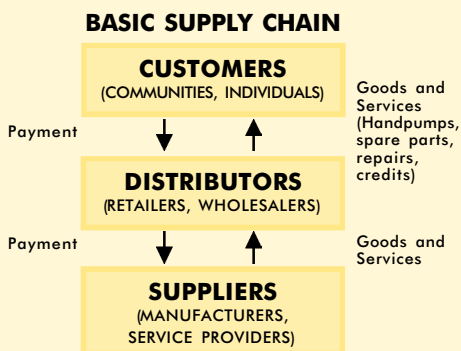




## Water and Sanitation Program

An international partnership to help the poor gain sustained access to improved water supply and sanitation services

In the rural water supply and sanitation sector, goods and services (technology, training, repair services, financial and technical services, and facility management) are supplied to customers through a supply chain from manufacturers, importers, and service providers through a network of distributors. Payment flows in the opposite direction.



The Supply Chains Initiative is a global initiative led by the Water and Sanitation Program. Collaborating partners include government departments, NGOs, and bilateral and multilateral agencies. The aim of this initiative is to develop practical tools that enable and encourage the private sector to provide goods and services related to rural water supply and sanitation. The initiative's first phase will focus on increasing the understanding of the dynamics of the private sector supply chains for handpumps, spare parts, and sanitation equipment.

## Developing Private Sector Supply Chains to Deliver Rural Water Technology

# The Growth of Private Sector Participation in Rural Water Supply and Sanitation in Bangladesh



SHEHZAD NOORANI/UNICEF

A private producer of sanitary goods.

### Summary

Twenty-five years ago, the private sector was almost completely uninvolved in the provision of goods and services for rural water supply and sanitation in Bangladesh. The situation is radically different today; it is estimated that more than 65 per cent of the approximately four million handpump tubewells have been privately installed, and there are 3,000 privately run latrine production centers, accounting for more than 65 per cent of the sanitation market. Bangladesh bears testament to the private sector's success in creating effective supply chains for handpumps and sanitary goods, which are now available from traders throughout the country, with competition keeping prices reasonable and products reliable. The private sector has demonstrated clear advantages over the public and NGO sectors in reducing production costs, and in the efficient distribution of goods and services. Whilst much of this success is undoubtedly due to the particular conditions and circumstances found in Bangladesh, it is also clear that some of the strategies used to encourage private sector participation are general and should be replicable in other countries.


# Introduction

 This case study highlights the way in which the private sector is gaining importance in providing goods and services for RWSS in Bangladesh. The research methodology combined field surveys conducted in Bangladesh with a review of supply chain studies carried out in the region, including the proceedings of two recent workshops held by the Water and Sanitation Program in Bangladesh (WSP-SA, 1999).

The private sector is often defined as the section of the economy that is not controlled by the government, and thus includes non-governmental organizations (NGOs), small and medium-sized enterprises (SMEs), and large businesses. However, NGOs are gen-

erally non-profit development organizations, with different incentives and objectives to the commercial organizations within the private sector. Therefore, in order to clarify their relative roles, this study differentiates between the NGO sector and the private sector.

## Background

 People in Bangladesh are poor, even when compared to other countries in South Asia (see *table*). Bangladesh also has an extremely high population density. As a result, more than half the rural population is landless, and most rely on daily wage labor for their income (Hossain et al., 1999).

Bangladesh's poor economic performance has been exacerbated by political instability. There has been a succession of governments since independence in 1971 and, even today, 'hartals'<sup>1</sup> regularly bring activity in major cities to a standstill. Industry in Bangladesh is still dominated by state-owned enterprises, and the country has a conspicuously bad record in attracting foreign investment (*ibid*).

Despite, or perhaps because of, these problems, Bangladesh has a thriving NGO sector. Projects implemented by NGOs now cover about 75

per cent of the villages in Bangladesh, and reach almost a quarter of the country's population. Several of the larger NGOs, such as the Grameen Bank and Bangladesh Rural Advancement Committee (BRAC), have devised innovative approaches to development, and the NGO sector in Bangladesh has attracted more than US\$ 500 million in foreign funds from international organizations (Hossain et al., 1999).

Bangladesh's largely agricultural economy is reliant on water. Fortunately, it is one commodity that is not in short supply. Tropical rain falls for about eight months of the year, and the Ganges-Brahmaputra River Basin and Delta are dominant physical features. However, the limited land available forces much of the rural population to cultivate the fertile alluvial sediments in the delta, thus risking the frequent and catastrophic floods that inundate the area.

The use of groundwater for irrigation and for domestic water supply boomed in the 1970s. Previously, most of the rural population obtained its drinking water from ponds fed by rainwater. Many of these sources were polluted and more than a quarter of a million children died every year from water-borne diseases (World Bank, 1999). Therefore, donors actively encouraged intensive efforts by



Comparative regional data					
Country	Population (millions)	Land area (000's sq. km)	Pop. density (per sq. km)	GNP per capita (\$)	Child malnutrition (%)
Bangladesh	126	144	965	350	56
India	980	3,288	330	430	53
Pakistan	132	796	171	480	38
Sri Lanka	19	66	290	810	38

*Data taken from World Development Report 1999/2000*

<sup>1</sup> Political demonstrations or general strikes.

### Access to safe water and sanitation

Indicator	1982	1995
Access to safe water (%)	40	84
Access to sanitation (%)	4	35
Child mortality rate (per 1,000)	211	104

Data taken from World Development Report 1999/2000 NB: These figures do not take account of water that is unsafe due to arsenic contamination, and are currently being revised

government and NGOs to shift rural water supplies from these traditional surface water sources to microbiologically purer groundwater sources. Fortunately, the shallow water tables and favorable geological conditions found in much of the country make the installation of low-cost handpumps relatively simple and cheap. Millions of handpumps have been installed during the last 20 years, and it is now estimated that 97 per cent of rural drinking water supplies in Bangladesh are obtained from groundwater.

Access to safe water and to sanitation in Bangladesh has grown markedly since the early eighties (see table), and as a result, both the incidence of diarrheal diseases, and of child mortality related to water-borne diseases have decreased dramatically (Khouri & Chowdury, 1999).

The public sector water supply and sanitation program in rural Bangladesh is, in some ways, a remarkable success story. It transformed itself from a relief and rehabilitation program in the 1970s into an integrated hardware, delivery, and hygiene education program in the 1980s. In the 1990s, the focus shifted towards technical innovations, institutional development, improved monitoring, quality assurance and greater partnership with NGOs. An enormous number of tubewells and latrines were constructed, but the large-scale public

programs tended to concentrate on coverage rather than behavioral change, and the impressive figures often disguise the failure to address issues such as equity, efficiency, and sustainability.

## Private Sector Participation in RWSS

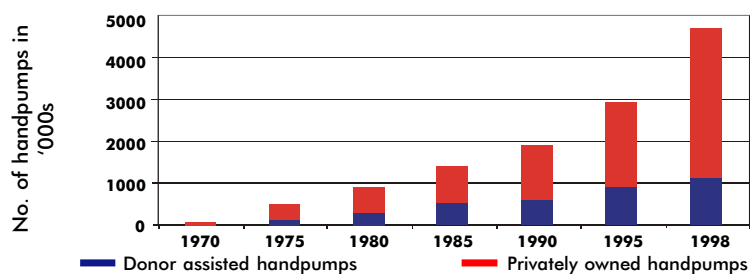
Twenty-five years ago, the private sector was almost completely uninvolved in the provision of goods and services for rural water

supply and sanitation. The development of affordable handpumps and latrines, and the rapid expansion of demand for these goods, has resulted in a radically different situation today.

There is little reliable information available on the number of handpump tubewells in Bangladesh, but it is generally agreed that there are now in excess of four million, and that more than 65 per cent of these are privately owned. The vast majority are low-cost suction handpumps, which extract groundwater from the shallow aquifers.

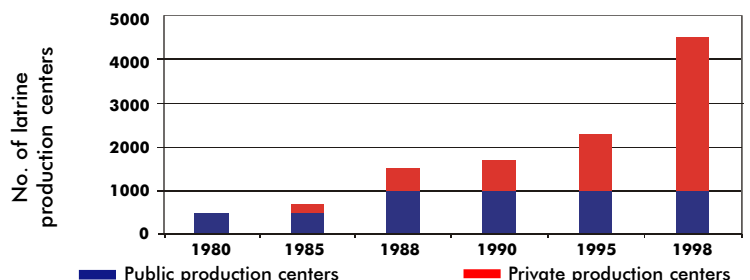
The story is similar in the rural sanitation sector. There are now about 4,500 latrine production centers in Bangladesh, of which about 900 are government-run, another 600 are NGO-sponsored, and the remaining 3,000 are private latrine production centers (WSP, 2000). This suggests that, as in the rural water supply sector, more than 65 per cent of the sanitation market is controlled by the private sector.

Figure 1: Handpump ownership in rural Bangladesh



From data collected by Shamsuddin, 1999

Figure 2: Latrine production centers in Bangladesh



From data collected by Shamsuddin, 1999



# Handpumps

The availability of potable groundwater varies around the country, and this dictates what type of handpump can be used. About 75 per cent of Bangladesh has shallow groundwater, which can be extracted using simple suction handpumps, such as the UNICEF Number 6. However, suction pumps do not work when the groundwater is more than about 7.0 m below ground level, so in areas with deeper groundwater, water is obtained from deepwell handpumps, such as the Tara, or using mechanized pumps.

In the coastal areas, the groundwater is shallow, but is often too saline to use for drinking. Fortunately, the deeper aquifers in these areas are generally potable, and can be accessed using deepwell handpumps. Another problem occurs in hilly areas, where the rock formations make drilling tubewells difficult and expensive. Rural water supplies in these areas are generally based on surface water.

The extensive use of groundwater in Bangladesh, particularly for irriga-

tion, is starting to lower the groundwater table in some areas. This has serious implications for the users of suction handpumps, many of whom are now unable to lift water in the dry season (when the water table has dropped to more than 7.0 m below ground level).

The following sections examine the development of the supply chains for the UNICEF Number 6 handpump, and the Tara handpump, and assess their effectiveness and sustainability given current conditions in Bangladesh.

## UNICEF Number 6 Handpump

The handpump of choice for most households in shallow water table areas is the UNICEF Number 6, a simple robust suction pump with a cast iron pump head. All the moving parts are above ground, making the pump easy to maintain and repair. It is usually installed using the 'sludging' method, a manual drilling method ideally suited to the sand and silt soil profiles found in much of Bangladesh.

Initially, installation of UNICEF Number 6 handpumps was carried out by the public sector, and the pumps were not readily available in local markets. However, the low-cost and easy installation of the UNICEF Number 6 soon caused a huge demand, and private manufacturers and traders began to take interest. Versions of the UNICEF Number 6 handpump, spare parts and repair services are now available throughout Bangladesh, and the handpumps are ubiquitous in villages in shallow water table areas.

The UNICEF Number 6 handpump is well suited to the conditions in Bangladesh. Unfortunately, in a country where 50 per cent of the rural population lives below the absolute poverty line<sup>2</sup> (Hossain et al., 1999), it is still too

expensive for many of the poor. An NGO called International Development Enterprises (IDE) recognized this problem, and has used funding from USAID to develop an even lower cost alternative, which they have christened the Janani pump.

## Janani Handpump

The Janani is a modified version of the UNICEF Number 6 pump. The height and thickness of the pump body have been reduced, thus lowering the cost of the pump, and it has been designed to be installed on a one-inch tubewell<sup>3</sup>, thus reducing both the cost of drilling and the cost of the down-hole components.

The UNICEF Number 6 handpump already had a number of variants and copies, including extra light, light and heavy duty versions, but the Janani was the first version to combine efficient, low-cost design with effective branding and marketing.

Unfortunately, the development of the Janani handpump, which started in 1997, has coincided with the full realization of the extent and seriousness of the arsenic contamination in Bangladesh<sup>4</sup>. Therefore, despite



GUY STUBBS/WSP-SA

The UNICEF Number 6 handpump.



GUY STUBBS/WSP-SA

The Tara handpump.

<sup>2</sup> Food poverty line of 2,122 kcal per adult equivalent; minimum base income required to satisfy the recommended calories is US\$ 125 per capita per annum at 1990 prices (Hossain et al., 1999). <sup>3</sup> The standard diameter of handpump tubewells is 1.5 inches (note: addition of a reducer allows the Janani to be installed on traditional 1.5 inch tubewells). <sup>4</sup> For more details, see WSP field note on arsenic supply chains.

intense interest in the Janani from handpump dealers around the country, IDE has stopped handpump promotional activities in areas with high levels of arsenic contamination, and has begun to focus its efforts on arsenic mitigation.

### Tara Handpump

In 1981, DPHE, with support from UNICEF and the UNDP-World Bank Interregional Handpumps Project, initiated research into a handpump designed to lift water from a depth of 15 meters. In 1987, this research culminated in the adoption of the Tara, a low lift, direct action PVC handpump, as the standard handpump in areas where the UNICEF Number 6 could not operate throughout the year.

The term 'direct action' refers to the vertical pumping action, in which load is transmitted directly from the user to the pump rod and piston by moving the 'T' bar handle in a manner similar to a bicycle pump. The handle is connected to a buoyant PVC pump rod, of a relatively large diameter, which displaces water in both the upward and downward stroke. This mechanism is intended to eliminate the complications of a lever-operated handpump, such as bearings, pins and rotating rod hangers.

The Tara was designed as a Village Level Operation and Maintenance (VLOM) pump, a concept that also promotes local production. In fact, DPHE were already aware of the importance of local production as the establishment of a network of private manufacturers producing massive numbers of UNICEF Number 6 pumps had underpinned the success of their rural water program in the previous decade. At the same time, they were aware that a

rapid build-up in production (DPHE's program was expected to need 60,000 Tara pumps between 1988 to 1993) would require stringent quality control, to ensure that the pumps' benefits were not lost through low quality manufacturing processes.

UNICEF produced a production manual for the Tara handpump in collaboration with the UNDP-WB

Handpumps Project and the Mirpur Agricultural Workshop and Training School (MAWTS). Although the manual was originally intended for use by UNICEF, it was also distributed to local producers who were interested in manufacturing the Tara. In addition to establishing a network of Tara handpump producers, smaller producers were also encouraged to manufac-

## PRODUCER PROFILE

### Aqua Engineering, Dhaka

Two former employees of MAWTS established Aqua Engineering in 1986. Aqua employs a permanent workforce of 10 employees and takes on seasonal semi-skilled and unskilled labor. In 1988, UNICEF asked them to provide samples of well screen, and based on the quality of this work, they were asked to manufacture 50 complete Tara handpumps. UNICEF accepted the handpumps and included Aqua on their list of prequalified Tara handpump producers.

Aqua's product range now includes a number of different handpumps, including the Tara, Tara II, Tara-Dev, and Bangla-Dev (based on Afridev) handpumps, spare parts, tools, and rainwater harvesting jars. Aqua Engineering has the capacity to manufacture 5,000 pumps per year, and need to sell about 2,000 pumps to cover their costs.

Aqua has had considerable problems in obtaining payment from DPHE, and is considering whether they want to carry on supplying them. Aqua estimates that about 95 per cent of its business has been with ESAs, and the remaining five per cent with wholesalers like Krishok Bandhu. Some ESAs (notably WaterAid – Bangladesh) are encouraging Aqua to start selling pumps to the retail market, and to develop networks of technicians and traders. The strategy involves NGOs generating demand for handpumps in the communities they work in, and then putting the potential customers in touch with Aqua, or their local agents.

**Aqua Engineering Production Figures (1999)**

Organization	NR	Type of pump
Proshika	800	
NGO Forum	150	
VERC	100	Tara II and Tara-Dev
DPHE	500	Tara
<b>Total</b>	<b>1,550</b>	

## CASE STUDY

According to Aqua Engineering and MAWTS, two of the prequalified producers, UNICEF awards the contract to the producer with the most competitive bid price, but without considering their production capacity or the financial viability of their bid. As most producers are desperate for the contract, they are willing to operate at very low profit margins. For example, Universal Engineering put in a very low bid in order to win a contract to manufacture a batch of 2,000 Tara handpumps. UNICEF did not investigate their production capacity thoroughly enough, and awarded them the entire 6,000 handpump contract. Universal Engineering then had to invest in additional machinery in order to meet the rigid production deadlines, but was unable to service their debts because of the tight margins on the contract, and was soon declared bankrupt.

ture Tara spares for the rural water supply program.

By the end of 1988, six producers based in Dhaka had passed UNICEF's pre-qualification criteria, and were invited to tender for the supply of Tara pumps. According to a recent evaluation (DANIDA, 1999), the DPHE/UNICEF program had installed almost 90,000 Tara handpumps by 1996.

Tara producers are similar to Aqua Engineering (see box) in terms of size, product range, and the constraints that they face. The one exception is MAWTS, which was originally a training organization, but has diversified into the

production of pumps, agricultural machinery and tools.

Despite DPHE/UNICEF's commitment to establishing a network of private manufacturers, to date there are between 13 to 17 prequalified Tara handpump producers, of which only about six are regularly contracted to manufacture the Tara pump for DPHE/UNICEF or NGO rural water supply programs. In recent years, NGOs including Proshika, Village Education Resource Center (VERC) and NGO Forum for Drinking Water have also been installing versions of the Tara pump in low water table areas.

During 1993-97, the Handpump

Training and Monitoring Project (HTMP) revealed several other problems with the Tara (Motaleb et al., 2000):

- pump rod joints leak (causing hollow rods to fill with water and making pumping difficult)
- direct action pumping not liked by women (who prefer the lever handle familiar from the Number 6)
- complete Tara handpumps were often not available in the open market

The Tara is a relatively expensive pump (see table) and it appears that there was little demand for the pump from private buyers, despite the enthusiasm shown by institutional buyers. Therefore, it was decided to try and develop a cheaper and more user-friendly version, known as the Jibon handpump.

### Jibon Handpump

The research, development, and promotion of the Jibon handpump provide a good example of public and NGO sector collaboration. It was financed and supervised by a group of ESAs<sup>5</sup>, and implemented by IDE, the originators of the Janani handpump. The main down-hole components of the Tara, notably the cylinder and piston assembly, were retained, but the floating PVC pump rods were changed to solid steel rods, and the direct action Tara pumphead was replaced with a UNICEF Number 6 type pump head (with traditional lever action). Further cost savings were enabled by a reduction in the diameter of the rising main and cylinder from 2.5 inches to 2 inches.

The Jibon handpump is suitable for lifting water from up to 20 meters, and it seems likely that there will be an increasing demand for it, if groundwater levels drop still further. More


Comparative handpump prices

Item	Tara		Jibon
	1989 (US\$)	2000 (US\$)	2000 (US\$)
Pump head	65	76	26
Below ground parts	85	na	61
Platform materials	25	na	10
Labor	100	na	25
Total	275	250	122

<sup>5</sup> Swiss Development Cooperation (SDC), Water and Sanitation Program (WSP) and Handpump Technology Network (HTN).

than 900 pumps have already been installed, and an extensive marketing campaign has been carried out to promote the Jibon. However, as with the Janani pump, the emerging problem of arsenic pollution in Bangladesh's groundwater has constrained progress.

## Sanitation

 During the early 1980s, UNICEF assisted the Department of Public Health Engineering (DPHE) to set up small public latrine production centers that manufactured and distributed concrete latrine slabs, concrete rings and other latrine components. Initially, the latrine slabs were provided free, but the project soon began selling the latrine products, albeit at a subsidized price.

This program was moderately successful, and contributed to household access to sanitary latrines, improving from only one per cent in 1971, to 16 per cent in 1990 (WSP, 2000). However, it was recognized that this growth was still not enough to meet the government's sanitation target of 80 per cent coverage by 2000 and that a change of approach was needed. More social mobilization was introduced, using partner NGOs, and the public latrine production centers have now sold more than 2.3 million sanitary latrines (ibid).

By the mid-eighties, the private sector was becoming involved in the manufacture of latrine components, and some support was provided to these small private production centers by the UNICEF/DPHE project. The intensive social mobilization campaigns mounted in the 1990s appear to have stimulated demand and these



Private manufacturers of latrine slabs.

private producers were successful, despite competition from the subsidized public and NGO production centers. There are now more than 3,000 private latrine production centers around the country, and UNICEF has dramatically reduced their support for the government production centers.

How did the private producers manage to compete with the subsidized products and the more organized support network enjoyed by the public producers? A DANIDA evaluation (DANIDA, 1999) reported that the public latrine production centers offered a limited range of goods, often had a lot of unsold stock which was of low quality, and that customers found the procedures for obtaining the subsidized goods to be inflexible and overly bureaucratic. In contrast, the more conveniently located private production centers were perceived to offer a wider variety of products, to be more flexible, to allow payment in installments, to provide installation services, and to offer simpler, and thus cheaper, latrine designs than those available from the public producers.

According to some estimates, small-scale private producers now supply over 90 per cent of the sanitary hardware

used by rural households in Bangladesh. As a result, donors and NGOs have altered their role once again. They are now more involved in stimulating demand, through the promotion of the health and "non-health" benefits of sanitary latrines, and in improving the quality of the products available on the open market by providing training to the private producers.

## Effectiveness of Private Sector Supply Chains for RWSS

### Availability

Rural households can usually purchase handpumps, especially the UNICEF Number 6, 'off the shelf' from local traders. Deepset handpumps, such as the Tara or Jibon, are currently less readily available, but IDE have started training their extensive network of pump dealers and technicians<sup>6</sup> in the installation and maintenance of the Jibon, and four manufacturers are now involved in production of the Jibon.

A small survey conducted for this study found that more than 80 per cent of private handpump purchasers reported delivery times of less than two days, whereas provision by government or donor-assisted programs was much slower, with less than 10 per cent of households reporting delivery within two days.

Private latrine producers generally manufacture a wide range of products suitable for local markets and conditions, and customers usually have a choice of several models, such as pour flush latrines with water seal, 'direct

<sup>6</sup> IDE has a network of 6,000 treadle pump technicians.

entry' key hole latrine slabs, and components for single pit and twin pit latrines. In contrast, public producers only offer an expensive water seal model.

There are now more than 3,000 private latrine production centers around the country, and most regions are well served. The current priority is to establish centers in the more remote areas. A new UNICEF-DPHE program, called the Hygiene Awareness and Product Information Campaign (HAPIC), is encouraging private producers to do this by providing technical and marketing training, and forging links with local credit institutions.

### Reliability

Spares for the UNICEF Number 6 handpump are cheap and widely available from private dealers. Spares for the Tara handpump used to be only available from central stores at district level, but DPHE has been encouraging private sector participation by intentionally selling spares at a higher price. As a result, a number of private traders now stock Tara spares, and provide repair services.

The lack of an effective supply chain for spare parts increases the 'down time' during which a handpump is inoperative, and can drastically reduce the reliability of a water supply. This study found that privately owned handpumps tend to have a significantly lower down time than government provided handpumps (see Figure 3). It seems likely that this effect is also due in part to the lack of 'ownership' felt by the users of heavily subsidized handpumps, and to the relative lack of private purchasers of deepset handpumps (for which parts and repair services are less readily available).

Most handpump dealers provide a

range of services including transportation, drilling, pump installation and construction of the platform. However, anecdotal evidence suggests that a lot of households come to informal arrangements for these services with members of their own community. It seems that most communities have a pool of agricultural workers that supplement their income by contracting out their services as drillers or masons. This is possible because of the simplicity of installing a UNICEF Number 6 handpump, but many privately installed tubewells do not have a platform or proper drainage. This suggests that some dealers, masons and drillers are not aware of, or do not pass on vital hygiene promotion messages to their customers.

In the sanitation sector, the rapid growth in the number of private producers suggests that there is a large demand among rural households for the affordable sanitation options that they offer. This is despite the fact that DPHE engineers are often very critical of the construction quality at private latrine production centers.

There are two main strategies employed by External Support Agency (ESA) programs to control the quality of goods that reach the rural market. The first is the UNICEF-DPHE strategy, which involves only purchasing pumps from 'approved' suppliers. This

approach gives a degree of control, but can stifle competition and innovation. The second is the IDE strategy, involving intense marketing and promotion of high quality brands and products, and the provision of detailed information to potential customers so that they can make informed choices. The IDE strategy gives pump producers an incentive to manufacture a quality product, and to offer a range of products with varying prices and qualities.

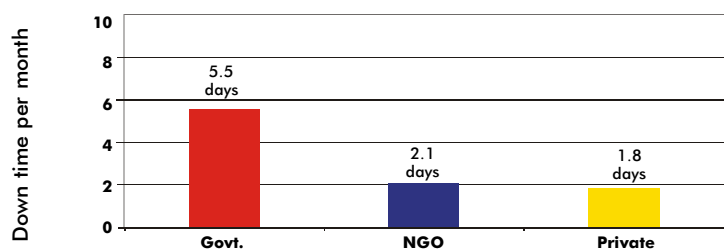
Evidence from a recent WSP study, on supply chains for low-cost treadle pumps in Bangladesh, shows that a similar strategy caused increased demand for higher quality models, and that this led to improved attention to quality control by the treadle pump producers.

### Affordability

Private sales of millions of UNICEF Number 6 handpumps and sanitary latrines in Bangladesh over the last 20 years indicate both that the products are considered affordable, and that there is a significant demand for low-cost rural water and sanitation goods. However, the same does not hold true for all goods, nor for all socio-economic groups.

Deepwell handpumps, such as the Tara, are considerably more expensive than suction handpumps, such as the UNICEF Number 6, and few private people, particularly the poor, are will-

Figure 3: Average handpump down time by type of provider



From data collected by Shamsuddin, 1999



ing or able to buy one. ESAs originally developed the Tara handpump, and they are still the main customers of the private handpump producers. Concerns about affordability have resulted in most Tara handpump programs in Bangladesh being subsidized. For example, one local NGO, VERC, provide a 90 per cent subsidy on their Tara handpumps, asking for a user contribution of only Taka 1,500 (US\$ 30) against a total cost of Taka 13,500 (US\$ 270).

A recent evaluation (DANIDA, 1999) noted that a substantial proportion of the subsidized facilities provided by ESA programs in Bangladesh, particularly within areas of deep groundwater, tend to be allocated to, or monopolized by, the richer or more powerful households within the community.

Even in shallow water table areas, many low-income households cannot afford to purchase UNICEF Number 6 handpumps or sanitary latrines, and they are dependent on other richer households, or on the limited public facilities.

The low-cost Jibon and Janani handpumps are promising developments, which should provide a reliable water supply at a lower price than previously available. In turn, this should increase the number of people able to afford their own handpump, and thus encourage more private traders to enter the supply chain.

The private latrine production centers have also had an impact on affordability. By offering a range of low-cost latrine models, and by reducing prices through improved production processes and competition, these centers have increased both affordability and sales. Clearly, demand-responsiveness and flexibility have been important factors in their success.

### Market Size

Previous public and NGO sector policies on subsidies have hampered the private sector. The varying levels of user contributions asked for, and political pressure to reduce or even cancel the requirement for user contributions to government programs, have made it difficult for private producers to price their products competitively. However, there has been a huge demand for low-cost water and sanitation goods, and this appears to explain the continuing growth of private sector participation in rural water supply, despite competition from the subsidized programs.

The public and NGO sectors do not have the funds, or the capacity, to meet the demand for subsidized water and sanitation goods and services. In the early 1990s, both UNICEF and the government made the decision to withdraw most of the subsidies for public sector provision of handpump spares, and for public latrine production centers. This is unlikely to adversely affect the pace of water and sanitation cov-

erage, as the majority of latrines and handpumps are already purchased from private traders or producers.

## Constraints on Effectiveness of Private Sector Supply Chains for RWSS

### Procurement Policies

DPHE is supposed to advance 50 per cent of the total payment for the manufacture of handpumps (termed a "mobilization advance") to producers, but often do not. Payment on completion of the order is also often delayed. For example, MAWTS have refused to bid on DPHE tenders for Tara handpumps because they are still waiting settlement of previous invoices. Lately they have had to resort to legal action to recover their dues. Aqua Engineering is currently owed Taka 1,700,000

Figure 4: Preferred source of handpumps

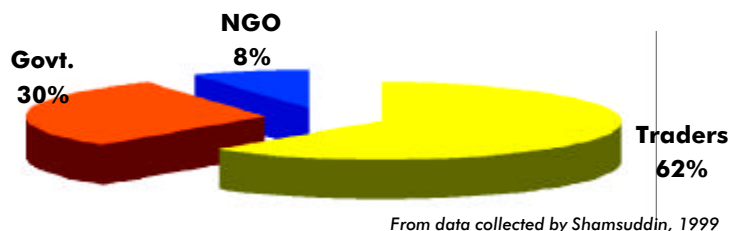
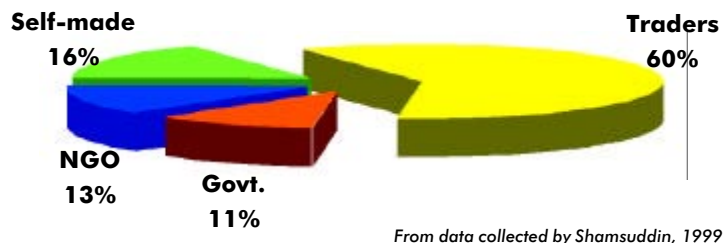


Figure 5: Preferred source of sanitary latrines



(US\$ 34,000) by DPHE, and they estimate that it can take DPHE a whole financial year to settle their account.

Private producers have also complained of seasonal or “lumpy” procurement by ESAs. In particular, UNICEF-DPHE are reported to order suddenly and in large quantities, making it hard for small producers to use their production capacity efficiently, and thus making it difficult for them to complete contracts on time.

### Standardization

It has been argued that standardization encourages local production by clarifying requirements for manufacturers and inspection agencies, simplifying training, and giving the customer confidence in a product. However, the findings of this study suggest that these issues are only important when the main customers are institutions, and that rigid ESA specifications tend to limit local innovation by private producers. When an external group is defining and controlling product specifications, manufacturers cannot respond to demand, and market forces cannot control price or quality.

Private latrine producers have demonstrated that, when allowed, they have the flexibility to adapt designs to local materials and requirements, and to provide affordable and demand-responsive products. In contrast, the Tara handpump is a standard product that is well designed, but has not been successful because it was not considered appropriate by women users, and is too expensive for households to purchase on an individual basis. Its shortcomings have eventually led to the development of the more affordable and appropriate Jibon handpump. A WSP study in Pakistan found that when

a large ESA-funded handpump program finished, private sector participation rose dramatically, and innovative hybrid handpumps rapidly began to replace the less affordable ‘standard’ handpumps.

Private producers in Bangladesh have also complained that they cannot patent innovations. This means that other producers soon copy their ideas, and that they get little benefit from investing in research and development.

### Finance


This study found that the private sector actively competes for customers by offering credit facilities. Pump manufacturers provide goods to their network of dealers on credit and the dealers, in turn, provide credit facilities to their customers. Perhaps the weakest link in the chain is the lack of availability of credit for manufacturers.

All seven handpump manufacturers reported problems in obtaining credit. It was also noted that the current bank interest rates of 16 to 18 per cent are higher than the expected Return On Investment (ROI) for most of their product range, including the popular UNICEF Number 6 handpump. Furthermore, banking procedures are overly bureaucratic, and there are often ‘hidden charges’ that have to be paid to ensure a reasonable level of service.

Conversely, private latrine producers stated that low start-up costs were a major factor in attracting them. Of the private latrine producers interviewed, 65 per cent had invested less than Taka 100,000 (US\$ 2,000) to start their business, and 20 per cent had invested less than Taka 20,000 (US\$ 400).

## Linking Suppliers and Customers

---


 Building up a dealer network is the key to reaching customers and to building up a market share. However, most small pump producers do not have the resources, in terms of staff or funding, to build up these networks, and they tend to rely on word of mouth to expand their businesses.

IDE has recognized this problem, and marketing features prominently in their approach. IDE facilitates contact between its affiliated pump manufacturers and regional traders and technicians, and provides them with promotional materials and training.

The strengthening of the supply chain improves understanding of demand and allows producers to plan their production runs better, and to predict resource and transportation requirements more accurately. This increases their confidence and encourages investment. They can also be more demand-responsive, and get new and innovative products to the market more quickly.

## Conclusions

---

 The findings of this research confirm the importance of private sector participation in the rural water supply and sanitation sector in Bangladesh. Low-cost handpumps and sanitary latrines are now available in stores throughout the country, and the majority of these products installed in rural households

today are bought from private producers or traders.

Public sector intervention in the rural water supply and sanitation sector has had a vital demonstration effect. Government programs have introduced low-cost technologies and raised public awareness considerably. However, these programs have tended to be centralized and rigid, and have not been able to meet the diverse demands of rural communities.

The private sector realized the potential of the new technologies by adapting them to local conditions and demands, and by dramatically increasing availability. The heavy subsidies provided by public and NGO programs limited their coverage, and competition for these scarce goods and services inevitably favored influential households. Private producers offered handpumps and sanitary latrines to those excluded from the subsidized programs. They also managed to make the goods and services more affordable by improving production techniques, offering simpler low-cost variants of the standard products, and allowing customers to purchase components as and when needed. Increasingly, the more demand-responsive and non-bureaucratic service provided by the private sector led to rural households choosing them over the subsidized public sector.

The public sector played a major role in building the capacity of the private sector. From the very beginning of the UNICEF-DPHE program, local pump manufacturers were encouraged to become involved in handpump production, and drilling and construction were contracted out to the private sector. During 1997-99,

the UNICEF-DPHE program started providing support to private latrine producers, including training 800 producers in marketing and in methods of improving the quality of their products. Several NGOs are now adopting similar approaches, and it appears that the public and NGO sectors have realized that informing demand, and improving the goods and services provided by the private sector through capacity building, are often more effective ways of increasing access to safe water and sanitation than developing their own expensive centralized programs.

The small private producers have formed very effective local supply chains, and competition between them ensures that production is efficient and that goods and services are relatively affordable and reliable. However, most of them do not have the capacity to conduct research or to develop new technologies, and this is another field where the public and NGO sectors can play a vital role.

The discovery of widespread arsenic contamination, and of the lowering of the water table by excessive groundwater extraction, threatens the access

to safe water of many millions of people in Bangladesh, and may make redundant many of the products currently offered by private producers. Collaborations between the public, NGO and private sectors are working towards low-cost solutions to these problems, including cheaper deepwell handpumps, and household level arsenic removal units (see *WSP series on Supply Chains 'Arsenic Mitigation in West Bengal and Bangladesh'*).

Another area of interest for the public and NGO sectors is quality control. One of the downsides of competition between private producers in a relatively undeveloped market is that efforts to reduce costs often lead to lower quality products, which result in poor customer satisfaction and fewer health benefits. The conventional ESA response to this problem has been to force manufacturers to standardize products, often using rigid international specifications and procurement procedures to ensure high quality. Unfortunately, this approach tends to increase costs, by disregarding local materials and production processes, and to stifle local innovation.

A lesson highlighted by the WSP

## LESSONS LEARNED

- Removal of subsidies increased private sector participation.
- Private sector was able to provide more flexible and innovative services than the public or NGO sectors.
- Private sector produced more affordable and demand-responsive products.
- Private sector participation was higher where start-up costs were low.
- Range of products and prices is preferable to a single standard product (allows market to drive development).
- Effective supply chains can be developed through social marketing and network-building.
- Public and NGO sectors have important roles to play in capacity building and research.

study on supply chains for treadle pumps (see *the case study in this series*) is that encouraging producers to offer a range of products, of varying quality and price, and informing customers about the benefits of particular products and designs, can provide a more effective and sustainable solution to the problem of quality control. In the treadle pump case, customers soon stopped buying the cheaper but less durable models, and producers quickly realized that there was a surprisingly large market for more expensive but more reliable models. These findings were also mirrored in the WSP study of Afridev handpumps in Pakistan (see *the case study of supply chains for Afridev handpumps in this series*), where private sales of the standard 'public domain' Afridev were hindered by its high cost, until the development of more affordable 'hybrid' Afridev handpumps by the private sector.

The private sector has clear advantages over the public and NGO sectors in reducing production costs, and in the efficient distribution of goods and services. Bangladesh bears testament to the private sector's success in creating effective supply chains for UNICEF Number 6 handpumps, for sanitary goods, for treadle pumps, and for oral rehydration salts (ORS). Ten years ago, most of these products were either not available, or were only available in limited numbers from subsidized government programs. Today, they are available from private traders throughout the country, and competition keeps prices reasonable and products reliable.

Private sector participation in rural water supply and sanitation in Bangladesh appears to be both effective and sustainable. Whilst much of this success is undoubtedly due to the

particular conditions and circumstances found in Bangladesh, it is also clear that some of the strategies used to encourage private sector participation, notably the remarkably effective approach adopted by IDE, are more general and should be replicable in other countries.

## References

DANIDA (1999) 'Evaluation – Rural Water Supply and Sanitation Program, Bangladesh', DANIDA

Hossain, M, Islam, I and Kibria, R (1999) 'South Asian economic development: Transformation, opportunities and challenges', London: Routledge

Khoury, N and Chowdury, S (1999) 'Mitigating natural groundwater contamination in Bangladesh: Early policy lessons from a development project' in World Bank 'Groundwater – Legal and Policy perspectives', Proceedings of a WB seminar

Motaleb, A, Ferdausi, S, Erpf, K, Mudgal, A, Shah, S and Islam, Md. (2000) 'Technological development never stops: a story of Jibon deepset handpump tubewell in Bangladesh', HTN workshop on Civil Society and Government Partnership in Rural Water Supply, Hyderabad, India

Robinson, Andy (2000) 'Demand or dependency: Afridev handpumps in Pakistan', New Delhi: Water and Sanitation Program - South Asia (unpublished)

Shamsuddin, Sk-Abu Jafar (1999) 'Rural Water Supply and Sanitation in Bangladesh: Factors that Influence Private Sector Participation' (unpublished)

World Bank (1999) 'The Bangladesh Arsenic Mitigation Water Supply Project: Addressing a massive public health crisis' from Web site: [www.worldbank.org](http://www.worldbank.org)

Water and Sanitation Program - South Asia (1999) 'Growth of small-scale private sector and micro-credit financing for rural water and sanitation services in Bangladesh', Dhaka: UNDP-WB Water and Sanitation Program

Water and Sanitation Program - South Asia (2000) 'New approaches to promoting sanitation in rural Bangladesh', New Delhi: Water and Sanitation Program

## Water and Sanitation Program

1818 H Street NW  
Washington DC 20433 USA

Phone: +1 (202) 4739785

Fax: +1 (202) 5223313, 5223228

E-mail: [info@wsp.org](mailto:info@wsp.org)

Web site: <http://www.wsp.org>

## Water and Sanitation Program-South Asia

55 Lodi Estate  
New Delhi 110 003, India  
Phone: (91-11) 4690488-89  
Fax: (91-11) 4628250

Flat # 03-04, Building 'A'  
Priya Prangan, 2 Paribagh,  
Dhaka 1000, Bangladesh  
Phone: (880-2) 8611056-68  
Fax: (880-2) 8615351

## Other publications in this series:

1. The Treadle Pump: An NGO Introduces a Low-cost Irrigation Pump to Bangladesh
2. Afridev Handpumps in Pakistan
3. The Growth of Private Sector Participation in Rural Water Supply and Sanitation in Bangladesh

## December 2000

The Water and Sanitation Program is an international partnership to help the poor gain sustained access to improved water supply and sanitation services. The Program's funding partners are the Governments of Australia, Belgium, Canada, Denmark, Germany, Italy, Japan, Luxembourg, the Netherlands, Norway, Sweden, Switzerland, and the United Kingdom; the United Nations Development Programme, and The World Bank.