

Creative Inter-Sectoral Partnering for Urban Water Supply Systems in Developing Countries  
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#### Abstract

Broader recognition of the social and economic values of drinking water can harness the private sector's experience and financial resources to tackle the dilemma of urban water supply systems in developing countries. However, smaller cities are unlikely to attract large amounts of private capital in the near term due to high demand for the few international private firms. Arrangements such as amalgamations are a viable alternative to a city-by-city approach, but they will not be able to address the majority of urban centers' needs. Other alternatives need to be developed. One consideration is to expand the parameters of public-private partnering and explore linkages between de-centralized community service providers and centralized municipal water supply systems. However, successful hybrid systems will arise only if financing opportunities are made available to small enterprises and community groups. Some agencies are poised to launch innovative financing mechanisms for such actors, and formal lending agencies should give such initiatives serious consideration. They may be the best chance for meeting the needs of the poor in the near future. In addition, it behooves agencies interested in public-private partnerships as a means of addressing urban development to see small private operators as an opportunity for expanding local capacity and increasing domestic private sector involvement in urban infrastructure.

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## QUESTIONS TO BE ANSWERED

This paper explores questions related to two frontiers of private sector participation in the delivery of urban water supply services in developing countries.

### 1) Private involvement in smaller cities;

What are some examples of smaller cities where the private sector plays a significant role in improving service provision?

What are the types of contracts involved? Do arrangements exist that involve substantial amounts of private capital, such as in concession contracts, or is involvement in smaller cities confined to limited capital investment as in operations and management contracts?

What alternatives are being explored? Is it necessary to amalgamate smaller municipalities in order to increase their attractiveness to private investors?

### 2) The role of "informal" service providers and "non-traditional" private actors;

What alternative structures have been used and in what circumstances are they likely to succeed?

How should the traditional spectrum of structures for private involvement in water services be modified to reflect them?

## SUMMARY OF FINDINGS

The driving force behind increased private sector involvement in water supply services lies in the fact that demand has outstripped governments' abilities to meet the needs of expanding mega-city populations. Broader recognition of the social and economic values of drinking water can harness the private sector's experience and financial resources to tackle this dilemma. However, smaller cities are unlikely to attract large amounts of private capital in the near term due to high demand for the services of the few international private firms. Amalgamating dispersed smaller cities under a single contract is considered a viable alternative to a city-by-city approach, but such arrangements may prove to be too little too late. Other alternatives need to be developed. One consideration is to expand the parameters of public-private partnering and explore linkages between community service providers and formal municipal water supply systems, whether publicly or privately owned and operated. However, successful hybrid systems will arise only if financing opportunities are made available to small enterprises and community groups. Some agencies are poised to launch innovative financing mechanisms for such actors. Formal lending agencies should give such initiatives serious consideration, as they may be the best chance for meeting the needs of the poor in the near future. In addition, it behooves agencies interested in public-private partnerships as a means of addressing urban development to see small private operators as agents for expanding local capacity and increasing domestic private sector involvement in urban infrastructure.

## RESEARCH METHODS AND SOURCES

Most of the following research was accomplished using the Internet as a primary facilitator for information collection. Library searches yielded important background information on the water sector and urban needs, but there are few published studies on the topics this paper examines. The Internet, on the other hand, provides an excellent starting point for making contacts and gathering the latest case study data. Several references cited in the appendix of this report were downloaded from Home Pages of various institutions. Other documents were downloaded from attached files sent via e-mail from contacts derived from World Wide Web searches. However, the problem with e-mail is that very often the experts on the other end do not have time to respond to all of the requests spawned by the facility of electronic mail.

This study owes its biggest debt of gratitude to IRC The International Water Supply and Sanitation Centre of the Netherlands, and in particular to Madeleen Wegelin-Schuringa. Not only was Ms. Wegelin-Schuringa responsive to my inquiries, but the materials she provided were an indispensable resource which are cited heavily in the body of this study. IRC is also part of a network, Interwater, which has a one-stop-shop on the Internet for names of experts in different fields connected to the water sector. The UNDP Public-Private Partnerships (PPP) Program offered another useful Internet resource. From March to May 1998, the PPP program together with Yale University sponsored an Internet Conference on a search for best practices in urban water supply systems in developing countries which brought together experts from around the world. The survey of practices contained in this report will hopefully be a useful complement to the soon-to-be-published proceedings of that conference. Given the prominence of the Internet's role, the PPP program may wish to consider enhancing its own Web Site by providing a one-stop-shop for urban environmental infrastructure resources.

## DETAILED DESCRIPTION OF FINDINGS

### SECTION I The urban water supply scenario and private involvement

During the International Drinking Water Decade of the 1980s, the world's urban centers experienced significant expansion of their water sector infrastructure. The absolute number of urban dwellers who gained access to clean drinking water during this period increased overall, thanks in large part to \$100 billion in new investments. However, the exponential rise in urban populations during the same period offset these gains, and by 1994 more than 220 million, or 13 percent of the developing world's urban population, still did not have access to clean drinking water (World Resources 1997).

Urban water supply systems, therefore, have an enormous task ahead of them in providing basic drinking water services to expanding populations. Keeping up with growth, though, is not the only challenge. In addition, there is pervasive dissatisfaction with the level of service currently provided by state-owned public enterprises (Rivera 1996). Not only are services rarely available to new urban immigrants, but existing networks are rife with leaks. "Unaccounted-for-water", commonly the result of leaks from poorly maintained pipes and connections, can be as high as 45% in some cities (ADB 1997).

Many developing countries are exploring innovative options for increasing overall drinking water coverage, as well as economic efficiency and cost recovery. The trend in these countries is to view water as an economic as well as a social good: one capable of paying for itself in a demand-driven market. The trend can support increased participation of the private sector. Twenty-four out of fifty water utilities surveyed by the Asian Development Bank in 1997 involved some form of private sector participation in urban water supply systems (ADB 1997).

The push for increased private involvement in the water sector stems from the limited capacity of the public sector to meet expanding demand. Current investment in the water sector already totals \$25 billion to \$30 billion, an amount that is still well below required levels (Economist 1998), even if existing infrastructure was managed efficiently. But it tends not to be well managed. In fact, water utilities in developing countries have been described as "bureaucratic, inefficient and corrupt", with as many as five times the number of employees per 1,000 connections in developing countries as in Europe (Economist 1998). In addition, large amounts of water are lost due to leaks and over consumption.

Significant investments are required in order to improve and expand these failing services and facilities. For the most part, private sector involvement (especially for long-term leases and concessions) has focused on national capitals and mega-cities. There are several political, social and financial reasons why this is the case, including the fact that international competition is restricted by the few multinationals that dominate the international water sector, most of which are unwilling to invest in towns and small cities at this point. Demand for investment is high enough from national capitals that these firms can choose from any of a number of relatively risk benign urban markets.

The argument that secondary cities are too large for the kind of user management found in small towns and rural areas, and that they are too small and too numerous to be privatized is compelling (Braadbaart et al. 1998). Indeed, searches for best practices in smaller cities have so far yielded poor results. With the exception of a few cases where municipalities are bundled into a single contract (as in the Philippines, Mozambique, possibly South Africa, and Bolivia) or under unique circumstances influenced by a unique consumer base (as in Cancun, Mexico), secondary cities are mainly getting left out.

This report therefore provides a survey of arrangements and structures in the water sector of developing countries that might be considered as alternatives to traditional privatization. The final proposal presented in this study recommends experimenting with hybrid systems in cities where major financing barriers cannot be overcome. In such cases, informal community-based service providers can physically tie into existing structures in a self-reliant manner that will not require substantial government expenditures.

Although the scope of the paper limits discussion to non-traditional structures for private sector investment, including consideration of the roles of civil society, community-based cooperatives and NGOs, it acknowledges that future performance indicators must measure success by quantifiable gains in public access to safe drinking water, especially the poor. Regardless of who provides the system that ultimately reaches the citizens of an urban population, fairness and equity are essential for sustainable development. Therefore, implicit in the following presentation of alternatives is the underlying need to retain government involvement in the sector as a backstop to private sector influence, even if a new role is simply as an "arms-length" regulating agency acting on behalf of citizens and investors.

### Traditional models for private sector involvement in the water sector

The literature on private sector involvement in urban water supply offers numerous useful summaries of the range of structures available for governments to consider (Gentry et al. 1997; Franceys 1997; Haarmeyer et al. 1997; Lee et al. 1997; United Nations 1997). Private sector participation ranges from short-term, service-based contracts, which tend to be more prevalent because they are more risk-neutral, to the sale of all assets to a private firm. The following list is derived from various sources (especially Gentry, et al. 1997) and provides a spectrum of options for private sector participation.

**Informal cooperation and joint planning:** Residents, government officials and representatives of business leaders work together to develop solutions to urban problems and needs.

**De-centralized, "informal" private providers:** community-based investors, managers and operators work with NGOs and public utilities to improve access to drinking water in neglected neighborhoods left off the municipal grid. Informal participants can refer to unregistered individuals, families, community groups, NGOs and small enterprises (Habitat 1997)

**Design and construction contracts:** A municipality contracts out to private companies (domestic and international) the construction of facilities.

**"Petite privatization" or "Affermage" (also referred to as the "French model"):** The city retains ownership of the infrastructure and responsibility for capital investment, financing, regulation and tariffs; while a private operator assumes responsibility for operation and maintenance, quality of service and billing and collection (Rivera 1996)). The duration of these arrangements tend to be from 5 to 15 years (Franceys 1997).

**Public-private partnerships:** The government acts as sole regulator, but also owns shares in an operating company together with private shareholders. The arrangement is based on commercial principles, with more or less complete autonomy and allows the public sector to act more flexibly by earning profits for re-investment (Lee 1997). This type of arrangement can be found in Cote d'Ivoire.

**"Grande privatization":** There are two forms of private sector participation at this level. One is the model of Build-Operate-Transfer (BOT), in which the private company completes a new segment of the water system, usually requiring substantial sunk investments, manages it over time and then turns it over to the public sector. The second model is a Concession contract in which the concessionaire assumes responsibility for operating and maintaining and providing new investments in the system, but ownership of the assets remains with the government (Franceys 1997). These arrangements tend to be longer-term, as sunk costs will amortize over an extended period of time.

**Full privatization:** The government sells off all infrastructure assets and maintains a role as regulator. This arrangement is most commonly associated with the England and Wales privatization.

Although these arrangements are not described in detail here, they are provided as a reference in order to frame the following discussion on constraints to private sector investment in smaller cities and the description of "non-traditional" approaches that follows.

## SECTION II The question of private involvement in smaller cities

### The special problems of smaller cities

The prevailing wisdom among experts on the water sector in developing countries is that private involvement offers the best hope for rescuing struggling drinking water supply systems in the mega-cities. Given the scale of the technical task and the amount of capital required to upgrade existing systems, this wisdom appears to be sound. Experts also suggest that participatory systems involving consumers are the best solution in rural areas. However, the dialogue concerning mega-cities and rural areas ignores the huge populations in "secondary cities", provincial capitals and large towns where populations of up to half a million people live. Although when aggregated these cities represent a high proportion of developing country populations (see Table 1), they are considered by the private sector to be too small and too dispersed on a city-by-city basis to make good investments. By the same token, they are too large to be managed effectively by users (Braadbaart et al. 1998).

EMBED Excel.Chart.8 \s

Source: Blokland et al. 1998

For private operators, there are a number of important variables that make smaller cities on their own unattractive investments:

Size of the consumer base;

Municipal financing and solvency;

High transaction costs;

Lack of skilled personnel;

Even poorer infrastructure than in the capitals, requiring higher investment levels per capita;

Weak capacity as regulators and lack of negotiating experience;

So far, only a small number of large, flagship water projects in the developing world have been successfully undertaken. They cover the major arrangements: privatization, concessions, BOT projects. To date the most robust examples of private sector involvement have been limited to a small number of projects in major capitals, such as Buenos Aires and Manila, and in most cases central governments played a key role by providing guarantees of water purchase obligations or tariff structures (Robert Shanks, Internet Conference).

Guarantees provide an important backbone for the financing required to undertake major water sector improvements, but smaller cities have an underprivileged status when it comes to obtaining government-backed guarantees. The trend towards de-centralization may empower provincial political structures, but it can hamstring their ability to attract international financing. The World Bank, for instance, requires guarantees backed by the central government for most of their infrastructure loans. Municipal agencies responsible for water supply and sanitation provision may not enjoy the status of national institutions eligible for sovereign guarantees (Walker 1993).

Capturing economies of scale is a major concern for private operators. The larger the consumer base and the higher the willingness-to-pay, the more attractive a municipal contract will appear. In general, urban water supply and waste water projects requiring less than \$50 million will not be attractive to most international financiers (Walker 1993). The high investment expectations derive from the significant organizational and management costs of putting together a BOT/BOO project.

On the transaction side, administrative costs for smaller cities will spread across a smaller consumer base, rendering higher per capita costs for investing in them. In addition, government officials of cities outside the national capitals tend to have less experience with negotiating infrastructure projects with the private sector (Mody et al 1997). This creates an imbalance when structuring arrangements - one that can carry over into implementation and influence a municipal government's ability to regulate their more sophisticated private sector counterpart. For management, private sector companies will have a much smaller human resource base from which to draw skilled personnel.

When viewed in the context of the number of mega-city water and sanitation projects that will be considered in the near future, and the paucity of international water supply firms, it seems unrealistic to expect private sector investment on the scale required for smaller cities in the near future. A manager at one of Europe's largest water firms remarked that for the large multinationals, operations and management contracts may be the only types of arrangements that will receive widespread consideration on a city-by-city basis, as these arrangements are not overly risky. Fear that the

municipality will default on its obligations - or even go bust - figure prominently in the private firms' calculus (Robson, personal communication).

It is interesting to note a few exceptional cases where non mega-cities have captured substantial private sector investment for their water supply systems. Cancun, Mexico is one example. In just a few short years, Cancun has grown from a small municipality surrounded by rural farmers to a thriving tourist hub that hosts two million visitors every year. One-third of the total national tourist revenues stem from activities in and around Cancun. For private investors, the twin towns of Cancun and Isla de Mujeres offered a relatively secure 30-year concession. The investment is backed by the expectation that tourist volumes will ensure a steady cash flow from private hotels which, especially in Mexico, have a high willingness-to-pay for treated drinking water.

The Eastwater contract in Thailand is another exceptional case. Private investment there meets the needs of an industrialized region with a high demand for water services. again, the ability to pay and reliable customers increase the security of the investment.

#### Private Sector Options for smaller cities

If smaller urban centers are unlikely to attract large streams of private capital on their own what options are available to them for meeting their ever-increasing infrastructure, health and development needs? Most expert opinion suggests that the best approach will involve amalgamating municipalities in a manner that would allow a single contract to cover more than one urban center. In other words, governments can reduce the overall number of municipal water supply systems in a region by combining several of them into a single investment opportunity that financiers would consider worthwhile. "If a contractor can spread the costs of capital and overhead across operations in several cities and thus achieve economies of scale, the opportunities are more attractive than in serving a single municipality" (Walker, 1993).

Examples of such arrangements for contracts other than operations and management services are rare in developing countries. In addition to the Mozambique program, discussed below, the Philippines and Brazil are countries most likely to develop amalgamated water supply projects, but it is too early to compile extensive information on these efforts at this point. When projects do come on line, these countries will have to face predicted tensions associated with getting municipalities to work together (van Vugt, Internet Conference).

#### Five Cities Project, Mozambique

The average per capita income of Mozambique's estimated 16 million inhabitants is US\$90 (1994), making it one of the poorest countries in the world. A crippling 20-year civil war that did not end until democratic elections in 1994 led to significant economic disintegration resulting in extremely poor coverage of water and sanitation infrastructure. According to World Bank estimates, only 30 to 35% of the population has convenient access to safe drinking water. The national government set up a new framework for water supply and water resources management under a national policy document signed recently. This will improve the institutional framework for the delivery of urban water related services and increase the role of the private sector in the management of assets and the implementation of investments.

One initiative undertaken by the government, with assistance from the World Bank, is a National Water Development Project, one component of which involves the private sector in providing water supply services to five cities. The total project costs will amount to US\$56.9 million, of which \$36.0 million will be financed with an IDA credit and the rest co-financed by the government.

This project has just entered the pre-qualification stage, and bidding is not expected to begin until July 1998. At present there is very little public information available about the five separate contracts, including a 15-year affermage contract for Maputo and 5-year management contracts (with performance incentives) for four other cities: Beira, Nampula, Pemba and Quelimane. Although the contracts for the secondary cities reflect more conservative private sector participation than the arrangement for the Capital, the contracts are "bundled" in the sense that prospective bidders must bid for all five at once.

#### Under the proposed arrangements for the contracts:

construction of all major facilities will be carried out under the direction of the private operator;  
DNA (the national water authority) will be responsible for planning and coordinating;  
Private operators will be accountable to the government for cost-effective service provision;  
DNA will develop a new role in regulating and monitoring the private operator;  
Local communities will be consulted for input into the design of the water systems.

In addition, apparently to provide water supply services to the poorer neighborhoods, water will be supplied to households as well as to community taps.

Sources: Agnieszka Grudzinska, personal communication; World Bank WAIS Internet Document Retrieval

An alternative to amalgamating might lie in the Dutch model of publicly-owned, commercially managed Private Limited Companies. This type of approach combines the benefits of consumer participation and for-profit management with the security of ownership by the public sector, which remains the sole shareholder (Braadbaart et al. 1997).

First of all, the public-owned private limited company (PLC) is strongly associated with the Dutch water supply model and differs from the delegated private management of the French approach in a couple of ways. It refers to a mode of organization "where both the utility's infrastructure and the shares of the water company are owned by local and provincial government representatives, while the operator is a PLC, that is, an autonomous for-profit organization falling under commercial law" (Braadbaart et al. 1997). The difference between this approach and a standard operation and management contract is that the water utility is commercialized and has local and provincial government as majority shareholders. Under the PLC structure, consumers have a direct say in strategic decisions, and the publicly-owned companies receive no subsidies: they rely on consumers and commercial banks for their financial operations.

There are several reasons why the "Dutch" or PLC model should be examined more closely so that modifications can be made for developing countries. The principle reason is that the needs of secondary urban centers are not likely to be met adequately by the private sector in the near future. The PLC is a good compromise, although the amount of funds required for upgrading systems in poorly serviced cities may be too much of a burden for the public sector. With appropriate financing opportunities, however, these might be overcome. It may be an effective compromise for governments that think inviting foreign ownership of a water supply system under British-based or French-based structures is too big a step.

Significant modifications of the public water PLC are called for prior to applying it as a model in developing countries. For one thing, few countries in the world, including industrialized nations, have social standards comparable to the Dutch where the PLC system works. The Dutch willingness-to-pay is high for taxes and tariffs, and incomes are relatively high. The Netherlands is also culturally homogenous compared to most developing countries and has a long track record of managing water resource efficiently. Finally, the commercialized utility companies have much readier access to capital than their impoverished public sector counterparts in developing countries.



### SECTION III THE QUESTION OF NON-TRADITIONAL PRIVATE ACTORS

#### Types of community-based water supply initiatives

Discussions of water supply systems usually consider three key players: the public sector, the private sector and the consumer. The following discussion focuses on the role of the consumer and explores consumer participation in providing water services in places where it is otherwise lacking. Several consumer-run initiatives have begun to operate according to private sector rules by pricing water, managing cash flow and re-investing revenues. As a result, the discussion blurs the lines to some extent between the three key actors in the sector, focusing rather on unique and non-traditional forms of partnering.

#### Why the need for community-based initiatives?

The impact of growing urban populations in developing countries is reflected in sprawling low-income neighborhoods, slums and peri-urban areas rather than in swank new downtown office buildings. Unplanned communities, usually characterized by congested make-shift homes in outlying areas, or on steep hillsides surrounding an urban core, are the teeming gateways for most immigrants who arrive in the city from the countryside. Most residents here are squatters on land they neither own nor, in some cases, pay for. Lack of tenure security in these settlements acts as a powerful disincentive to municipal infrastructure development and private investment. For political reasons, the public sector shies from providing services that will lead to permanent residential status for informal aggregations, and risk-wary private sector operators are unlikely to invest in communities characterized by a dynamic and unpredictable consumer base.

Since financial and political risks stem the flow of capital and other forms of investment into some neighborhoods from the outside, consumers and community groups have to rely on their own human and financial resources.

#### Characteristic community-based structures :

In addition to the spectrum of traditional private sector options, The IRC International Water Supply and Sanitation Centre (IRC) in the Netherlands has compiled a list of "informal" water supply arrangements. The following list is not comprehensive, but it demonstrates the extent to which consumers are already involved in providing for their own drinking water needs. (Van Wijk 1997):

1) Public stand pipes These are usually provided by a municipality and do not necessarily involve a structured community organization. It is important to point out that public taps represent lower level of service and accountability and increased opportunities for water loss. From the standpoint of conservation and hygiene this is the lowest acceptable level, although roughly two-thirds of the fifty utilities surveyed by the Asian Development Bank in 1997 still have public tap service. An analysis of the survey results shows a correlation between good utilities (Singapore, Kuala Lumpur, Davao, Bangkok, and Port Vila) and the absence of public taps (ADB 1997).

2) Group taps: A yard connection jointly controlled by three to six households.

According to IRC these structures are important features of the water sectors of countries in Central America and Indonesia, where users form groups, register connections and share costs for usage. Community organizers are recommended to guide group formation and decision making.

3) Communal Water Point Service: Metered taps managed by a "tap committee" comprised of twenty to thirty households.

This is a larger collection of members, ranging from twenty to thirty households. The committee divides the water bill between user households, collects payments and manages revenues for re-investment in maintenance. This arrangement has met with success in the cities and towns of Malawi and was developed by the country's Urban Water Department in cooperation with IRC. (See Box 1)

#### Box 1

The Traditional Housing Areas in and around Malawi's urban centers typically lack basic urban amenities and infrastructure services. In 1981 the government launched a Communal Water Point Project in 50 urban centers to meet the needs of 24,000 low-income residents. However, by 1985 users had already ceased paying for the water point services due to management problems stemming from a lack of capacity building.

IRC assisted with a renewed national initiative to improve piped water supplies in urban areas in 1988, beginning with an analysis of shortcomings of the original structure. Results indicated that non-payment was due to poor management practices and gender issues, rather than an unwillingness to pay for water services. The new project, Piped Water Supplies for Small Communities (PSSC),

applied a gender strategy that increased the role of women on the tap committees, involved users in the selection of water point sites, and provided training for local managers.

Over the past several years, the PSSC has contributed to the development of community-based water supply schemes in nine urban centers in five regions of Malawi. Cash flows not only cover expenses, but also provide a surplus for re-investment. An important ancillary benefit is the considerable amount of capacity building occurring at the local level, as tap committees gain hands-on experience in community financial management.

(Source: IRC Best Practices 1996 )

The communal water point in Malawi represents a case in which an international NGO (IRC) performed a catalyzing role that led to improved community management of a drinking water source. The experience highlights several aspects that should be considered when integrating community participation in water supply management:

the community quickly learned that flat rates would not satisfy a large group of users with different needs and water demands;

user groups perform an important function in monitoring water quality;

user group committees are capable of financial management and facility maintenance;

since women are the primary users of water point sources, their increased participation on local committees improves overall performance.

4) Community Managed Vending Kiosks: Distribution of water by community groups around a common water source.

Water is sold by the bucket by the local utility, or else the utility gives the vending rights to concession holders in the private sector. In a growing number of cities community groups control the vending, and a committee manages income and maintenance. In Dosso, Niger neighborhoods elect committees which then employ kioskholders to sell water at a fixed tariff (Van Wijk 1997). In Nyala and El Geneina, Sudan, settlements of 300,000 and 100,000, respectively, kiosks have eight taps and water for about four hours per day. Maintenance for the facilities and the water is paid for out of fees, which represent 1% of average household expenses. Kiosks examined and assisted by IRC in a recent survey are all making a profit (IRC 1997).

4) "Local Distribution Net" Community organizations buy water in bulk from the urban utility. Two methods of water supply are provided in this system: a) a filled reservoir or b) a metered master connection. The community group acts as distributor to residents in the neighborhood through private connections or a shared tap. Neighborhoods in Tegucigalpa, Honduras appear to be implementing this type of system successfully: it serves 10% of the urban poor and has driven away the more exploitative private vendors that had accounted for up to 20% of local monthly incomes (see Box 2).

Box 2

Tegucigalpa, Honduras

Approximately one half of Tegucigalpa's population of 850,000 live in 225 peri-urban communities on steep hills surrounding the city center. Due to steep topography and poor aquifer conditions, most of the city's potable water is imported. Residents of the peri-urban areas, have to rely on private vendors who charge exorbitant commercial rates of up to 30% of average household incomes.

In an informal public-private partnership, the national water authority, SANAA, established an executive unit for marginal settlements (UEBD) to take responsibility for providing water to settlement residents that were not connected to the main supply system. Working with community-based groups, UEBD implemented a range of technologies through different types of structures, depending on topography, demographics and financial condition of a given community. Options included house connections, public stand pipes, sale-in-block, or delivery to public reservoirs filled by water trucks and/or boreholes.

In 1993 six communities had established public-private partnerships in which the community assumes responsibility for the operation and maintenance of an "autonomous distribution net". They are all self-reliant, contributing up to 50% of capital costs, 58% of all households have connections. According to a UNICEF update, by 1996 this model had been widely implemented and approximately 150,000 people in 80 communities have now benefited from the initiative.

The barrio water boards are one of the only examples in Honduras where investment costs are being recovered in the water sector. The central public water supply system has yet to implement cost recovery policies. In addition, one of the brightest results of localized water service provision is local empowerment. To maintain the current infrastructure system and sustain growth, the Chamber of Commerce and the SANAA project have established Agua Para Todos (Water for All) which conducts

fundraising from domestic donors as well as international donor agencies to help with expansion of the program.

Source: IRC reports and the World Bank/UNDP Water and Sanitation Project

<<[http://www.wsp.org/English/urban\\_projects.html](http://www.wsp.org/English/urban_projects.html)>>

5) Autonomous Water Supply: User households participate as members of a local water users association with an elected water management committee. The association may either construct or assume responsibility for multi-stage or biological filtration systems, local sewerage system, and solid waste collection. (See Box 3)

Box 3 La Sirena, Cali, Colombia

The La Sirena peri-urban settlements lie on steep hillsides that require pumping water at very high costs. With 53% of the residents engaged in the "informal economy", there are few financial resources to fall back on. The community sought assistance from SIRENA, an inter-regional center for water supply and drainage, which helped establish a multi-stage filtration mechanism and a pvc network to render and distribute potable water. Since construction in 1987, a user-elected Action Committee of volunteers has established a differentiated tariff according to type of household (households with tenants versus single family households). The Committee also employs two operators to monitor water quality and conduct daily network inspections.

In 1996, the community succeeded in financing improvements by obtaining outside financing. Tariffs pay for operation and maintenance costs, but future expansion will involve additional external financial support or direct financing. Some of the ancillary benefits associated with this project illustrate the spin-off potential of local capacity building and social service provision. "The experience of La Sirena showed to the institutions which manage the water and sanitation sector in the city of Santiago de Cali that organized communities, using technologies which they are able to understand, operate and maintain and sustain are capable of assuming the autonomous management of their systems once institutional support is provided" (Mariela Garcia of Cinara).

Source: IRC Best Practices, 1997

#### Financing community-based water supply initiatives

The most important lessons from the above examples are:

Consumer groups within extended urban areas are capable of providing water supply services where existing coverage is inadequate;

The idea of water as a social and economic good is acceptable in poor neighborhoods and peri-urban areas;

Water supply systems can pay for themselves and capture a profit; and

Community groups are capable of managing funds and debt service.

In order to avoid the low level equilibrium of expensive and unreliable service, therefore, governments and private sector partners should concentrate on increasing the types of community-based initiatives described above. The missing link, however, turns out to be access to financing. While motivation and initiative are commonly quite high among urban immigrants, neighborhood groups and entrepreneurs lack financial resources to invest in their own businesses and communities. As Frank Hartvelt has put it, "without access to credit, the poor will have no access to water."

In general, community participation in infrastructure development has been limited. The transportation sector is a notable exception in some cities where semi-public mini-buses are the norm. In these low-income countries, clan-based cooperatives purchase, license and maintain vehicles for public access. Very often the operators rely on complex indigenous financing practices that usually involve borrowing money from numerous households within a given community and paying the money back based on informal commitments.

Examples of community-based water supply initiatives, such as those provided by IRC, suggest that the entrepreneurial spirit of poor urban residents translates well into the water sector, but financing local systems has traditionally relied on grants and government funding. In the future, water systems will continue to rely heavily on formal credit mechanisms. This may have to do with the fact that water is first and foremost a social necessity and its delivery has the characteristics of a natural monopoly. Without institutional frameworks, such as regulations, and financing opportunities for organized groups, exploitative situations arise in which entire communities are forced to rely on the exorbitant prices of street vendors and truck delivery systems.

In urban neighborhoods beyond the reach of the municipal water mains, where there are no household connections or alternative community-based structures, households are forced to buy their drinking water from private water vendors, very often at costs that exceed 10 times the price per liter of household connections. As a result, these households end up paying 30% of their monthly income on water, which is significantly higher than the percentage of monthly incomes paid in connected neighborhoods. These disparities draw attention to an irony in urban water supply - the poor demonstrate a higher "willingness-to-pay" for lower quality services than high income neighborhoods. In places where alternative providers are available, the poor can realize substantial savings. In Sudanese cities, for example, communal kiosk users spend roughly 1% of their household expenses on water; versus 25% in other poor neighborhoods (IRC, Best Practices). The discrepancies appear to be so high, that "if the suppliers could attract even 15% to 20% of the outlay that now goes to water vendors they could provide a lower cost service that could pay for itself within a few years" (Franceys and UNICEF, 1991).

To date there has been little attention devoted to financing community groups to create opportunities in the water supply sector. The primary constraints limiting access to institutional forms of credit for water supply projects in poor neighborhoods are:

- water supply loans amortize over long periods, due to extended pay back periods;
- the potential for water supply enterprises to earn a profit is not widely recognized;
- communities have no track record when it comes to loan repayment;
- smaller loans have proportionally higher transaction costs;
- low-income households or groups that need credit rarely have traditional forms of collateral against which to guarantee loans;
- financing institutions may be wary of the capacity building components of efforts to establish local water supply enterprises.

#### Approaches to financing community initiatives

Although there is a growing body of studies on microenterprises and credit to small businesses in developing countries, the literature on financing community water supply systems is scarce. Only recently has community-based credit, rather than grants, been identified as a mechanism for addressing the market imperfections that result in low levels of access to safe drinking water in many urban settlements.

The literature search conducted for this report identified three experimental approaches: 1) household credit for small-scale housing improvements, such as on-site water supply and sanitation facilities; 2) loans and guarantee funds for community based service providers; and 3) small enterprise development financing. The latter two approaches are mostly in the proposal phase, though the International Secretariat for Water has developed an elaborate business plan for financing small enterprises around water supply services in several urban centers.

#### Household Credit

Household credit is the subject of USAID's Applied Study 2, which examines home improvement loans as a means for increasing the number of individual households with on-site access to drinking water supplies. A household's physical proximity to public mains will determine the type of facilities to be developed, but for the most part, lending would occur on the micro-finance level. To purchase and install most of the required hardware, from taps and twin-pour flush latrines to a conventional septic tank requires outlays of no more than US\$600. The rationale for focusing on household credit is that such arrangements are fairly straightforward and "there is a body of banking principles, practices and experience that can be applied" (Varley 1995).

Varley offers a list of alternative sources for supplying credit services, ranging from a central water service provider with a vested interest in enabling households to pay for connection fees to specialized loan funds for household credit managed by NGOs and/or community organizations.

A potential role for household credit exists in circumstances like Buenos Aires, where the private sector operator of the public water supply system extended mains out to the poorer neighborhoods. The idea was to provide access to the public supply on a by-demand basis. However, after a period of time had elapsed there were few if any connections to the grid. One explanation attributed the poor response to a lack of sufficient disposable household capital to pay for the high connection fees. Although another possible explanation is that user needs in these neighborhoods were met adequately through alternative means, it stands to reason that access to household credit schemes would have encouraged more household connections (Kristin Komives, Internet Conference).

The water company's response actually corresponds to one of Varley's recommendations. Instead of providing household credit, Aguas Argentinas implemented a sweat equity option:

"Significant numbers of people were refusing to be connected to the public water supply because of high connection fees. Obviously, this was not satisfactory for either the city or its people, or for us. In these areas...a large part of the economy is based on barter and exchange of labor..."

"We provided water distribution pipes and all other relevant equipment. The pipes were laid by a work force drawn from the local community, but under our technical and health & safety supervision. As a result, the community has no connection fee to pay, skills in the local work force are improved and the community receives its supply of water. In return, as the water company, we have new and valued customers." (Ian Robson, Internet Conference)

There are social equity arguments that call this form of bartering with sweat equity into question, especially in neighborhoods where employment levels are quite high and residents do not have the time to devote to infrastructure construction. In this case, they would have to hire out contractors.

The mechanism for providing household credit that may be most favorable, according to Varley and others, involves using NGO's as finance intermediaries. In Tegucigalpa, by 1993 the national government had provided loans to Honduran NGOs for onlending to approximately 4,000 households for water supply and sanitation. Repayment was on schedule for almost all of these loans (Varley 1995). This type of activity fits into the recent trend for many developing country NGOs to recover costs through fee-based services. By onlending at rates slightly higher than the payback rate to the original lending institution, NGO's can pass on some costs to their target audience, along with capacity building skills.

The value of household credit is significant, especially where water mains lie in close physical proximity but are inaccessible due to prohibitive connection fees. However, it is one piece of a larger matrix. It will not be adopted as a comprehensive strategy for meeting the demand of all urban water consumers, due to the requirements of having a centralized facility from which to draw supplies in or near the community. The next step towards the goal of wider access in unserved communities are the community-based structures outlined above.

Loan Guarantees for community-based organizations

In their paper "Financing Community Water Supply: Loans, Guarantee Funds and Supporting Institutions", Frank Hartvelt and Anton Deiters propose developing community-based lending mechanisms to finance "small point source or reticulated community water supply systems." Again, the problem arises as to how services designed to benefit a community can be financed, since community groups have no formal public status, and are not legal entities. Under present circumstances these characteristics preclude most formal sources of credit, such as banks, from transacting with them. "There is therefore a need for promotion, education, to create awareness among the banks and mobilize bank funds for the construction of water supply... And there has to be enabling policies, legislation and regulation" (Hartvelt et al. 1997). The interaction of civil society, government and the private sector, therefore, need to evolve partnerships to create the enabling environment that is called for to assist service providers at the local level.

Two types of financing mechanisms have been proposed that will help to achieve constructive partnering between governments, NGOs and private lenders: formation of specialized community water supply funds and international or national guarantee funds (Hartvelt, et al. 1997, International Secretariat for Water 1997). With a loan guarantee fund, partner organizations can obtain credit from a local bank which would otherwise refuse credit for want of collateral. Such a fund is described as "a promising option to mobilize bank funds to finance water supply systems" (Hartvelt et al. 1997).

The International Secretariat for Water has created what appears to be the first business plan for a comprehensive International Community Water Fund. The fund will facilitate access to loans, guarantees and grants to encourage the establishment of business enterprises providing water supply services in low income urban areas. The fund's strategy involves:

- making better use of existing, underutilized human resources;
- building local institutional, technical and financial capacities to manage sustainable water services;
- forming partnerships between local entrepreneurs, external investors and a network of support NGOs.

The creation of small water supply companies will be made possible through a hierarchical structure of loans and debt financing. At the apex, an International Community Water Fund (ICWF) will obtain direct contributions, deposits, investments, loans, technical grants and capital injections from a host of private community investors, financial institutions and donor agencies. These pooled resources will allow the ICWF to provide debt equity to a national partner in a developing country,

which in turn will offer loans at low interest (but market-based) rates to support the creation of small companies. An important component of this financing structure is the establishment of a technical assistance development fund, which will provide capacity building at the national level.

The ICWF initiative (created in October 1997) has not yet had a chance to become fully operational. At least two of the eight projects in its portfolio (Bogota, Colombia and Cebu, Philippines) are on hold due to local elections and a third (Senegal) is a World Bank project that will be implemented on a much grander scale than can be replicated by other ICWF-type projects (Gabriel Regallet, personal communications). In addition, the Bogota project is not for water supply per se; financing will be for enterprises engaged in solid waste management. However, the model for Bogota will be the same for the water supply enterprises and should translate well.

Early experience has already highlighted key hurdles that the ICWF approach has to address. Mitigating potential conflicts with formal trade unions is one. The reluctance of formal financing institutions to provide credit for technical assistance is another. Trade unionists will probably play a role in the small companies to alleviate fears of job losses in some neighborhoods (Gabriel Regallet, personal communication). But financing the essential capacity strengthening aspects of the program will prove more challenging. Including local NGOs with their own neighborhood constituencies and development agendas, can provide much needed input in on-the-ground capacity building, though the issue of finance management training remains an issue.

Despite the challenges facing lending guaranteed lending schemes, ICWF's pilot approach is encouraging. The level of sophistication among the program's proponents is auspicious and demonstrates that local private sector involvement in the water sector is being taken seriously as a profit making venture. At this stage a primary strategy is to identify through consultation creative people among unserved urban and peri-urban populations who can start their own businesses with 5 to 15 other like-minded individuals. Providing credit and loans close to or higher than market rates (to contribute towards a revolving fund, if possible) offers huge technical and economic benefits to the community.

A more detailed understanding of how financing can be made available to small water operators will be provided in an upcoming case study of the Senegal project due out in May. For the time being, the projects proposed by ICWF are still in the planning stage.

#### Cooperative financing

Financing may also come from several sources at once to furnish resources for community based water supply systems. The package of services described below involves partial contributions from community resources and government as well as from corporate sponsorship. Such grassroots public-private partnerships should be given attention. There are special interest lending banks now emerging, based on the Grameen Bank model in Bangladesh or the SEWA Bank in India, capable and willing to provide loans directly to women's groups.

#### Ahmedabad, India

In the Gujarat Province city of Ahmedabad in India, The Parivartan Project (or, "The Slum Networking Project") addresses the water supply and sanitation needs of poor urban communities by forging links between the Ahmedabad Municipal Corporation (AMC), the private sector, NGOs and representatives of the target communities. 40% of the urban population, approximately 300,000 families, have minimal or no access to basic urban services.

A flexible, demand-based approach has emerged with a range of prices for community users to choose from. Households become eligible for services (roads and paving, water supply, underground sewerage links, storm water drainage, street lighting, solid waste management, and landscaping) by forming an association and committing Rs 2,100 each to create equity for the association. The purpose of Ahmedabad Parivartan is not only to increase infrastructure in the poor neighborhoods, but also to link up with existing city infrastructure. In the pilot stage of the project in Sanjaynagar, a slum community of 181 households, the Sharada Trust was created and financed by three sources: AMC, a major local industrial group, and a local women's bank. The pilot stage has been so successful that other slum communities have come forward to establish similar projects.

The following lessons have been cited from the Ahmedabad Parivartan:

AMC is no longer the sole provider of services. The municipal corporation now acts as a facilitator; City finances are now being used to support partnerships with civil society undertakings in infrastructure investment projects.

Source: UNDP/World Bank Water and Sanitation Program

Constraints to community management

Before making recommendations for future consideration, it is necessary to point out that small scale user run water systems have pitfalls that need to be recognized. Even if financing approaches do manage to increase overall participation in water supply, there are still important issues to address. Some of these stem from concern that examples of successful informal structures cannot be expanded to a scale that will meet the needs of tomorrow's cities. There is a strong argument that these types of efforts are band-aids or exceptional cases that on a larger scale would be too cost intensive. Community initiatives require substantial investments of human and financial resources to strengthen capacity on the local level, and constructing de-centralized mini-systems will never capture the economies of scale of a Buenos Aires or Manila concession. Labor and capital intensive capacity building requirements associated with building and operating small service utilities, monitoring performance, maintenance, managing cash flow, debt service, and re-investment require upfront outlays in manpower and funds. On the other hand, there are significant community development payoffs in human resources, as most of the technical capacity will remain in the community.

Even proponents of informal services acknowledge significant obstacles to widespread implementation: "It is very much a political issue to what extent the authorities are willing to support and enable autonomous systems to function. Handing over to the community also means losing power and (often) losing the possibility of financial gain (restricted vending can be very lucrative)" (Wegelin-Schuringa, Internet Conference). In addition, these local systems may rely on strong individual leadership that will not always be present in a community. And local systems always face the problems of local politics.

Some local systems, such as community vending kiosks, run the risk of being captured by a local strong man and his cronies, or else a neighborhood cartel. Residents of a neighborhood in Dhaka, for instance, were afraid to participate in a plan for communal water points, because a local boss controlled illegal connections to public water mains and did not want to lose his business of selling water at prices double the rate of the water points. This problem had to be addressed by an NGO, which set up two committees: one comprised of women who managed day-to-day operations; the other comprised of men who provided backstopping and resistance to the boss' attempts to disrupt the system. (Herzer et al. 1998).

Furthermore, several of the approaches outlined in this report are based on rural models. How well they translate to the urban setting might depend on the relative social cohesion of poor neighborhoods. Urban neighborhoods, unlike rural communities, tend to be ethnically diverse, and therefore will present problems for local organizers. Ethnic diversity might make community-based initiatives particularly cumbersome, depending on the degree of diversity and distrust among ethnic groups.

However, the opposite can also be true. Some urban settlements mimic socialization patterns of the countryside and establish along ethnic lines. Where this is the case, having community based water systems can ease the transition from rural to urban life. If rapid urbanization accelerates the dissolution of social customs, service-based enterprises organized along clan lines help retain cultural traits. Cultural fragmentation occurring in cities can be mitigated somewhat by community-based activities and civic responsibilities, such as collecting or dispensing water with neighbors.

#### CONCLUSIONS AND RECOMMENDATIONS

The endeavor to increase private sector participation in the urban water sector has largely focused on multinational private firms. While the "French approach" favored by the World Bank and a host of governments may be the best fit for the developing world's mega-cities, it may not be as appropriate in the numerous smaller cities. Evolving public-private partnerships should not foreclose opportunities for small domestic companies or enterprises to provide water supply where gaps are left by public sector utilities. Attention should be paid to nurturing an enabling environment for non-traditional service providers so that they can participate in the water sector where needed. Smaller operators can complement existing structures if they can find the financial means for establishing their enterprises.

One approach will be to consider hybridizing systems. Under this approach, community businesses would provide water to unserved neighborhoods by linking up with existing city systems. Feasibility will depend largely on the physical description of a neighborhood - its topography and underlying water sources - or on its proximity to water mains. In some cases, the community businesses may construct hand pumps for their water supply; in other cases they can connect to the water main provided by the government utility or private sector water supply company (Regallet, communication). To make such water development practicable in some settlements, government

officials should consider how to best rationalize land tenure so that disputes will not arise that would hinder micro-enterprise development.

Among the structures examined in this report, the "autonomous distribution net" appears to offer the best promise for unserved communities in a hybrid system. The case study from Tegucigalpa is one of the most often cited examples of successful community participation in water delivery. It would be interesting to see if financing mechanisms, like those sponsored by the International Secretariat for Water, could be applied to Tegucigalpa's barrios, instead of relying on fundraising and grants from donors. It would appear that the infrastructure is already in place to support such an experiment.

What is particularly appealing about the Tegucigalpa story is that the local distributors have an option: either they can buy the water in bulk and store in reservoirs, or else they can independently raise the necessary infrastructure to extend a connection to the publicly - or privately - owned water mains. The approach would depend on site conditions and proximity to the centralized supply.

The spin-off benefits of increasing local entrepreneurial engagement in the water sector is that profits and capacity remain totally localized. Aguas Argentinas has already come half-way in helping unserved communities participate in the municipal supply by helping poorer communities obtain connections. The flexibility exemplified in their sweat equity approach indicates that other options are viable. Public-private partnerships of the future should increase opportunities for investment and participation by civil society and small domestic enterprise.



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IRC International Water Supply and Sanitation Centre  
International Institute for Environment and Development  
UNDP/World Bank Water and Sanitation Program

<http://www.oneworld.org/ircwater/>  
<http://www.ied.org/>  
<http://www.wsp.org>

Water-and-sanitation -applied research  
WEDC  
World Bank WAIS Document Retrieval

<http://www.mailbase.ac.uk/>  
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Water Supply Journal: quarterly journal published by the International Water Supply association; contains state-of-the-art reports and scientific and technical papers presented at IWSA conferences.  
<http://www.iwsa.org.uk/home.htm>

In implementing private sector contracts, some countries (Trinidad and Tobago, Guinea, and Angola) are experimenting with an incremental approach to privatization that involves starting with smaller contracts, and increasing private investments and commitments over time (Brook-Cowen. 1997).

The following types and several of the following examples are adapted from materials prepared by IRC the International Water Supply and Sanitation Center in the Netherlands, especially the writings of Christine van Wijk and Madeleen Wegelin-Schuringa.