary of willingness to pay estimates from different functional forms

Lps/month	SANAA	Municipal	Patronato	Junta de agua
Linear function (av. and median)	18.7	21.5	44.8	36.6
Empirical estimator (average)	29.6	34	42.5	39.7

Table A 1.2
Willingness to pay estimates using a Turnbull empirical distribution estimator
SANAA Clients

Price offered, L./ month	L. / month	20	30	*40*	*50*	40 - 50	60	>60	**Total**
% of users who would vote in favor of the price	%	56	41	*28*	*32*	30	22	n.a.	
Probability that a household would accept	P (si)	0.56	0.41	*0.28*	*0.32*	0.30	0.22	0.00	
Probability that a household would not accept	Fj	0.44	0.59	*0.72*	*0.68*	0.70	0.78	1.00	
Price range corresponding to the "no" answer	C.	0 - 19	20 -29	*30 - 39*	*40 - 49*	30 - 49	50 - 59	>60	
Average price in the range	C.	10	25	*35*	*45*	40	55	60	
Probability distribution function / 1	Pj = (Fj - Fj-1)	0.44	0.15			0.11	0.08	0.22	1.00
Estimate of average willingness to pay / 2	C.	4.2	3.7			4.2	4.5	13.0	**29.6**
Municipal clients									
Price offered, L./ month	L. / mes	20	30	40	*50*	*60*	50 - 60	>60	**Total**
% of users who would vote in favor of the price	%	81	57	27	*24*	*28*	26	n.a.	
Probability that a household would accept	P (si)	0.81	0.57	0.27	*0.24*	*0.28*	0.26	0.00	
Probability that a household would not accept	Fj	0.19	0.43	0.73	*0.77*	*0.72*	0.74	1.00	
Price range corresponding to the "no" answer	C.	0 - 19	20 -29	30 - 39	*40 - 49*	*50 - 59*	40 - 59	>60	
Average price in the range	C.	10	25	35	*45*	*55*	50	60	
Probability distribution function / 1	Pj = (Fj - Fj-1)	0.19	0.24	0.30			0.01	0.26	1.00
Estimate of average willingness to pay / 2	C.	1.8	5.9	10.3			0.7	15.3	**34.0**
Patronato clients									
Price offered, L./ month	L. / mes	20	30	40	*50*	*60*	50 - 60	>60	**Total**
% of users who would vote in favor of the price	%	91	86	46	*35*	*39*	37	n.a.	
Probability that a household would accept	P (si)	0.91	0.86	0.46	*0.35*	*0.39*	0.37	0.00	
Probability that a household would not accept	Fj	0.10	0.14	0.54	*0.65*	*0.61*	0.63	1.00	
Price range corresponding to the "no" answer	C.	0 - 19	20 -29	30 - 39	*40 - 49*	*50 - 59*	40 - 59	>60	
Average price in the range	C.	10	25	35	*45*	*55*	50	60	
Probability distribution function / 1	Pj = (Fj - Fj-1)	0.1	0.04	0.40			0.10	0.37	1.00
Estimate of average willingness to pay / 2	C.	0.9	1.0	13.8			4.7	22.1	**42.5**
Junta clients									
Price offered, L./ month	L. / mes	*20*	*30*	20 - 30	40	50	60	>60	**Total**
% of users who would vote in favor of the price	%	*64*	*79*	71	60	33	26	n.a.	
Probability that a household would accept	P (si)	*0.64*	*0.79*	1	0.60	0.33	0.26	0.00	
Probability that a household would not accept	Fj	*0.36*	*0.21*	0.29	0.40	0.67	0.74	1.00	
Price range corresponding to the "no" answer	C.	*0 - 19*	*20 -29*	0 - 29	30 - 39	40 - 49	50 - 59	>60	
Average price in the range	C.	*10*	*25*	15	35	45	55	60	
Probability distribution function / 1	Pj = (Fj - Fj-1)			0.29	0.11	0.28	0.07	0.26	1.00
Estimate of average willingness to pay / 2	C.			4.3	3.8	12.2	3.7	15.6	**39.7**
Total									
Price offered, L./ month	L. / mes	20	30	40	50	60	>60	**Total**	
% of users who would vote in favor of the price	%	71	63	32	29	26	n.a.		
Probability that a household would accept	P (si)	0.71	0.63	0.32	0.29	0.26	0.00		
Probability that a household would not accept	Fj	0.29	0.37	0.68	0.71	0.74	1.00		
Price range corresponding to the "no" answer	C.	0 - 19	20 -29	30 - 39	40 - 49	50 - 59	>60		
Average price in the range	C.	10	25	35	45	55	60		
Probability distribution function / 1	Pj = (Fj - Fj-1)	0.29	0.08	0.32	0.03	0.03	0.26	1	
Estimate of average willingness to pay / 2	C.	2.8	1.9	10.9	1.2	1.6	15.6	**33.9**	

Notes:
1. In ranges where the function Fj declines, the observations have been averaged to produce a monotonically increasing function. The survey observations which have been averages are in italic with a grey backgound.
2. For a detailed explanation of the deriviation of the WTP estimates, see text.

ANNEX 2
ASSUMPTIONS USED IN PROJECTED PERFORMANCE OF THE SANAA SYSTEM

Table A2.1. Assumptions used in the projected performance of the SANAA system (Table 13 in main text)

	Baseline: no performance change	Optimistic scenario	Intermediate scenario
Current income Tariffs	Political constraints on tariff setting remain severe. The 1995 tariff increase is eroded by inflation during 1996 and the real tariff remains at the 1994 level of L.0.4 (US$0.05) per m^3 through the rest of the projection.	The new municipal managers gradually raise average tariffs to five times their 1994 level of US$0.05, reaching L.2.00 (US$0.25) per m^3 by 2005.	Tariffs are increased gradually to three times the 1994 level: L.1.2 (US$0.15) per m^3 in 2005.
Coverage	The system expands at 7% per year, just enough to keep abreast of urban population growth. Coverage stagnates.	Connections increase at 8% per year, 1% ahead of urban population growth, allowing urban water coverage to rise from 83% of households in 1995 to 93% in 2005.	Connections grow at 7.5% per year, allowing urban coverage to rise to 88% by 2005.
Unaccounted for water	Unaccounted for water remains at 50%.	Unaccounted for water is reduced from 50% to 25% over the next 10 years.	Unaccounted for water is reduced from 50% to 40% over 10 years.
Current spending Wages and salaries	Employment per 1,000 clients remains at around 12, while real wages remain stable, so that both the workforce and the real wage bill grow in line with the number of connections (7% per year).	The SANAA workforce is paid off and the municipal systems establish workforces at the DIMA average of 5 per 1,000 clients. Real wages are increased by 15%. The result is a 50% reduction in the wage bill in real terms. Thereafter, productivity growth of 2.5% per year allows a 8% annual increase in connections while staffing grows only 5.5% per year, permitting a steady further fall in employees per 1,000 clients.	The SANAA workforce is paid off and the municipal systems establish workforces at the DIMA average of 5 per 1,000 clients. Real wages are increased by 15%. Thereafter, staff grows in line with the annual increase in connections; no productivity growth is supposed.
Energy, chemicals and other operating costs	These costs expand in line with the number of clients.		
Investment	The investment pipeline of $197 million as projected in Table 2.1, based on SANAA's existing plans, is implemented equally in the three scenarios. However, capital productivity varies. The investment cost per new connection is $1,600 in the baseline projection, $1,300 in the optimistic scenario and $1,450 in the intermediate scenario, so that the growth of new connections is higher in the optimistic scenario. The high cost per connection reflects the high costs of a new production system for Tegucigalpa when La Concepción is exhausted.		
Debt interest	Is fully charged to the system at the rate of 3.5% per year observed in 1990-94.		
Depreciation	Set at 2.5% per year of the net assets of the system (sufficient to cover amortization on the associated debt in 40 years).		
Planning, regulation and technical assistance	These functions are not established. Zero expense.	These functions are established at an annual revenue cost of L.9 mn (US$1 mn).	
SANAA's closure costs	Not incurred.	Estimated at L.107 mn, assuming that the accounts collectable are written off.	

Table A 2.2

Honduras - investment pipeline for water, SANAA systems

Millions of 1994 US Dollars

	Total value of project	Start date	Years of execution	Real 1994	Est. 1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Accumulated net financial investment				160	197	214	233	227	243	259	275	290	305	297	290
Continuing projects	87				41	22	24								
New Projects															
- *New dam for Tegucigalpa*	110	1999	5						22	22	22	22	22		
Total , new projects	110					0	0	0	22	22	22	22	22	0	0
Total investment	197				41	22	24	0	22	22	22	22	22	0	0
Annual investment % of GDP					1.32%	0.68%	0.72%	0.00%	0.62%	0.59%	0.57%	0.55%	0.54%	0.00%	0.00%

Source: our calculations based on SECPLAN data

Note: this Program includes only investment in water projects within the SANAA system

ANNEX 3 THE WELFARE COSTS OF LOW LEVEL EQUILIBRIUM

This annex estimates the welfare gains to be had if the existing SANAA systems were to break out of the existing low level equilibrium onto the growth path described in the "optimistic" scenario of table 13, compared with remaining in the "baseline" scenario of stagnant coverage, high costs and low tariffs.

Increased coverage brings welfare gains for the households who previously had to get their water from alternative (more expensive and / or lower quality) sources, while increased tariffs imply losses for the households who previously received a service for less than marginal cost, and now have to pay more. However, to the extent that existing users are at present being supplied with water at an opportunity cost which is higher than their marginal willingness to pay for it, the reduction of their consumption will add to net social welfare. This is likely to happen if the increased tariff is implemented through billing for metered consumption.[21] Data for Tegucigalpa from a 1995 household survey of water demand, conducted by the authors (Walker and Ordoñez, 1995) allow us to determine the order of magnitude of these welfare effects, confirming that the expected gains greatly outweigh the losses.[22]

a) Demand estimates

The demand estimate is based on survey data for the water consumption and expenditure of households without piped water, and on SANAA estimates and survey data for the consumption and expenditure of households with piped water. The analysis supposes that typical households with and without domestic connections have identical water demand curves. The difference between them is that they face different prices, and therefore consume different quantities.[23]

In March 1985, households without a SANAA connection, which purchased its water from a variety of private sources, paid a weighted marginal price of L.26 per cubic meter and consumed on average 3.7 cubic meters per month (table A 3.1). Ideally, the demand estimate for SANAA's existing clients should be based on the metered consumption of un-rationed customers. However, no data are available for this variable. An approximation of the demand for this group was made, on the basis of SANAA's estimates for expected consumption coupled with survey data for expenditures of SANAA users on additional water from complementary sources. This gives an estimated average monthly consumption of 34 cubic meters, paying an average (weighted) marginal price of L.1.09 per meter. This should be regarded as an approximation; however, the order of magnitude is reasonable, compared with data for water demand in other Central American cities with similar income levels and climatic conditions.

[21] For a discussion of the welfare gains which result from water metering, see Savedoff (1993).

[22] Although the data for other municipalities would not be identical (due to different costs and different existing water expenditures for households outside the system), the direction and order of magnitude of the effects analyzed here should be similar.

[23] Water demand in Tegucigalpa is overwhelmingly determined by the price and quality of the service (Walker and Ordoñez, 1995). While other factors such as income, wealth, education, and sex of the respondent are significant independent variables, their coefficients are relatively small. It is therefore reasonable to suppose that the water demand curve is similar for the population sectors with and without a piped water system, in spite of the more advanced social condition of those with water systems.

Table A 3.1
Estimated demand curves for water in Tegucigalpa, based on survey data

A. Households without piped water		*Notes*
Weighted marginal cost of water sources used, L./M3 (P1)	26.00	
Average consumption, M3/month/household (Q1)	3.7	
B. Households with piped water and metered consumption		
Water from SANAA		*1*
Marginal price of SANAA water L./M3	0.6	
Average monthly household consumption of SANAA water, M3	33.3	
Water from other sources		
Weighted marginal cost of water used, L./M3	24.50	
Average consumption, M3/month/household	0.690	
Total		
Weighted marginal price for water from all sources, L/M3 (P2)	1.09	
Average consumption of water from all sources, M3/month (P2)	34.0	
C. Coefficients of a linear demand curve		*2*
ALPHA	29.04	
BETA	-0.82	
Point elasticity for households without piped water (P1,Q1)	-8.54	
Point elasticity for households with piped water (P2,Q2)	-0.04	
D. Coefficients for a logarithmic demand curve		
Constant term, a	34.00	
Elasticity for logarithmic function, e	-0.68	*3*

Notes

1. Data taken from SANAA commercial register for the marginal tariff and average household consumption of metered clients, in December 1995

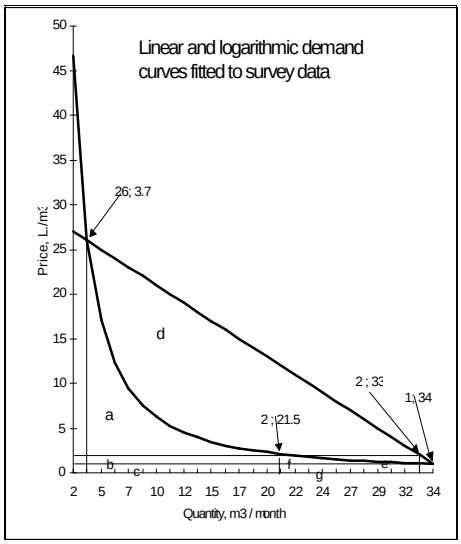
2. The estimated curve is: $P = ALPHA + BETA\ Q$

3. The estimated curve is: $Q = aP_e$

On the basis of these data, two demand curves were estimated: a linear curve and a logarithmic curve. The coefficients of the curves are reported in table A 3.1; the diagram on the following page illustrates the two curves. The financial analysis of the SANAA system, presented in Table 13 in the main text, showed that a five-fold increase of the average tariff to L.2 per cubic meter (from the average of L0.4 per meter paid at present) would be sufficient to permit the system to expand ahead of population growth and improve service quality for existing clients.[24] The diagram shows this change in the form of a tariff of L.2.0 per cubic meter; it is assumed that the average and marginal tariff would be equalized. The impact of this change on demand depends on which demand curve is used. With a linear demand curve, point elasticity is very low for existing clients (-0.04) but very high for households without piped water (-8.54). The average household facing a price of L.2 per cubic meter and an improved piped service (which obviates the need to use complementary sources) would consume 33 cubic meters monthly. The logarithmic demand curve shows a constant

[24] This is equal to US$0.22 per cubic meter at the 1994 exchange rate of L.9 = US$1.00. This figure is not based on a calculation of the system's long run marginal cost (LRMC), rather, it arises from a projection of break-even income, and is likely to be somewhat below LRMC, due to the relatively low financial cost of the existing (infra-marginal) connections. We use it here in lieu of a reliable up to date estimate of LRMC.

elasticity of -0.68, so that the reduction in demand for the existing clients is much sharper, while the increase in demand for new clients is less. Each would consume 21.5 meters per month when the price is L.2 per meter.[25]



b) Welfare estimates

On the basis of these data, the net annual welfare gains per household from increasing urban water coverage were estimated, for each type of demand curve (tables A 3.2 and A 3.3). In each case, the gains are distinct for existing SANAA clients and new clients. In the case of the linear function, net welfare gain per new client incorporated in the system is L.440 per month; the whole of this gain is received by the new client.[26] For the existing clients, the net welfare gain is L.16 per month. This is the sum of a net welfare loss for the consumer (who must now pay the full cost of his water) and a net gain for SANAA (which previously supplied the water below cost). With the logarithmic demand curve, the net gain per new client is L.158 per month (reflecting lower per capita consumption than that predicted by the linear curve) and the net gain per existing client is L.36 per month (reflecting a greater reduction in uneconomic consumption by existing users).

Table A 3.4 summarizes the total welfare impacts predicted from the two demand functions. The global welfare impact would depend on the number of households who would have water if coverage does not expand, and the number who will enter the system as the result of the expansion. If urban coverage in the existing SANAA systems were be increased to 93% by 2005 (as per the optimistic scenario in table 13 of the main text), an estimated 29,000 households would benefit. If coverage had stagnated at 83%, there would have been 243,000 households with coverage. The total net annual welfare gain is estimated at L.201 millions on the basis of the linear demand curve and L.160 millions on the basis of the logarithmic curve. The annual net welfare gain is estimated at 0.7% and 0.6% of 1994 GDP, respectively.

The reform of the sector aims to produce a transformation of the performance of all the urban water systems of Honduras - not just those run at present by SANAA. The municipal systems, which account for 65% of urban connections, exhibit similar weaknesses to those of SANAA. If reform were to produce similar improvements in all the urban systems, then the welfare gains would be much greater than those described in the preceding paragraph, amounting to 2.1% of GDP per year on the basis of the linear demand estimate and 1.6% using the logarithmic function (table A 3.4).

[25] The predicted expenditure of L.66 per month from the linear curve is 4% of average household income and that of L.43 per month from the logarithmic curve, is 2.8% of income. Average household income in March 1995 was estimated at L.1,511 (Walker and Ordoñez, 1995: 15).

[26] It is assumed that the existing price paid existing suppliers of water from coping sources is a good reflection of the social opportunity cost of the resources used to produce and distribute this water, and that these resources would be reassigned to other socially useful purposes. It is also assumed that L.2 per meter will exactly cover the opportunity cost of the water to be supplied by SANAA to these new clients. As a result, both SANAA and the alternative suppliers to be displaced has a zero net welfare change.

Table A 3.2
Welfare analysis of increased water coverage in Tegucigalpa - linear demand function

	Without project	With project	Change	Notes
A New consumers				
I Private consumers				
Consumption, M3 / month	3.7	33	29.3	
- SANAA	*0*	*33*	*33*	
- Other source	*3.7*	*0*	*-3.7*	
Expenditure, L./month	96.2	66	-30.2	
- SANAA	*0*	*66*	*66*	
- Other source	*96.2*	*0*	*-96.2*	
Gross Welfare	101.75	511.35	409.6	
Tariff paid	96.2	66	-30.2	
Net welfare	5.55	445.35	439.8	
II SANAA				
Total cost (= social opportunity cost)	0	66	66	
Income	0	66	66	
Net gain	0	0	0	
III Employees and suppliers	96.2	66	-30.2	
- Of SANAA	*0*	*66*	*66*	
- Of other sources	*96.2*	*0*	*-96.2*	
B Existing SANAA clients				
I Private consumers				
Consumption, M3 / month	34	33	-1	
- SANAA	*33.3*	*33*	*-0.3*	
- Other source	*0.7*	*0*	*-0.7*	
Expenditure, L./month	30.8	66	35.2	
- SANAA	*13.9*	*66*	*52.1*	
- Other source	*16.9*	*0*	*-16.9*	
Gross Welfare	512.85	511.35	-1.5	
Tariff paid	30.8	66	35.2	
Net welfare	482.05	445.35	-36.7	
II SANAA				
Total cost (= social opportunity cost)	66.6	66	-0.6	
Income	13.9	66	52.1	
Net gain	-52.7	0	52.7	
III Employees and suppliers	83.5	66	-17.5	
- Of SANAA	*66.6*	*66*	*-0.6*	
- Of other sources	*16.9*	*0*	*-16.9*	
C SUMMARY	**New consumers**	**Existing SANAA clients**		
Change in gross welfare	409.6	-1.5		
SANAA gain	*0*	*52.7*		
Consumer gain	*439.8*	*-36.7*		
Worker / supplier gain	*-30.2*	*-17.5*		
Change in net welfare	439.8	16		*1*
Consumer gain	*439.8*	*-36.7*		
SANAA gain	*0*	*52.7*		
Worker / supplier gain	*0*	*0*		*2*

Notes

1 Net welfare = Gross welfare - Social opportunity cost.

2 Supposing all inputs are paid their social opportunity cost

Table A 3.3

Welfare analysis of increased water coverage in Tegucigalpa - logarithmic demand curve

	Without project	With project	Change	Notes
A NEW CONSUMERS				
I Private consumers				
Consumption, M3 / month	3.7	21.5	17.8	
- SANAA	*0*	*21.5*	*21.5*	
- Other source	*3.7*	*0*	*-3.7*	
Expenditure, L./month	96.2	43	-53.2	
- SANAA	*0*	*43*	*43*	
- Other source	*96.2*	*0*	*-96.2*	
Gross Welfare			105	
Tariff paid			-53.2	
Net welfare			158	
II SANAA				
Total cost (= social opportunity cost)	0	43	43	
Income	0	43	43	
Net gain	0	0	0	
III Employees and suppliers	96.2	43	-53.2	
- Of SANAA	*0*	*43*	*43*	
- Of other sources	*96.2*	*0*	*-96.2*	
B EXISTING SANAA CLIENTS				
I Private consumers				
Consumption, M3 / month	34	21.5	-12.5	
- SANAA	*33.3*	21.5	*-11.8*	
- Other source	*0.7*	0	*-0.7*	
Expenditure, L./month	30.8	43	12.2	
- SANAA	*13.9*	43	*29.1*	
- Other source	*16.9*	0	*-16.9*	
Gross Welfare			-4.8	
Tariff paid			12.2	
Net welfare			-17	
II SANAA				
Total cost (= social opportunity cost)	66.6	43	-23.6	
Income	13.9	43	29.1	
Net gain	-52.7	0	52.7	
III Employees and suppliers	83.5	43	-40.5	
- Of SANAA	*66.6*	*43*	*-23.6*	
- Of other sources	*16.9*	*0*	*-16.9*	
C SUMMARY	**New consumers**	**Existing SANAA clients**		
Change in gross welfare	104.7	-4.8		
SANAA gain	*0*	*52.7*		
Consumer gain	*157.9*	*-17.0*		
Worker / supplier gain	*-53.2*	*-40.5*		
Change in net welfare	158	36		*1*
Consumer gain	*158*	*-17.0*		
SANAA gain	*0*	*52.7*		
Worker / supplier gain	*0*	*0*		*2*

Notes

1 Net welfare = Gross welfare - Social opportunity cost.

2 Supposing all inputs are paid their social opportunity cost

Table A 3.4

Estimates of the welfare impact of rasing tariffs to L.2 per cubic meter and increasing coverage in urban systems to 93% by 2005

	Net monthly welfare gain per household			Number of house-holds in 2005 /1		Total net annual welfare gain			
1994 Lempiras	Consumer gain	Producer gain	Net gain per household	SANAA systems	All urban systems	SANAA systems		All urban systems	
		Lempiras		*Thousands*		*Millions of Lempiras*	*% of 1994 GDP*	*Millions of Lempiras*	*% of 1994 GDP*
a. Linear demand curve									
Households which would have water with 83% coverage	-37	53	16	243	701	47	0.2%	135	0.5%
Households which have water due to expansion of coverage to 93%	440	0	440	29	84	154	0.6%	446	1.6%
Total households with water				272	786	201	0.7%	581	2.1%
b. Logarithmic demand function									
Households which would have water with 83% coverage	-17	53	36	243	701	104	0.4%	300	1.1%
Households which have water due to expansion of coverage to 93%	158	0	158	29	84	55	0.2%	160	0.6%
Total households with water				272	786	160	0.6%	461	1.6%

Source: Our estimates, based on survey data. See text for explanation and Annex 3 for detailed benefit calculations.

Notes: 1/ Assumes 7% p.a. urban population growth 1993-2005 (extrapolated from 1988-1993)

Population projection used in welfare estimates:

	Parameters	1993	2005 (A)	2005 (B)	Difference
SANAA urban connections		142,000	272,129	242,868	29,261
Proportion of population covered		83%	93%	83%	
Number of persons covered (5 * conn)	5	710,000	1,360,647	1,214,341	146,306
Population (rate of growth 7%)	5%	855,422	1,463,061	1,463,061	
All urban connections		410,000	785,726	701,239	84,487
Proportion of population covered		83%	93%	83%	
Number of persons covered (5 * conn)	5	2,050,000	3,928,629	3,506,196	422,433
Population (rate of growth 7%)	5%	2,469,880	4,224,332	4,224,332	