Water pricing in Honduras:
A political economy analysis[1]

By

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Abstract

This paper explores water pricing policy in Tegucigalpa, the capital of Honduras, in a political economy perspective. I argue that current water prices are too low and significantly below long-run marginal cost, and demonstrate that water prices must be raised signifiantly over the next 10 years for projected demands and supplies to be in balance. I also argue that low water prices has a number of adverse allocational and distributional consequences. I then go on to discuss various (exteral and internal) actors' stakes in maintaining or changing the current water pricing regime, and discuss some potential mechanisms by which more efficient prices can be implemented.

1. Introduction

The purpose of this paper is to analyze some aspects of water pricing policy in Tegucigalpa, the capital of Honduras. Honduras is a small Central American country with about 5 million inhabitants, and is among the poorer countries in Latin America, with GDP per capita of about 2000 USD. Almost 1 million people currently lives in the Tegucigalpa area. While Honduras is relatively resource-rich, with plentiful rainfall, its management of the water sector is problematic. A key problem is water pricing policy, whereby the price charged of those households with access to piped water is only about 20 % of long-run marginal cost (LRMC) of supplying this water. The low price of water (in combination with other institutional weaknesses) has a number of adverse and interrelated allocational and distributional consequences. First, there are adverse distributional consequences, since as we document, the water price is much higher for households with no access to piped water, than for households with such access. Moreover, those without water access belong predominantly to the low-income household groups living in the "barrios marginales". Secondly, low water prices lead to wasteful water use among those with access. Thirdly, low revenues for the water administration implies that its ability and incentives to improve and maintain the water system is low. This leads among other things to high water losses and poor service for those served. A particular problem in this context is the existence of a major national park close to the capital, La Tigra National Park. This park supplies a large fraction of the city's water and is today severely threatened by deforestation, which is currently not dealt with by the water administration. Fourthly, low water prices also depress the water administration's incentives to extend water to larger groups of households, thereby reinforcing a situation where a large group of poor households is left without running potable water.

There is thus need for reform, both of water pricing and of the general water allocation system in Tegucigalpa. A reform proposal has been designed by the World Bank and the Inter-American Development Bank, together with certain domestic interests. This package has however met with great resistance by political actors on the home front, and today no actions are being undertaken or seriously considered by the current Honduran government. A difficult but key issue, which we attempt to address in this paper, is thus how to come out of this stalemate.

The structure of this paper is as follows. In section 2 we study the water supply and demand situation in Tegucigalpa, currently and as projected up to 2010. We demonstrate that significant water price increases are required for water demand to be kept in line with projected supplies from existing sources,

and that the market clearing water price most certainly will reach the level of LRMC ahead of this time.

Section 3 looks in more detail at the implications of low water prices in Tegucigalpa. We note that the real water price today is reduced to only about half of its level in 1978. While management of the Tegucigalpa water system is currently in the hands of a government agency, SANAA, water prices are set by a government pricing board (CNSSP), which generally has incentives to keep water prices low. We argue that this incentive, in combination with high rates of general inflation over the period, seems to have been decisive for the actual development of water prices over this period. We then go on to discuss political and economic consequences of low water prices, for incentives to supply water, for water users' responses, and for overall allocational responses. We argue that these effects are largely negative, although we are not able to directly quantify most of them.

In section 4 we conduct a "stakeholder analysis", in which we examine different economic and political actors' incentives to maintain or change water prices, and these actors' ability to influence water policy in practice. We distinguish between three types of actors, namely actors external to the country, actors in government with direct political power, and other domestic actors. The second group of actors are crucial for policy changes to be enacted and carried out. Currently, however, the most important of these (in particular the President and Congress) seem to have no strong interest in water policy issues in general, nor in water pricing in particular. A reason for this in turn appears to be that voters (most of whom have access to cheap water today) are on the whole interested in maintaining the status quo, out of fear that water reform may lead to higher prices without equivalent offsetting personal benefits. The main (external) actors favorable to reform, namely the World Bank and the Inter-American Development Bank, have potential economic leverage over the Honduran government, but they currently have no strong domestic political allies, which makes it politically difficult for the Banks to require a water sector reform. We discuss the conditions that must be fulfilled, for successful pricing reform to be practically implementable. In general it appears that a condition for sucessful reform is some pressure by the Banks, together with an organization of political support from major voter groups. In particular, price increases must not be too rapid, and they must be accompanied by improvements in service for most households that today are already served. I also argue that increases in marginal water prices can go together with smaller increases in inframarginal consumption units for most households, such that the increases in household expenditure on water may be limited. This will make it easier to organize support for price reform on the grass roots level, at the initial stages of a reform.

The analysis presented in this paper is specific for Honduras, but many of the basic issues are far more general. I will in particular argue that most of the points mentioned in section 3 of the paper (on consequences of inefficient water policies) would apply also when analyzing similar problems in other developing countries, and that a "stakeholder analysis" of the type presented in section 4 is likewise necessary in most cases. As such the paper may thus be useful as a reference in a somewhat wider context.

While this paper focusses on water pricing policy, there are of course also other important aspects of water management and policy that here have been neglected. As we argue below, however, water pricing policy plays a very special and crucial role, and interacts with other aspects of water management in an amazing number of ways. This applies both to the effects of water pricing (discussed mainly in section 3), and the factors responsible for the actual policy chosen (which is the main topic of section 4).

2. Assessment of the current water supply and demand situation in Tegucigalpa[2]

2.1 The water supply situation

Currently, almost all of the water used in Tegucigapla stems from three main sources, namely Los Laureles, Concepción, and El Picacho which takes water from La Tigra National Park (LTNP, to be described in more detail below). The water stemming from LTNP cannot presently be stored and its supply is consequently subject to seasonal and annual variations, according to variations in precipitation. Los Laureles and Concepción contain dams with capacity of approxmately 10 million m^3, and 35 million m^3, respectively.The seasonal and annual variations in supply from LTNP can consequently be smoothened with variations in tapping the water from Los Laureles, and in particular Concepción. The smoothing provided by these two subsystems is sufficient for all but very extreme variations in precipitation.

A particular characteristic of the water supply situation in Tegucigalpa is the fact that approximately 40 % of the city's water is supplied from La Tigra National Park, the first national park in Honduras, and one of the finest, located close to Tegucigalpa. Most of the park is covered by forest, although about

[2]Section 2 of the paper is based largely on Strand (1998).

20 % of it has been cleared, mainly by small-scale farmers for subsisitence agriculture.The park has a number of important resources. The most significant is its water. The amount of water produced from LTNP has in recent years been about 0.4 m3/second as an annual average, which is readily expandable to 0.7 m3/second, and possibly to1.5 m3/second.[3]The park also has very varied animal, bird and plant populations, with e.g. tucanes, wild hogs, and some large game such as pumas. It is also an important tourist attraction, with its many scenic views, waterfalls, and fascinating trails, and it has a siginficant potential for "ecotourism". The park is today severely threatened by further deforestation, both by small farmers wishing to settle or expand already existing operations, and by locals who exploit the park's fuelwood potential. Deforestation of the park would drastically reduce its value both as a water source for Tegucigalpa and as a park. Water pricing, and the way in which water revenues from the park are used, are crucial for the incentives to care for the park's resources, as will be commented on further below.

Table 1 sums up some main aspects of the current water supply situation in Tegucigalpa, and the expected future potential water supply given that no new sources are developed. In 1995-6 (with relatively normal precipitation), almost half of the water has been provided by Concepción, more than 30 % by Los Laureles, and only a little more than 20 % from LTNP.[4] The rates of distribution losses in these years appear to have been (at least) 27 %. Potientially these sources have a higher capacity for supplying water, which is partly be due to better management of aquaducts and sources and partly to lower rates of system loss (possibly to 20 %). The capacity from current sources is given in the second column from the right in the table. We here see e.g. that the fraction of water that can be supplied by LTNP is greater, almost 32 % of the total.

The long-run marginal cost (LRMC) of supplying water from additional sources, today not developed, is roughly estimated at 0.40 USD/m3 of gross water supplied, on the basis of total cost calculations related to the last developed current source (Concepción).[5] Allowing for a loss rate of 20 %, this corresponds to an LRMC per m3 supplied, of about 0.50 USD, or about 6.25 HNL per m3 supplied (at an exchange rate of 1 USD = 12.5 HNL).

[3]See Repp (1998) for more detailed discussion.

[4]The sources here are Salgado Artica (1996) for 1995, and SANAA (1997) for 1996.

[5]According to SANAA officials, the total cost of developint new sources are in the same neighborhood, or possibly somewhat larger. Using this figure thus implies a conservative estimate of the "backstop" water price to be calculated below.

Table 1: Current and immediate future water supply situation in Tegucigalpa. Million m^3 per year, and percentages of total capacity.

	1995	1996	Aver. %	Avail. given 27 % loss	Est. cap.	Cap. with 27% loss	Cap. with 20% loss	% of total cap.
Laureles	16.7	16.5	31.3	12.1	17.0	12.4	13.6	23.2
Concepción	20.0	27.0	44.3	17.2	30.0	22.0	24.0	40.9
LTNP	12.3	9.9	20.9	8.1	23.3	17.0	18.6	31.8
Other	2.5	1.1	3.4	1.3	3.0	2.2	2.4	4.1
Total	51.5	54.5	100	38.7	73.3	53.5	58.6	100

2.2 Water demand in Tegucigalpa

Since realized local demand for water is (almost) identical to local water supply by the existing system, realized demand in the years 1995-6 must more or less equal the figures given as supplied in the table 1 above. Table 2 shows the distribution of water use in Tegucigalpa in 1995, according to three main user groups, namely domestic households with access to piped water, commercial and government users, and households with no piped water supply. As shown in table 2 below, approximately 60 % of the population in Tegucigalpa has a legal piped water connection tied to SANAA's system, while another 22 % is supplied by either private networks or are tied illicitly to SANAA's system. The rest of the public has no direct water access, and their consumption must come out of either or all of the three mentioned categories. The current total consumption of water among this group is however small and possibly below 1 million m^3 per year. Thus amost all of the water consumed by domestic users in Tegucigalpa today is consumed by those 60 % who have legal individual SANAA connections, and those about 20 % in addition who have illicit connections to the SANAA system or are supplied by a private system. Among these the consumption however appears to be quite large. The average household consumption among regular SANAA customers is, according to avaliable sources, in the range of 350-

400 m^3 per year.[6] For comparison, it is considerably higher than in Oslo, Norway where this author lives (where the equivalent figure is about 200 m^3 per year), and where average consumption levels in other respects are generally far higher than in Tegucigalpa.[7] As a minimum, such a high figure immediately indicates a considerable potential for economizing on current water use, provided appropriate pricing and metering of the water.

We have no direct information on water consumption among consumers who are supplied either by an illegal SANAA connection or who are supplied privately. This consumption is however likely to be considerably below that of regular SANAA clients, because the service is generally inferior (with lower water pressure and fewer hours of daily supply), and because these households generally are in lower income groups (implying lower water consumption demand and less investments in private water pumping and storage). I have assessed their current realized demand per household at 100-200 m3/year. It is at least likely to be substantially higher than that of households without any domestic supply whatever, estimated by Walker et.al. (1996) at approximately 45 m3/year. The latter pay on average an extremely high price for their water, 26 HNL/m3 (in 1994).[8] Those with illicit and private connections are likely to face average water prices that are in between those offered by SANAA, and those facing households without supply. Our tentative assessment of the average prices facing these is approximately 6-12 HNL/m3.[9]

Table 2: Water demand in Tegucigalpa, 1995, according to main user groups.

[6]The reason why this number cannot be determined more exactly is that there are no data available on consumption of water among those with illicit or private connections. Since this consumption also comes out of SANAA's total supply, we can only determine the total consumption of all users with piped water connections, whatever type.

[7]To be fair, average household sizes are far greater in Tegucigalpa than in Oslo (approximately 6 versus 3). Also the climate implies that relatively high water use is required in Tegucigalpa, due to more need for watering and washing.

[8]While this seems extreme, it is not a unique situation. Many other countries are likely to have water provision systems with similar real price variations. An example is the water systems in Nigeria, aspects of which are reported in Whittington et.al. (1991).

[9]It would appear that those with illicit connections face a zero water price, as they do not pay for their actual SANAA supply. These households are however likely to buy a substantial amount of their water in the private market, as their tap supply service is likely to be poor. The prices we indicate here are correspondingly the average prices across all supply sources.

User type	Number of users	Consumption, SANAA, million m^3	Average consumption, m^3	Average price, HNL/m^3
Domestic households, SANAA connection	75 000	28.9	350-400	1.47
Commercial and government	4350	8.8	2023	4.06
Domestic households, other domestic service	25-30 000	1.0 (officially)	100-200 (?)	6-12
Domestic households, no service	20-25 000		45	26
Total		38.7		2.04

Sources: SANAA (1995).

It is important to stress that when here speaking of "water demand", we are in effect discussing realized demand and not necessarily what consumers ideally wish to consume given the unit prices they face. As documented by Walker and Ordoñez (1995), water service is substandard for all groups of consumers, in the sense that water pressure is low and water is available only during part of the day. An indication of this is that households of all categories appear to be willing to pay substantially (up to 1-2 times current water expenditures) for service improvements. Another indication is that when asked by Walker and Ordoñez what public services are most in need of improvement, about 40 % of all households put water supply on top, way ahead of any other issue (incidentally, the closely related issue of sewage disposal is put in a distant second place, with a little more than 10 %).

Although there are no definite statistics on the relationship between income and water service, Walker

and Ordoñez (1995) docmuent a strong tendency for water service to be far poorer in the marginal (in particular the higher-located) parts of the city (with low pressure and generally only 3-6 hours of service per day for regular SANAA customers), than in the wealthier parts (where households typically are served 9-12 hours per day at better pressure). This has implications for the analysis that follows below, since it means that a "true" equilibrium in the current water market (by which we mean that currently served consumers are allowed to consume freely at current prices) requires a higher water price than that currently prevailing in the market.

An important related issue is the relationship between income and type of service. Also here there are no definite statistics. Walker and Ordoñez (1995) however report that those with no service whatsoever (including those served by public wells, "llaves publicos") live almost exclusively in the "barrios marginales". In these areas close to 50 % of households belong to the unserved category, while in wealthier neighborhoods less than 5 % are unserved. Moreover, among the individuals sampled by Walker and Ordoñez, all those households reporting to spend more than 5 % of household income on water live in the barrios marginales. In these areas the average water expenditure for households with no domestic service was 7.2 % of household income, and for those with service 1.9 %. By contrast, in the wealthier areas the average expenditure for households with service was only about 1 % of income.

The more detailed SANAA water tariff strucuture in Tegucigalpa today is illustrated in table 3. The first figure in each line of the table gives the total (lump-sum) tariff, for consumption up to a maximum limit of 20 m3 for both households and businesses.The following figures represent average prices per m3 for total consumption when consumption is in excess of this minimum level. We see that households in normal consumption ranges (below 40 m3/month) pay relatively low prices, e.g., in the range 31-40 m3/month, 1.20 HNL/m3 or about 0.10 USD/m3. This is as already noted only about 20 % of LRMC (which I above have assessed at 6.25 HNL/m3).[10] For commercial and industry users (and for very large household users) the prices are generally higher and approach LRMC. The main problems are thus those related to prices for low- and moderate-consumption households.

Table 3: Margial water prices for SANAA customers in Tegucigalpa 1996-7, for different

[10]Notice one curious aspect of the water pricing scheme depicted in table 13. Since the figures are average prices for the entire consumption, marginal water prices are very high at the borderline levels between the different consumption ranges in the table. E.g., the water price at 40 m3 is 20 HNL/m3.

customer types, and consumption levels per month in excess of 20 m3/month. HNL/m3.

Consumer type	20 m3 or less	21-30 m3	31-40 m3	41-50 m3	51-60 m3	61 m3 up
Households	14	1.00	1.20	1.70	1.85	3.95
Comm.	46.80	2.55	2.75	2.95	3.25	4.70
Industry				175.50	3.90	4.70
Gov.				52	2.35	3.90

Source: SANAA (1995)

Table 4 shows projected population and its distribution according to main type of water use (legal public domestic service, other domestic service, or no service), up to the year 2010. The shares of the population in these three categories are assumed to remain constant. This is the same as assuming that the increase in water supply coverage exactly keeps up with the increase in population. Over the last 20 years public supply coverage rates have generally increased, albeit slowly. There is little to indicate that these rates will fall in the future; indeed, a reduction in public water coverage rates would amount to a significant political defeat for the sitting national government (if still in charge of water operations in Tegucigalpa), and will probably be avoided ar considerable cost.

In the last line in table 4 we estimate the distribution of the population in 2010 according to water supply modes, given constant coverage rates, while in the last line of the table the fraction of households with public piped water supply is instead assumed to increase to 85 %, approximately equal to the rate in San Pedro Sula today. This can be viewed as attainable but “optimistic”.

Table 4: Distribution of population according to type of main supply, given no change in relative

coverage of piped water.

Year	Estimated population (1000)	Public piped water supply	Supply by other domestic service	No service
1995	865	527	182	156
2010, no increase in coverage (61%)	1798	1097	378	323
2010, increase in coverage to 85%	1798	1528	146	124

Sources: Salgado Artica (1996), SANAA (1997).

It should be noted that the figures representing the initial fractions of the population, with the three different types of service, are controversial. Walker et.al. (1996) have made their own independent estimates of water coverage in Tegucigalpa. Their figures indicate that only 53 % of all households have a regular SANAA connection. In their report 16 % are claimed to have an illegal SANAA connection, while 16 % are tied to different private water systems from which they buy water, generally at far higher prices than the regular SANAA rates. Finally, they estimate that 15 % have no domestic coverage, and must buy water entirely from water vendors. Our figures are based on a somewhat higher coverage rate by SANAA, and lower coverage rates by illicit and private supplies.The overall outcome of these two sets of assumptions, for the future demand for water, is however approximately the same.

The following table 5 indicates the development of total water demand in Tegucigalpa, under the two scenarios given in table 4, assuming that the current water pricing policy is retained, and that realized demand per household with a given type of service is the same as currently.[11] In the table commercial demand (which includes government and industrial demand) is assumed to increase at the assumed

[11]Remember from the discussion above that this realized demand is generally below the "notional demand" that would have been realized with better service (e.g., water access at greater pressure and during greater parts of the day).

general rate of population increase, namely 5 % per year. Moreover, consumption per person for a given supply mode is assumed constant.[12]

We see that, with given coverage rates, water demand in Tegucigalpa will increase in proportion to the increase in population, at 5 % per year, and approximately double, from the current level of about 40 to nearly 80 million m^3 per year.

The last line in table 5 shows water demand under the alternative where coverage of regular household water service increases to 85 % by the year 2010. In this case we see that overall water demand instead increases to more than 100 million m3 per year, further widening the discrepancy between demand and supply at present prices.

Table 5: Total water demand in Tegucigalpa given current pricing policies, for different coverage rates in 2010. Million m^3 per year.

Year	Households	Commercial demand	Total demand
1996	30.5	9.3	39.8
2010, constant coverage rates	60.4	18.5	78.2
2010, increased coverage rates	83.2	18.5	101.7

These projections of water demand take as given the current price regime for water in Tegucigalpa. As

[12]Note here that a fraction of the population, about 18 % in the first scenario and about 8 % in the second, is assumed to have no domestic water service. Their actual consumption of water is however also basically provided by the same system. Today this group represents a very small fraction of total consumption of water, only about 2 % (according to Walker et.al. (1996)). Their service must be provided either from existing private or public taps, whereby water vendors resell water provided by these taps. Correcting for the change in demand from this group, as the coverage rate of piped water increases, will not noticeable affect our results in the following.

noted the average price paid by most households is 1 - 1.50 HNL/m3, and for commercial water users approximately 4 HNL/m3. We also assume that newly connected households will have the same average water consumption as originally connected ones. As newly connected households are likely to have below-average incomes, their water consumption once connected may be below average. In such a case our assumptions will tend to overestimate the increase in future water demand. On the other hand it must be remembered that potential improvements in service would draw in the opposite direction, tending to raise demand further for given prices.

Comparing the figures in tables 1 and 5 reveals that for all scenarios described, demand will considerably outstrip supply, given current pricing regimes and given that no new water sources are developed. Barring more severe rationing of water, this situation must be dealt with by increasing supply by developing new sources, or reducing demand by increasing water prices, or a combination of these.

An efficient allocation of water generally requires that all water users face prices comparable to those reflecting the scarcity of water in the system. With no new sources, such scarcity prices will be those equalizing supply and demand given the supplies already available. When new sources are to be utilized, the efficient price will be that which equals the long-run marginal cost of bringing new water into the system. In our calculations this long-run marginal cost (LRMC) is 6.25 HNL/m3. As a result, the efficient price should be at least as high as the current price, but no higher than the LRMC price of 6.25 HNL/m3. As long as the equilibrium market price (provided that all users face the same price) is below 6.25 HNL/m3 for given current capacity, this is the efficient price, and no new capacity should be added. When the market price for given capacity increases above 6.25 HNL/m3, new capacity should be added so as to keep the equilibrium market price at this level.

Note that the price charged of commercial users is already at a level of approximately 2/3 of LRMC. The price charged of households is by contrast only in the range 20-25 % of LRMC. Since household demand in addition represents about 80 % of total demand (in both the scenarios depicted above), it appears reasonable to concentrate the discussion of efficient water pricing, on prices of water facing households.[13]

[13]Note interestingly that the situation in Tegucigalpa, whereby households on the average pay only 20-25 % of total marginal water provision costs, is far from unusual. This particular issue is discussed at some length in the 1992 World Development Report (World Bank (1992)), which concludes that the normal situation in developing countries is that the public only pays around 20 % of total water costs at the margin. The fact that this is the "normal" situation should however not lead to complacency about it. Rather, it means that many of the political and economic factors leading to such

An essential aspect of the analysis of water pricing is the issue of how household water demand will respond to increases in water prices.[14] In effect, this amounts to attempting to trace a demand curve for water from households. Notice from table 2, that while the average water demand of households with tap water is about 33 m3 per month, and these pay slightly more than 1 HNL/m3 (in 1994), those households without tap water consume only about 3.7 m3 per month, and pay about 26 HNL/m3. Making the bold assumption that the demand function for these two groups are otherwise identical on the average, this yields two points on a common demand function.[15]

Under the assumptions adopted by Walker et.al. (1996), for water at prices intermediate between 1 and 26 HNL/m3, demand must be between 33 and 3.7 m3 per month. Walker et.al. (1996) postulate two alternative functional forms for such a demand relationship, namely a linear and a log-linear one.[16] Table 6 then indicates the water demand per household at different water prices. Provided that the demand curve is linear, we see that an increase in water price to 6.25 HNL/month implies a very small drop in demand, from 33 to 28 m3 per month. Under a log-linear demand curve the drop is much more substantial, to 10 m3.

Table 6: Water demand in Tegucigalpa, per household with tap water, based on Walker et.al.

distortions, have similar effects in many developing countries. It is important that these factors be explored, and the causes of the distortions remedied.

[14]An approach for deriving water demand responses, which focusses on supply quality rather than prices, is Humplick et.al. (1993).

[15]Note here again that far from all households with tap water have their water consumption effectively metered. With no effective metering the water price relevant for tracing the water demand function is rather likely to be close to zero.

[16]In accordance with arguments already made above, it may not be entirely reasonable to assume that the relationship between water demand and price is the same for these two groups. More likely, those without potable water are in lower average income groups than those with potable water in their homes. If the demand for water is elastic to income, the former should then lie on a lower demand curve (closer to the origin), than the latter group. In addition water consumption is less convenient for persons who do not have taps in their homes, leading them to use less water. Generally, such arguments imply that the true demand curve is steeper, and demand less elastic to price, than the respective curves indicated by table 10. Our focus on the linear alternative, and alternatives relatively close to that, can be seen as a way of partly accommodating such an alternative assumption about the demand functions for the different income groups.

(1996). m3 per household per month.

Price (HNL/m3)	Linear demand curve	Log-linear demand curve	Intermediate
1	33	33	33
2	32	22	27
3	31	17	24
4	30	13	22
5	29	11	20
6.25	28	10	19

Most likely the actual demand relationship in the relevant range is less elastic than that described by the log-linear relationship. The right column in table 6 shows an alternative case where this relationship lies midway between the linear and the log-linear one. In such a case average water demand among households with a piped water connection drops from 33 to 19 m3/month, when the price is increased up to the LRMC level of 6.25 HNL/m3. My own feeling is that the correct relationship in this range lies closer to the linear one, for the following reasons: 1) The upper end point on the demand curves as specified by Walker et.al. (1996) is likely misspecified, as water demand at a price of 26 HNL/m3 probably exceeds 3.7 m3/month, for those with water connections today. 2) For those household that do not have meters (or where metering is inaccurate) the demand is likely to be insensitive to price. 3) For many (or most) of those with current piped water, service is inferior, as water is available only during part of the day.[17] These are likely not to reduce their water consumption below current levels, at relevant water cost levels, given that they are secured satisfactory water service. 4) From arguments above, the log-linear relationship may grossly overestimate the potential for demand reductions, both in the short and long run. One piece of evidence in favor of such a view is that the demand response to the large increase in water prices from 1995 to 1996 was negligible.

[17]Se discussions of these issues in Walker et.al. (1996), and the two contingent valuation studies on the value of improved water service in Tegucigalpa, Walker and Ordoñez (1995), and Salgado Artica (1996). As already noted these find that the willingness to pay for improved service may be substantial (in the range of 40-50 HNL/month on the average). This is an additional strong indication that the water consumption of these groups of consumers will not drop by much, and perhaps instead increase, when a price hike is accompanied by an improvement in water service.

2.3 Market clearing water prices in Tegucigalpa, 1997-2010

We will now indicate "market clearing" water prices in the household consumer water market in Tegucgalpa, for future years up to 2010. Market clearing requires that supply equals demand at the given (clearing) price. For the relevant supply, the figures in the right-hand column of table 1 are taken to indicate the supplying capacity of the current water system. Possible increases in realized water consumption beyond this level must then be based on alternative water sources.

We will stress again that "market clearing" does not imply that we have a true equilibrium in this market. As already noted, today the market is generally out of equilibrium for consumers with domestic water service, since most of these are rationed or have inferior service. In addition a large group of households have essentially no service at all. When we here speak about " market clearing", we rather mean a situation where the level of service among the group of households with access to piped water remains at the current level. A true equilibrium would thus arguably require a greater water supply at any given water price (or prices higher at any given supply). We however have no data on the exact severity of rationing in the system today.

With these qualifications, in order to derive the market clearing price we first need to determine whether this price corresponds to a short-run or a long-run equilibrium in the market**.** A "long-run equilibrium" will arise when demand outstrips the supply figures given in table 1, at the estimated LRMC price of 6.25 HNL/m3 (in fixed terms at current general price levels). At and above such demand levels, we will claim that the price charged of water users should be (in the neighborhood of) 6.25 HNL/m3.[18] A "short-run equilibrium" will arise when demand is less than supply at this price. The clearing prices, equalling demand and supply, are then given by the figures in table 7. The first and second alternatives represent the assumptions of "low" and "high" rates of coverage of piped water to households in Tegucigalpa, under the intermediate demand response assumption of table 6. In the two last columns, equivalent calculations are made under an assumption that demand responds linearly to increases in water prices, again using the demand response figures in table 6.

[18]Technically, this line of reasoning is not entirely accurate. The reason for this is that we have assumed that the loss rate in the system is reduced gradually and reaches 20 % only in 2010. The LMC of 6.25 corresponds to a loss rate of 20 %, and is technically accurate only in 2010 but not before. Higher loss rates in intermediate years imply higher prices corresponding to LMC in such years. We here disregard the (small) inaccuracies involved in our simplification.

These four scenarios give markedly different developments for the market clearing water price for households with piped water. In the three last cases the equilibrium price reaches LRMC within the time horizon, in years 2006, 2002 and 1999, respectively. Only in the first alternative is the clearing price for the entire period below LRMC.

On the basis of the discussion above, we will view alternatives 3 and 4 as the more realistic ones by which demand and supply will be evened out in the long run. This implies that the clearing price quickly will reach the LRMC of 6.25 HNL/m3. Such an argument is probably strengthened by the current heavy rationing of water to households with piped connections, who are willing to pay considerably (on the average about 50 HNL/month) for improved service.

The figures in table 7 (and perhaps most reasonably, the two right columns of the table) indicate the direction and magnitude of desired water pricing reform in the Tegucigalpa water system, from an allocational point of view.The direction of such a reform is unambiguous, namely toward higher household water prices. One may still argue that the desirable speed of a reform is more open to question. This is due to the uncertainty about the figures in the table itself, but more to political and social factors not directly embedded in the calculations. Politically speaking, a very rapid increase in water prices is probably both impossible and undesirable, for at least two reasons. First, it must imply a great increase in water costs, and consequently reducion in real disposable income, for those middle- and low-income households who are connected (and who hold much of the political, in particular voting, power). A rapid reform is thus likely to be greatly resisted by these. Secondly, water consumption is for many households today not metered at all or only imperfectly. If water pricing is to serve as an efficient resource allocation mechanism (and not only as a revenue collection mechanism), it is paramount that metering of individual household water consumption be possible. Consequently, a water pricing reform must go together with the installing of functioning water meters in all affected households, and with improvements in service that makes a higher water price more politically acceptable. Both these efforts are bound to take time.

Table 7: Scenarios regarding development of the market clearing water price for households in

Teguicgalpa. HNL/m3.

Year	Supply of water	Total household cons.	1. Eq. price, low cov., interm.	2. Eq. price, high cov., interm.	3. Eq. price, low cov., linear	4. Eq. price, high cov., linear
1997	40.1	30.8	1.3	1.3	2.0	2.3
1998	41.5	31.7	1.4	1,5	2.7	3.7
1999	42.9	32.1	1.5	1.9	3.5	6.25
2000	44.2	32.9	1.6	2.5	4.5	
2001	45.7	33.6	1.7	3.0	5.6	
2002	47.2	34.7	1.8	3.5	6.25	
2003	48.6	35.5	2.0	4.0		
2004	50.0	36.2	2.2	4.7		
2005	51.4	36.9	2.4	5.3		
2006	52.7	37.5	2.7	6.25		
2007	54.1	38.1	3.0			
2008	55.5	38.7	3.3			
2009	57.0	39.4	3.7			
2010	58.6	40.1	4.0			

3. Implications of low water prices in Tegucigalpa

3.1 Introduction

In this section we will discuss consequences of low water prices in Tegucigalpa, in a political economy perspective. In section 4 below we will study the incentives of (public and private) actors to change or retain the current water price regime, and their ability to actually affect this regime. Appropriately addressing such issues calls for a number of approaches beyond traditional economic analysis in terms of efficiency. First, the economic, political and social conditions giving rise to inefficiencies need to be

discussed and analyzed. Secondly, one needs an analysis of the underlying causes of inefficiency, such as to pave the path for more efficient management regimes. Thirdly, the analysis, and possible recommended policy changes, must to some extent take into consideration the relevant institutional constraints. This is however a subtle and complicated point. Institutional constraints should clearly not always be viewed as insurmountable hurdles blocking all possibilities of change. Recommendations of radical institutional changes are often what is needed to awaken policymakers and population to the idea that the current state can actually be improved upon.

3.2 Discussion of SANAA' s administration of the Tegucigalpa water system

The recent history of SANAA's management of the Tegucigalpa water system is not particularly bright. The coverage of piped water by SANAA to individual households has remained fairly constant since the 1970s, at between 50 and 60 %, and stood in 1995 at 53 % according to Walker et.al. (1996) (61 % according to Salgado Artica (1996), the figure we are using in most of our discussion). In addition, it appears that consumers with access to piped water are all (more or less) heavily rationed, by generally only having access to water a few hours per day.[19] Those without connections are heavily concentrated to the marginal barrios, and depend on public taps, private connections or private water vendors. All in all, less than 50 % of SANAA's water is accounted for in terms of the water being billed and paid for. Water is lost partly in the distribution system, partly to illegal connections, and partly through excess unregistred consumption among households without meters or whose meters are misread. System maintenance is poor, implying that a significant fraction of the water produced (27 % in our estimations) never reaches consumers.

The cost structure within SANAA is also clearly inefficient. For one thing, manpower costs per connection in Tegucigalpa are about twice the national average, without any obvious reason. In particular, there appears to be significant overstaffing of the SANAA central administration in Tegucigalpa, as well as related to the local operative functions. Walker et.al. (1996) estimate the number of employees within the total SANAA system (which covers a number of local municipalities in addition to Tegucigalpa) to be about three times the number necessary, to carry out the tasks currently performed

[19]It may perhaps be too strong to say that “all” consumers are rationed. Some spefic groups, living at the very lowest altitudes, may have sufficient water pressure to receive water all day. These are however exceptions, and do not change the general picture of overall water rationing.

by SANAA. One reason for the high staffing is explicit and implicit agreements between SANAA and unions, prohibiting multitasking and retaining a heavily bureaucratized and multi-layered central management structure. Moreover, alliances between the SANAA administration and the relevant local labor unions have generally implied that tariff increases have resulted in more or less equivalent increases in the amount of wages and salaries, partly through the employment of more workers, and partly through increasing salaries per worker.

As a result of high costs and low revenues, SANAA as a whole (and the Tegucigalpa system in particular) has been running a continuous deficit over the last 15 years. This is in spite of the fact that SANAA itself does not directly cover the costs related to investment projects in the water sector. Such costs, as well as SANAA's costs of electricity and chemicals, are borne directly by the central government, and imply a significant burden on the total government budget, on the order of 1-2 % of GDP for the entire water sector. In effect, SANAA is not financially responsible; its deficits are willingly (although not happily) absorbed by the central government. The continuous tendency toward overstaffing, in view of failing revenues, must also be understood in this light.

3.3 Historical water prices in Tegucigalpa

As already discussed above, the water price currently paid by water users (in particular by households) in Teguigalpa is low, only about 20-25 % of LMC. In Table 8 we describe the development of average real water prices to main groups of water users (households, and others), over the period of 1978-1997. The most remarkable feature of the table is the tendency for real water prices (in particuar to households) to be falling over the period. In 1995 there was made an effort to overhaul the water pricing system, with increased water prices (depicted in the table as the 1997 prices, which correspond to the tariff rates in table 3 above), in response to failing SANAA revenues. We however see that even after this hike, real water prices to households are still only little more than half the 1978 level. For other users, in particular commercial and industrial consumers, the increase was greater, and implied that the real price approached the 1978 level.

Table 8: Development of real prices of water in Tegucigalpa, 1978-1995. HNL/m3, 1978 prices

Type of user	1978	1983	1990	1995	1997
Households	0.38	0.32	0.25	0.15	0.21
Other	0.50	0.41	0.37	0.21	0.45
Total	0.42	0.35	0.29	0.17	0.29

Source: SANAA (1995).

While SANAA is a government agency, it has no direct control of its prices. These are set by a national pricing board (CNSSP). This board appears to set prices mainly on the basis of the political interests of the board members themselves and of their constituencies, but it generally needs the tacit approval of price hikes from the central government. These constituencies consists predominantly of reeelatively well-off individuals who already have access to running water, with reasonably good service. Their main immediate concern appears to be an as low a water price as is politically possible. One practical reason for falling real water prices then appears to be the general high inflation rates over this period, and resistance and reluctance against, water price hikes in line with general consumer price increases.

The most common official argument in favor of low water prices is that water is a basic necessity and that it should be made available to as many as possible, at an affordable cost.This would be a valid argument if all households had access to piped water. In practice, this argument is generally flawed. Going back to our table 2, we see that around 20 % of all households in Tegucigalpa have no access to piped water, and that another 20-30 % are served by other systems than SANAA. Generally, these belong to the poorest households, and those with no service whatsoever are likely to be at the bottom of the income distriution. Moreover, table 2 also reveals that those with no service pay water prices per m3 that are perhaps 20-30 times the prices paid by households with SANAA connections. As we will try to demonstrate below, low water prices charged of SANAA customers most likely contributes to making the overall allocation of water less equitable, than it might be with higher prices.

3.4 Political and economic consequences of low water prices

In this section we discuss the potential consequences of low water prices in the Tegucigalpa public water system. We split the discussion in three parts, namely 1) consequences for water supply in Tegucigalpa, and 2) consequences for the behavior of consumers and other private and public agents, and 3) other consequences, e.g. overall allocational, macroeconomic and social consequences.

3.4.1 Consequences for local water supply in Tegucigalpa

A) An immediate consequence of low water prices is low revenues for the water administration (SANAA). As noted SANAA is today not able to cover its variable costs through water tariffs. This has resulted in a minimization of activities on behalf of SANAA, beyond those required directly by law. It has however not resulted in a downsizing of SANAA staff, which has remained inefficiently high mainly due to strong union pressure against reforms, which in turn has been made possible by the central government's willingness to accept SANAA deficits. As already noted, the water sector in Honduras implies a drain on public funds, in the neighborhood of 1-2 % of GDP.

B) Low water prices makes it generally uninteresting for SANAA to extend coverage to new consumer groups.As already noted almost all of those without service today live in marginal barrios, many up the hillsides of Tegucigalpa where it is expensive to install connections and supply water. Since connection costs are generally required to be paid publicly, SANAA would in most cases lose money by extending service to these, given that it does not receive direct special funding for such service extensions (which it today does not). Such incentives hold back system expansion. Clearly, expansion would have been facilitated by higher water prices for SANAA consumers. As a result the fraction of consumers with public household piped water in Tegucigalpa has stood still over the last 20 years.[20]

C) Low water prices provide few incentives to collect water bills, or to control that water connections are legal. In Tegucigalpa many households (around 20-30 %) in any given year avoid paying their water bills entirely, without being prosecuted. This is also likely to imply a social equilibrium where avoiding payments is common and socially acceptable. For similar reasons, SANAA does not have incentives to control that water is not stolen from the system, through illicit connections. Above we have indicated that perhaps 20 % of Tegucigalpa's population has such illicit connections, without this being

[20]According to Walker et.al. (1996), the potential net welfare gains due to extending service to more households in Tegucigalpa are quite substantial. In their calculations, this net welfare gain may be several times the total current SANAA revenues.

investigated by the authorities.

D) Another problem related to the collection of water revenues is the lack of water metering, which is worsened by low water prices. Today hardly more than half of SANAA's household customers have effectively functioning water meters. Installing and reading water meters is costly and may not be profitable given low prices. Systematically incorrect (too low) reading of meters is also likely to be widespread (according to private informed sources; although no figures are availiable), whereby SANAA employees may receive kickbacks in return for underreporting, and SANAA itself losing revenues. A basic problem is that it may not be profitable for SANAA to investigate that misreading is going on, at the low water prices that can be charged. Another problem is the lack of financial responsibility of SANAA, which limits its interest in minimizing such revenue losses.

E) System maintenance and service are discouraged when water prices are low. This issue has at least three aspects. First, low revenues puts SANAA in a poor position with respect to what maintenance it actually can perform. Secondly, good maintenance, and making sure that maximum amounts of water reaches consumers, is less profitable for SANAA the lower are water prices and the less metering there is of produced water (which may in turn be adversely affected by low water prices). Note in this respect that an estimated 27 % of all water produced is lost due to poorly maintained pipes; and that little maintenance of pipes has been conducted over the last years.Thirdly, SANAA may feel it can afford to offer less efficient service to its customers when the price these pay for the service (the water price) is low. E.g., low water prices makes it harder for consumers to complain about inferior service.[21]

F) Incentives for expanding old or opening up new water sources may be discouraged by low prices. In particular, at current water prices new expansion projects are likely to appear as economically inefficient and prohibitively expensive, and financially out of reach for the local or national water administration in the absence of massive external subsidies to the domestic water sector.

G) The specific consequences for La Tigra National Park (LTNP) need mention. Low water prices serve to limit the incentives for maintaining and possibly expanding the water supply from the park.This is due to two separate effects. First, the water administration’s incentives to care for the park and its resources

[21]Note again that the willingness to pay among consumers, for improvements in service, is considerable, according to Walker et.al. (1996) on the average about 40-50 HNL/month among regular SANAA clients. These are amounts comparable to the current water expenditures by these households today. Thus there are great potentials for welfare gains by improving service, even for those who are already served today.

are reduced, since more water brought out from the park is sessentially worthless to this administration. Accordingly, today SANAA maintains a bare-minimum activity level with respect to the water flow systems from LTNP, and there is no activity whatsover for general park protection. Secondly, the legally designated caretaker for the park, Amitigra, has incentives to care for the park but lacks the financial resources to perform such a task effectively and efficiently. The only practical way to provide secure financing of Amitigra operations is through a surcharge on water brought out from the park.[22] At today's water prices there is in practice no room for such a surcharge; at least there is no political will to enact it. An increase in the average household water price, to, say, 3 HNL/m3, would make a surcharge requred to finance necessary Amitigra operations possible, and perhaps politically feasible (in my estimation this surcharge would have te be approximately 0.5 HNL per m3 of LTNP water produced, at current production rates).

3.4.2 Consequences for private agent behavior

A) The most immediate and obvious consequence of low water prices for water consumers is inefficent overuse of water among those consumers who face low marginal water prices, and who are not severely rationed. As noted above, average annual household water consumption in Tegucigalpa is around 350 m3 for those with regular SANAA connections. According to the demand responses depicted in table 10 above, average household demand is likely to be reduced by perhaps one third (to 200-250 m3 per year) by an increase in marginal water price up to LRMC. Water consumption in excess of this level is used inefficiently in the sense that the social value of the water to the public is lower than the cost of providing this water.

B) As noted low water prices go together with poor service, in particular in the sense that water is supplied only during parts of the day (for many, 4 hours per day), and at poor pressure. A rational response by consumers is to attempt to improve their own service level by private means. For regular SANAA customers this is done by installing private sisterns which are filled during hours with supply, and tapped at other times of the day. Such installment is costly, and the investments in such sisterns are a social waste when the alternative is a regular 24 hour water supply.

C) The fact that regular service is not extended to all households has a number of incentive effects in the

[22]This is argued forcefully in my consultancy reprort, Strand (1998).

private market for water not provided by SANAA. There is considerable incentive to extract water illegally from the SANAA system; this water is much more valuable to such users than it is to SANAA. Illegal extraction is done both for direct service to households (possibly up to 20 % of these), and for resale to households without service.

D) A special water market is created for those households with no piped water service whatsoever. In this market the allocation is particularly inefficient; water is brought, is a very costly way, to consumers by trucks and sold directly "by the bucket" at high prices (perhaps 25-30 times SANAA prices; see table 5 above). These prices largely reflect the costs of supplying water in such a fashion. Most of the cost difference (when one to the relevant SANAA water prices adds amortized connection costs) is thus a direct social waste.

3.4.3 Other overall economic and social consequences

A) As noted low water prices have immediate income distribution consequences. Those with regular SANAA connections (in particular those with good service) are favored, and those without such service are disfavored. Since the former generally have higher incomes than the latter, income distribution effects are generally adverse, possibly grossly so. Walker et.al. (1996) indicate that the poorest groups of households, with no regular service, may spend as much as 10-15 % of gross household income on water, and even then obtain very little of it. Those who are connected are however in a majority, and overwhelmingly so among individuals who vote or control other political resources. Note that the current system of water charges implies that households with very high consumption (presumably the richest) pay relatively higher water prices. This contributes to some evening of incomes among those who enjoy SANAA service. The effect is however likely to be small, since water costs are after all a small fraction of total expenditure among wealthy households, and since such households are relatively few (implying that the total effect on SANAA revenues is small).

B) The main immediate macroeconomic consequence of low water prices is its implication for public sector deficits. As noted the water sector in Honduras implies a drain on public funds in the neighborhood of 1-2 % of GDP. Over time this must have at least one out of three possible consequences, namely a) similar amounts of government revenues must be raised in other ways, b) public expenditures must be reduced, or c) the government debt burden must increase. Since the two former options are politically unpalateable, the third option is the most likely outcome, for the short and medium

run. Great public deficits may however have serious long-run consequences for Honduran macroeconomic policy. In particular, Honduras has for longer periods been under suspension by the IMF for failure to fulfill government deficit targets, which are certainly much more difficult to fulfill with a great water sector deficit. In such a situation the climate for potential foreign investors becomes uncertain, and recently direct foreign investment in Honduras has been close to zero. This could in part possibly be attributed to the uncertainty created by current water sector policies, and the difficulties this has made for the implementation of favorable agreements with the IMF and with the World Bank and the Inter-American Development Bank (IADB) (hereafter the Banks).

C) Strategic interactions with international lending and donor institutions, in particular the Banks, also appear to be an important aspect of water price setting in Tegucigalpa. In the current situation most of the major investments in the water sector in Honduras, in particular those in new water projects, are financed by the Banks, largely on a concessional basis.The apparent need for such financing is made more visible and plausible by the observation that the water sector in Honduras (and in particular Tegucigalpa) runs large deficits. Provided that the Banks take the water pricing system in Tegucigalpa as given, they will at the same time take as given that there are small possibilities for domestic financing of large new water projects. It may then appear rational to opt for a "bailout" of the Honduran government, since the apparent alternative is no action at all. Such bailouts, and the Honduran government's anticipation that they will occur, makes it less advantageous for this government to raise water prices and thereby potentially make room for greater domestic financing of such investments. In game theoretic terms, and viewing the Honduran government as a Stackelberg leader (by setting water prices) in the game against the Banks (who decide on water sector financing), setting low water prices and thereby attracting Bank financing may constitute a subgame perfect equilibrium in the sequential game between the two. In such a game, Bank follower behavior has the consequence of distorting domestic incentives in the direction of setting low water prices. While such Bank behavior may be rational when Banks take water prices as given, it may result in an overall inefficient solution, with all the inefficiencies following from low water pricesdiscussed in subsections 3.4.1-3.4.2 above, which are then cemented by financing strategies of the Banks. Efficiency may require Bank leadership in the game, e.g. in the form that the domestic Honduran water pricing strategy be conditional on Bank financing. We will come back to this point in section 4 below.

D) The particular consequences for LTNP need mention. As noted these are of two types, namely to reduce the water administration’s (SANAA’s) incentives to care for the park and its resource, and to

reduce the possilibities for funding of park protection activities. The main active party interested in and practically responsible for protection of the park, Fundación Amitigra (FA), would be relatively powerless in its protection efforts in the absence of government funding, which in practice must come out of a water surcharge on the water produced from LTNP. Such a surcharge is in turn difficult to envisage in the absence of higher general water prices in Tegucigalpa.

E) There are also possible effects of low water prices for the feasibility of overall water sector reform. With basis in the current situation in Tegucigalpa, with endemic deficits in the water administration, the municipality has been very reluctant to make a move to take over management of the water system, apparently out of fear that this would imply an extra burden on local government budgets.[23] A change in pricing regime is certainly necessary in order to provide such incentives.

F) There are important possible consequences in terms of public health and population development. The poor public health situation for those with no access to running water is well known. Among such groups the prevalence of infectious diseases and the rate of infant mortality way exeed levels for the rest of the population. Extending piped potable water service to such groups is practically possible only together with price reform. This makes water sector reform close to the most efficient public health undertaking conceivable, in a country such as Honduras.

G) Migration is also likely to be affected by water prices and coverage. In Honduras inter-regional migration is essentially free. Currently, thousands of settlers establish annually at the outskirts of Tegucigalpa, most of them in the marginal barrios. Low coverage of piped water to these clearly serves to discourage migration into the city, since most new settlers are forced to settle in sections of the city with the poorest water coverage, and where obtaining water consequently is expensive. Low water prices facing those with access to piped water has the opposite effect on migration. This indicates that a water reform, whereby water prices are raised and coverage rates increased, would in general have an ambiguous effect on migration. Most likely, the effect from higher coverage will dominate, due to the extremely high water costs for those with no direct water access. Thus a water price reform should tend to increase migration into the city. This may be undesirable as viewed from the city of Tegucigalpa, but

[23] An additional or complementary explanation has been offered to the authour by Ian Walker, in private conversation. This has to do with the potential political risks to the municipal government administration of taking the system over, and possibly raising water prices. The latter may be politically unattractive unless it is accompanied by significant improvement in service and water coverage rates. The latter may appear as more difficult ways of attracting voters, than simply maintaining the situation as it is. Given a status quo, there is of course no incentive to take the system over.

not necessarily for society as a whole. The total effects of such increased migration are complex, and of course not all positive. But one should not neglect the possibility that increased urbanization could be an efficient mechanism for raising average living standards in a country such as Honduras. Many basic services, among them sanitation, electricity, water service and telephone connections (and even television coverage), are much cheaper to provide in urban areas than in the countryside. This is another side effect of a project to increase water coverage, which needs to be explored further in future studies. A full discussion of such issues is beyond the scope of this paper.

3.4.4 Some further (favorable) effects of low water prices

The effects of low water prices discussed so far in this section are on the whole negative. The only effect mentioned that one might argue to be positive, is the possible reduced migratory response effect in the previous paragraph. Other possible positive effects of high water prices should be included for completeness. Some of these have to do with the more extensive rent-seeking and corruption within the administrative body responsible for water revenue collection, that may follow from higher water prices. In the case of Tegucigalpa, significantly greater revenues for the water administration could clearly create room for more wasteful spending within and by the organization, e.g. in the form of higher salaries, more wasteful staffing, and other types of wasteful spending (on buildings, vehicles, equipment etc.). Higher water rates, together with more efficient metering of water, might also create greater incentives for corrupt behavior by meter readers, e.g. in the form of accepting bribes for underreporting water consumption. Also, the water administration's budget and expenses may be less thoroughly scrutinized by higher authorities when this administration is running a surplus, than when it runs a deficit. This could create additional opportunities for corruption among water sector managers. There may however be countervailing forces to these. The tendency to greater corruption at the various levels could in principle be counteracted by greater incentives for monitoring at the respective higher levels, when higher water prices imply that revenues from the water sector become more important for the government's overall finances. Also, it could lead to more pressure in the direction of transferring water management from the inefficient SANAA system, to a more efficient municipal or private organization. The net effect is thus far from clear from a theoretical point of view. Another basic problem is whether higher water prices actually translates into greater incentives for the water management to produce water for the population. If not, the main positive effect of higher water prices could well be a more efficient allocation of a given amount of water among consumers; while the increased supply effect could be small.

4. Equlibrium water prices and service in a political economy perspective

4.1 Introduction

We have in sections above attempted to document that the water prices actually used in Tegucigalpa are inefficiently low in a long-run perspective, and that water prices should be increased gradually over time, up to long-run marginal cost. An important question is then: what actually governs the setting of prices under institutional conditions similar to those experienced in Tegucigalpa? And what political possibilities exist, for actually changing the current price regime? This section will try to address such issues.

As already noted, water prices in Tegucigalpa are today, and have for a long time been, set by a national water pricing board, CNSSP. It is however way too simple to put all blame for failing water pricing policies on this board. First, the CNSSP is appointed by the government and influenced by a number of economic and political actors. Secondly, the issue of water pricing is deeply integrated into the larger issue of possible water sector reform in Honduras.

4.2 An analysis of stakeholders' incentives

Table 9 presents what we call a "stakeholder analysis" of the various major political and economic actors, related to water pricing in Tegucigalpa, and describes their interest in the issue, and their ability to force possible policy changes.[24] These actors are of three basic types, namely external (1-4), internal political and administrative (5-10) and other domestic actors (11-17).

It is clear that the two most important external actors, namely the Banks, hold key roles in this game. Both banks are strongly in favor of sectoral reform, and hold potential leverage in terms of already approved and future potential funding which is awaiting a reform process to be initiated. Other foreign actors, such as bilateral donors and lenders and international firms, also tend to be favorable of reform, but today have far less leverage with respect to their ability to influence the policies of the Honduran

[24] The table is, with a few modifications, adapted from Walker et.al. (1996), who make a similar analysis of incentives for general water sector reform in Honduras. I also refer to their work for a more thorough discussion of such issues, than what is allowed here.

government. We argued in section 3.4.3 above that the role of the Banks so far seems to have mainly been that of followers, providing financing in response to apparent needs by the Honduran government, and that this follower role may have had unfavorable consequences, in particular to set water prices inefficiently low. Thus a much more active role for the Banks is probably necessary, if water sector reforms are to be a reality.

Within the government, interests seem quite diverse. The issue of general sector reform has few direct supporters in the political and administrative apparatus of the central government. SANAA is strongly against, the president seems disinterested in the issue (as evidenced in the new presidential declaration on the water sector, which is basically without content and which has so far not been followed up on any of its points), and the ministries and Congress remain cool. The only central government actor which has come out in favor of reform is the Economic Cabinet, which is responsible for overall policies such as general resource allocation and budget balance, and realizes that Bank funding will be easier to obtain with reform than without. On the more specific issue of water pricing, SANAA has (naturally) come out in favor, and so has the Economic Cabinet. Other political actors are either resisting price increases directly or are silent on the issue.

Among other domestic actors, private households with access to water are currently reluctant to accept either reform or price increases. There is widespread fear that an independently run and less strictly controlled water administration may impose higher prices without improvements in service. Those with the greatest stakes in reform, namely those currently without access to piped water, are generally unorganized and today unable to express a collective opinion on the matter, and have low voting propensities. Note that the large majority of potential voters today have access to piped water. Water price increases would thus be politically unpopular and unlikely to win support from either the President, Congress or political parties.

Also the administration of the city of Tegucigalpa is currently sceptical to the isse of water sector reform, which would most likely imply that the city take over managing the water aquaducts and distribution system.The city is reluctant to do this, for at least two reasons. First, it feels that it lacks the manpower and expertise to run the water system efficiently. Secondly, it is scared by SANAA's economic performance in Tegucigalpa, and is afraid that managing the water system may lead to a drain on city budgets instead of being a potential net source of income.

Table 9: Stakeholder analysis of incentives to promote water pricing reform in Tegucigalpa

Actor/group	Interest in issue	Current position	Resources available
1. World Bank	Promotes sectoral reform	Strong support	Basic loan financing; 30 mill USD strucutral adjuustment financing
2. IADB	Promotes sectoral reform	Strong support	Investment loans to sector; 35 mill USD strucutral adjustment financing
3. International firms	Possible management, concession and consultancy contracts	Support	Possible TA to assist reform
4. Bilateral lenders	Finance to sector	Varied positions	Financial resources, TA
5. SANAA	Interest in remaining in power of water administration	Strong opposition to general reform, favors price increases	Technical and informational capacity, tacit support from government
6. President	Responsible for relationship with Banks, and for domiestic issues	No apparent interest in issue	Executive power, but cannot directly block Congress decisions
7. Economic cabinet	Interest in balance of payments improvements, infra-structure efficiency	Leaning toward support	Ability to influence president
8. Ministries	Responsible for sectoral developments	No strong declared positions	Various political and adminstrative influencies

9. CNSSP	Existing tariff regulator	Strongly opposed	Ability to question proposals, influence with president
10. Congress	Overall legislation, resource use	No declared position	Legislative power, can block reform
11. Municipality	May take over administration from SANAA	Disinterested	Lobbying power, could block reform
12. SANAA union	May lose jobs, corruption possibilities	Strong opposition	Lobbying power
13. FA	Caretaker for LTNP	Strongly in favor	Small direct power
14. Public users of SANAA system	May face higher water prices, but improved service	No clear public opinion, but scepticism	Political/voting power
15. Households without access to SANAA system	Unable to get piped water today; interest in better service	No expressed opinion	Small
16. Domestic private industry	Fear increased tariffs; contract opportunities	No clear expressed opinion	Lobbying power
17. Political parties	Popularity gains/losses	No clear opinion	Influence on Congress

4.3 Possible actions required for water pricing reform

A consequence of the situation described above is that there are today few organized efforts being made, from interested parties outside of the government, to challenge the current pricing and administrative regime in the water sector in Tegucigapa. When in addition key actors such as the President and Congress are generally indifferent toward the issue, there are no strong unified forces from within the country, working in favor of reform.

In this light a key role is given to the Banks, who have both economic leverage and a great interest in

sectoral reform. This role is enhanced by factors emphasized under point C in subsection 3.4.3 above, where it was stressed that Banks so far mainly have played a follower role, by rather passively providing sector financing and taking domestic sector policy as given. In particular, the Banks have so far not gone ahead to push strongly for pricing and sectoral reform. A reason for this reluctance to act appears to be that strong demands for reform are viewed as politically questionable, and perhaps outright inappropriate, when they cannot at the same time be backed up by broad domestic support.[25]

It thus appears that a requirement for changes in the Honduran water pricing system is more direct Bank pressure. It is however obvious that the Banks must be very careful in applying such pressure. As should be seen from the "stakeholder analysis" above, a key to favorable policy changes is the ability to create a unified interest in reform among several important domestic political actors. Since the part of the public that already has access to piped water is perhaps the key political actor (since these are the most outspoken and economically resourceful and hold a large majority of voting power), it is important that a water sector price reform be introduced very gradually, and be accompanied by e.g. improvements in service that compensate most of these households for the price increases. Also, water prices should not be increased substantially without at the same time making sure that meters are installed (and properly read) in all (or a much larger fraction of) households. It may be preferable to leave meter installing and monitoring to outside contractors, as has already successfully been done elsewhere, such as in Santiago, Chile.

Effective water metering and reading of meters could create the possibility for efficient marginal pricing of water without large increases in household water expenditures, at least in an initial phase of a reform. The reason is that inframarginal consumption units could be priced lower than marginal ones, which could allow some of the benefits of pricing reform to be harvested (in particular, reducing public overuse of water and increasing the marginal value of water for the water administration) without creating immediate public resistance against the reforms. This however has the disadvantage that water administration revenues may not increase by much, creating the problems associated with failing revenues that were noted in section 3 above. Given that the consequences of the reform are positive for

[25]Behind this is a recognition that the Banks (in particular the World Bank) have several roles to play, in addition to the role stressed the most here, namely that of promoting allocational improvements in the countries to which they lend. Among such roles are that of consensus builder among politically important domestic actors, and that of guarding, and itself respecting, national sovereignty. In particular, the Banks must be very careful when threading into politically sensitive territory, in which Bank policies clash strongly with those of the borrowing countries' political leadership. Kreuger (1998), in her discussion of IMF and World Bank policies, takes up such issues. She points out that some of the failures of World Bank projects have laid the World Bank open to attack and possible discredit, by critics and ultimately by Bank funding countries.

the average consumer, however, over time a political consensus in favor of gradually increasing water prices could be built. In order to establish such a consensus, it is paramount that the public be informed, and convinced, in a systematic and comprehensive way, about the positive relationship between increasing water prices and better service.

I have less to say at this point about the exact political mechanism by which a popular consensus in favor of increased water prices can be translated into political action to increase these prices. As it seems now, one necessary ingredient of such a mechanism seems to be some sort of pressure for change by the Banks. It is also clear that the task of implementing price reform will be virtually impossible without wide popular support for reform. In any case, the Banks will hold key roles in this picture.

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