



Water and Sanitation Program

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

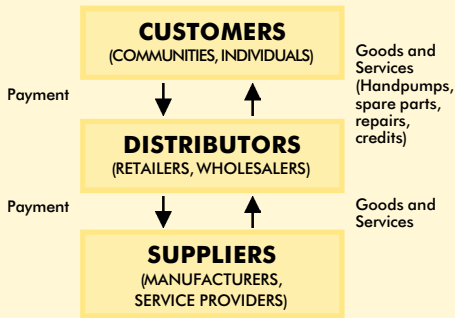
Developing Private Sector Supply Chains to Deliver Rural Water Technology

Afridev Handpumps in Pakistan

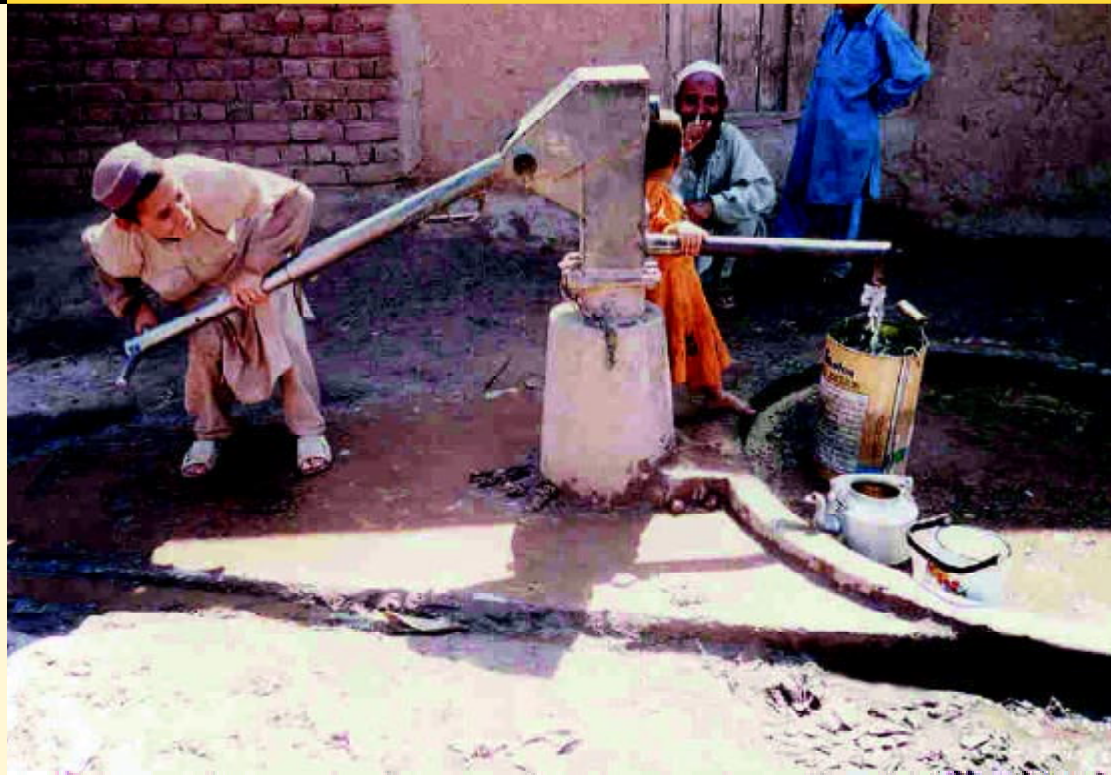
Private demand emerges for an affordable and reliable pump

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.

BASIC SUPPLY CHAIN




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.



Summary

Ten years ago, the Afridev handpump was relatively unknown outside of Africa. Today it is manufactured in three out of the four provinces of Pakistan and more than 80,000 locally manufactured Afridev handpumps have been installed in the region. This case study examines how this transformation occurred, and the effectiveness of the current supply chain for Afridev handpumps and spare parts in Pakistan. In particular, it focuses on the increasing importance of the private sector in a market that has been dominated by External Support Agencies (ESAs) and the local government.

Background

 Afridev handpumps were originally introduced to Pakistan in the late 1980s by ESAs organizing relief operations for the influx of Afghan refugees to the North West Frontier Province (NWFP). The Afridev was selected following field trials of a number of handpumps, and it quickly became the standard community handpump used in the region.

More than 10 years after the introduction of the Afridev handpump, the conditions in NWFP and Afghanistan have not improved. Recent political upheavals in Pakistan have weakened the economy, and rural infrastructure remains basic. Although paved roads connect most towns, and rural electrification is widespread, more than 40 per cent of the rural population does not have access to safe water.

Rural communities in Pakistan generally prefer mechanized water supply schemes, but the local government does not have enough funds to provide schemes, or even to operate and maintain existing schemes. There are also major problems with the quality and availability of the electricity supply, and tariffs are rising rapidly. Clearly, the reliability and sustainability of rural water supply systems that depend on electric pumps is questionable under these circumstances.


In Afghanistan, the situation is worse still. The fighting continues, as does the flow of Afghan refugees to Pakistan, and many of the refugee settlements are now effectively permanent. Extensive damage to the rural economy and infrastructure has eliminated public services in many areas, and people's capacity to pay for private services has

been drastically reduced. As a result, many parts of Afghanistan have seen a return to non-mechanized water supply systems.

Thus, despite the troubled economic and political environment in the region, there is a significant demand for reliable and affordable handpumps, and the popularity of Afridev handpumps has grown. Since 1990, the number of local manufacturers producing Afridev handpumps has increased threefold, and the rise in the number of traders

dealing in Afridevs, or their spare parts, has been greater still.

Afridev Handpumps in Pakistan

 The introduction of Afridev handpumps into Pakistan was the result of considerable collaboration between federal and provincial



AFRIDEV HANDPUMP

The Afridev is a robust and reliable handpump suitable for lifting water from a depth of 10 to 45 meters. User-friendly features, such as inexpensive, lightweight components, and a design that allows easy removal of pump rods and below-ground components, give the Afridev a clear advantage over alternative products. The concept and design of the Afridev handpump was a co-operative effort; the Swiss Center for Development Cooperation in Technology and Management (SKAT) has made the standard specifications and manuals for the manufacture and installation of the Afridev available to the public.

Two types of Afridev pumps are produced in Pakistan: the Indus pump, which is manufactured according to the standard SKAT specification; and a smaller indigenously developed Afridev variant, known locally as the Kabul pump.

governments, External Support Agencies (ESAs), NGOs, and local industry, over a period of several years. The most significant intervention was a large-scale program led by UNICEF.


The UNICEF approach was to use their program to generate a 'critical mass' of Afridev handpumps that would encourage political support, and produce enough product knowledge and process skills to sustain local manufacture. In the initial phase UNICEF assisted in setting up two factories. The Danish Committee for Aid to Afghan Refugees (DACAAR) established the first factory in Swabi, about a one-and-a-half-hour drive east of Peshawar. A company called Engineering Concern (EC), in Karachi in southern Pakistan, started the second. These factories began by using Afridev handpumps from Kenya as templates for their production and, despite some initial difficulties, they were soon producing several thousand Afridevs a year.

Production increased in the early 1990s when the Local Government, Elections & Rural Development Department (LGE & RDD) adopted the Afridev as its standard community handpump. At the same time relief activities in Afghanistan expanded, but prices remained relatively stagnant. UNICEF and DACAAR realized that this was largely due to the duopoly that the two existing manufacturers had on the supply of Afridev handpumps in Pakistan, so they set out to encourage other manufacturers to begin production. They were successful. Four more Afridev handpump factories, two in Peshawar and two in Lahore, are now in production, and prices have dropped considerably.

There were a number of reasons for the emergence of the new factories: Peshawar Engineering was started by

an Afghan political party, with the intent to increase the availability of low-cost handpumps in Afghanistan; the two Lahore-based manufacturers, Progressive Steel Industries (PSI) and Shani Engineering, were existing steel fabrication companies whose skills and spare capacity enabled them to respond to demand from the ESAs; and the final factory, Kawsar Engineering Works, was set up by former employees of the DACAAR handpump factory who already had experience in the manufacture of Afridev handpumps. However, they were all aware of the large handpump programs under way in Pakistan and Afghanistan, and of the high price of the Afridev handpump, and it was the potential value of orders for these handpump programs that was their primary motivation for starting production.

Costs

 Government departments and ESAs have both actively encouraged competition between the manufacturers. Promising manufacturers have been awarded small orders to stimulate their growth, and the large contracts have been let through competitive 'open bidding' procedures. This strategy has been effective, and the average cost of an Indus (Afridev) handpump, not including pipework and installation, is now only US\$ 130 (see Table 1). Interestingly, whilst Table 1 shows that the dollar price has dropped dramatically (more than halving since 1991), the rupee price has dropped by only 20 per cent. It appears that, because the majority of the materials are bought and processed locally, the price in Pakistan has not been mark-

edly affected by the plummeting foreign exchange value of the Pakistani rupee.

At the outset, the factories concentrated on the manufacture and galvanizing of the metal pump components (body, handle, fulcrum, rod hanger pins, and pump rods) and left the fabrication of the plastic and rubber components (plunger, foot valve, bushes, seals, bobbins) to specialist manufacturers in Lahore. In the last few years, however, the combination of a desire to reduce production costs, and increased confidence in their fabrication skills, has led several of the manufacturers to start producing their own rubber and plastic parts, and three of the factories now make the majority of their Afridev components in-house.

During the period 1991-99, inflation in Pakistan averaged over 10 per cent, so the fact that the Afridev handpump now sells for 20 per cent less than it did nine years ago illustrates the increases in efficiency that competition has produced. However, there is some concern that this price competition is starting to cause a 'race to the bottom'. Some ESA contracts are now being awarded largely on price, and manufacturers are being tempted to use inferior materials and cheaper production processes to lower their costs. PSI (Lahore) is currently underselling their competitors by 10 to 15

Year	Rs	OER	US\$
1987	-	-	700
1991	8,000	25	320
2000	6,500	50	130

OER = Official Exchange Rate

per cent, and this is putting considerable pressure on the other manufacturers to relax their quality standards.

Market Size

An accurate estimate of the total number of Afridev pumps produced in Pakistan is not readily available. More than 50 per cent of the pumps produced in Pakistan are exported duty-free to Afghanistan through relief agencies and international NGOs, but the remainder of the production is sold to domestic customers and is therefore liable for excise duty (currently 15 per cent). However, this tax is rarely paid,

and manufacturers habitually underestimate their sales and production figures in order to conceal the true extent of this evasion. Figures compiled during this study (see Table 2) suggest that at least 83,000 Afridev handpumps have been produced in Pakistan, including those exported to Afghanistan, and that recent sales have averaged about 12,000 units per year.

At present, five Afridev manufacturers supply the entire Pakistan and Afghanistan markets, which have a combined annual value conservatively estimated at Rs 80 million (US\$ 1.6 million). The trade in Afridev handpumps and parts is currently large enough to sustain the supply chain but, with about 90 per cent of annual orders coming

from ESAs or local government (see Table 3), there is considerable concern about how sustainable the Afridev supply chain really is. As a result of the fierce competition, two of the manufacturers (Engineering Concern and Shani Engineering) have reduced their production and are starting to concentrate on other manufacturing activities. Current policies and priorities in the water and sanitation sector are also changing to recognize the strong link between improvements in sanitation and health benefits; expenditure on handpumps in Pakistan is expected to decline as low-cost sanitation becomes the main focus of many local government and ESA programs.

There are at least 10 traders in NWFP that deal in Afridev handpumps and parts on a regular basis¹, a further three traders in Baluchistan, and another seven traders operating in Afghanistan. However, some of these traders deal mainly in spare parts, and their estimates confirm that private sales in Pakistan and Afghanistan probably did not exceed 1,000 pumps last year (nine per cent of annual production). Furthermore, discussions in southern NWFP suggest that most 'private sales' in Pakistan are actually made to local NGOs, as very few private individuals or groups are willing to purchase Afridev handpumps at the full price.

Despite these observations, the potential demand for Afridev handpumps and parts is high, particularly in Afghanistan. In 1999, DACAAR conducted a survey that concluded that 84,000 more deepwell handpumps are required in the rural areas of Afghanistan, and UNDP has apparently suggested that as many as 300,000 handpumps may be needed. The Afridev



Table 2: Manufacturers' estimates of Afridev production

Manufacturer	1999 Production	Total Production
DACAAR	3,300	35,000
Engineering Concern	300	15,000
Peshawar Engineering	2,900	15,000
PSI	2,100	10,000
Kawsar Engineering	2,500	6,000
Shani Engineering	-	2,000
Total	11,100	83,000

¹ Stores in Peshawar, Lachi (2), Bannu (2), Karak, Miran Shah, Tank, Parachinar, and Patajan.

Table 3: DACAAR handpump factory sales, 1999

Buyers	Indus	Kabul	Total Nr.	%
ESAs and NGOs	1,757	1,195	2,952	86
Lijnatul Dawat al Islamia	19	261	280	8
Private sales	145	40	185	5
Total	1,921	1,496	3,417	100

Table 4: DACAAR private sales in Afghanistan

Item	Jan-Mar 2000
Afridev parts (pieces)	10,872
Afridev handpumps (set)	139
Handpump installations	101

handpumps already installed also create demand. DACAAR has recently started recording the private sales made by their handpump technicians in Afghanistan, and the figures (see Table 4) suggest that this segment of the market alone is consuming more than 40,000 spare parts a year.

There is clearly a demand for Afridev handpumps and parts in the region. This demand varies geographically, being higher in Afghanistan than in Pakistan, and depends both on the number of Afridev handpumps already installed, and on the water resources available (demand is higher in non-irrigated areas with deep groundwater). The critical question, though, is how many of these people are prepared to pay for non-subsidized Afridev handpumps.

Affordability



A study on handpump use in Bangladesh (MIDAS, 1997) found that low capital cost and

the provision of subsidies were easily the most significant determinants of handpump choice, and that maintenance cost and spare parts availability both ranked very low. Clearly, information is a factor in choosing a handpump, but it remains true that most low-income groups prefer familiar products with a low initial cost, and that changing this behavior is often a long process. A 'small steps' approach is needed, and a range of low-cost handpumps may be necessary to meet the demand for incremental levels of service during this transition.

Installing an Afridev handpump is not cheap. The additional costs of the pipework, drilling, and construction raise the average cost of a full Afridev handpump installation to about Rs 25,000, which is the equivalent of the average yearly household income in Pakistan (about US\$ 500). Evidently, prospective customers are likely to be wealthier households, or groups of households prepared to share the purchase and installation costs. Unfortu-

nately, the findings of this study suggest that most people in these categories are unlikely to choose an Afridev handpump.

The cost of installing a cheap electric borehole pump is similar to the cost of an Afridev installation, and wealthier households, who can afford the electricity bills, often prefer a mechanized system, which has the added benefit of allowing them to irrigate any nearby gardens or orchards.

Cultural factors restrict the number of households that will group together to purchase a pump. The social and religious customs of the region include strict 'purdah' for women, which involves them being hidden from non-family members. Thus, most families live within small private compounds shared with a few related households, and there is a strong preference (from both men and women) for water points to be situated within these compounds. The Afridev is expensive for these small groups, and they tend to prefer cheaper 'local' or hybrid pumps.

Local handpumps are available in numerous configurations, but the pump set generally costs about Rs 2,500 (US\$ 50), approximately one-third the cost of an Afridev. These handpumps are quite appropriate and cost-effective for lifting water from less than 30 meters (100 feet), but beyond this depth the pump action becomes heavy and maintenance requirements increase rapidly. Technicians in southern NWFP recognize that the Afridev is a better investment than local handpumps at depth, and there were regular reports of Afridevs operating satisfactorily at depths greater than 45 meters (150 feet).

A recent innovation has been the introduction of hybrid Afridev pumps.

These hybrids generally combine below-ground Afridev parts with a local pump head and handle, and are about half the price of a standard Afridev handpump. One trader reported that it was local people who were buying the hybrids, whereas the Afridevs were being bought by local NGOs, and that he sold two hybrid handpumps for every three Afridevs. The development of more affordable hybrid handpumps confirms that people perceive the Afridev, and its pump head in particular, to be over designed, and that there is a demand for cheaper variants. It also shows that there is an increasing awareness of its technical advantages (minimal maintenance requirements and low-cost spare parts).

Government and donor-funded water supply programs also affect perceptions of affordability. Thousands of households have been provided with free or subsidized Afridev handpumps through these programs, and favored communities have received mechanized water supply schemes. Not surprisingly, many households are not willing to pay for facilities that others have received free, even if they are aware that many of these facilities no longer work. Expectations regarding future subsidies have reduced willingness to pay for privately-installed Afridev handpumps.

Despite the relative expense of the Afridev handpump, most Afridev spare parts are cheap. There is an understandable trend for prices to rise as the distance from the manufacturer increases, but even in the remoter areas of NWFP, the prices of the most regularly consumed parts (u-seals and plungers) were very low. In Bannu, traders were selling good quality rub-

ber u-seals for Rs 10 (US\$ 0.20), and the highest price asked for a plastic plunger was Rs 120 (US\$ 2.40). These traders noted that, while their prices were largely determined by competition, their profit on a particular product was largely dependent on the strength of their relationship with the manufacturer, that is, whether they are able to get credit, or obtain discounts by making bulk purchases.

Availability



A 1993 survey by UNICEF found that Afridev handpumps and parts were not readily available in southern NWFP, and that there were significant regional variations in demand and availability. This was confirmed by hardware dealers in southern NWFP, who noted that there has been a substantial demand for Afridev parts for the last five years, but that, until a few years ago, the only source of Afridev pumps or parts was the LGE & RDD because most of the traders did not know where the parts were manufactured, or how to obtain them. However, the situation changed with the curtailment of the local government handpump programs and the exhaustion of the stock of parts supplied by UNICEF, and there are now more than 20 traders dealing in locally produced Afridev handpumps and parts.

Fierce competition for ESA and government contracts, and fears of what may happen if these orders decline, has led several of the pump manufacturers to explore more fully the potential of sales to private customers. As a result, they are beginning to invest additional time and effort in marketing Afridevs, and in developing their supply chains.

CASE STUDY

In 1995, Abdul Rehman (Noor Electric Store, Karak NWFP) was selling small quantities of Afridev parts from his hardware store on behalf of local LGE & RDD staff. He says that he had been interested in stocking the parts for some time, but had been unable to find their source until he was asked to carry out some work for a road contractor in the Swabi area. While in the area, he discovered the DACAAR handpump factory, and he was soon buying Afridev parts directly from their factory.

He has now been stocking Afridev parts for four years, and he began stocking complete Afridev handpumps two years ago. He buys from three different manufacturers (PSI, DACAAR and Kawsar) and, in March 2000 alone, he sold 19 Indus handpumps, 12 'hybrid' Afridev handpumps and more than 300 Afridev parts from his Karak store (he has also started another five small hardware stores in Karak district).

More traders are becoming involved, and many of the established traders now enjoy credit arrangements with several manufacturers.

The evidence of this study suggests that supply choices are still determined largely by price and availability. Despite being based in Lahore, PSI has attracted a lot of business from traders in NWFP because of its low prices and, provided it is cheap, most private customers appear to buy what-

FACTORS AFFECTING AFRIDEV SUPPLY CHAINS

Enabling factors:

- road connections are generally good and the 'Bilti' system (a cheap and effective private sector trucking and delivery system) means manufacturers can deliver material easily
- communications are good (all the traders visited had telephones and most used them to place orders)
- unreliable electricity supplies in Pakistan and Afghanistan (encouraging people to use handpumps)

Disabling factors:

- political uncertainty (constraining investment by the private sector)
- government drive to improve recovery of duties and taxes (may increase pump costs)
- low-cost of mechanized water supply infrastructure (reducing demand for handpumps)
- lack of access to finance or credit by customers
- lack of effective repair services (reducing reliability)
- monopoly of cylinder liner supply by government factory (affecting price and reliability)



ever is available in their local store. However, the expanding trade in Afridev handpumps and parts is starting to bring about a growth in awareness of quality and branding among customers and traders, and this has persuaded a few stores to try stocking handpumps and parts from several different suppliers, with prices varying according to the product quality. This improvement in availability is demand-responsive, and suggests that

the supply chain is becoming increasingly effective.

The availability of reliable repair services for Afridev handpumps is a problem area. The Afridev has a low maintenance requirement, especially when lifting water from less than 30 meters (100 feet), which limits demand for repairs or routine maintenance, and has constrained the development of supply chains for these services. Many Afridev users are solely dependent on

the LGE & RDD area technicians, who make the most of this monopoly by charging high prices for their services. Even where demand is high, such as in southern NWFP, there are very few technicians able to carry out Afridev installation or repair services. Unfortunately, the lack of competition removes the incentive for these technicians to provide an efficient and affordable service, and there is evidence that some technicians have deliberately installed inferior Afridev parts to ensure that their services are regularly required.

Reliability

One of the main difficulties faced during transitions from donor-led handpump provision to sustainable private-sector provision is with the poor service provided by inexperienced private drillers and contractors. The incorrect installation of Afridev handpumps by inexperienced or predatory contractors can cause severe reliability problems and pump failures. The alignment of the handpump and the quality of the pump components become particularly important when lifting water from more than 30 meters (100 feet), as the forces involved at these depths are very high, and the strength and durability of the components are severely tested.

Low quality parts fail frequently under duress, but most of these parts (plungers, u-seals, pump rods) are relatively cheap and easy to replace, and these failures can sometimes generate a demand for better quality spare parts. Generally, the quality of Afridev spare parts in Pakistan is highly variable, and many of the traders visited

stocked cheap rubber and plastic parts that were copied from the genuine parts by manufacturers in Lahore. In an attempt to differentiate their products from these lower quality ones, several of the Afridev manufacturers have begun incorporating logos into the moulds of their plastic and rubber parts, and PSI has even started using a distinctive red rubber rather than the usual black material.

Problems with expensive components, such as the pump cylinder, which can cost as much as Rs 1,800 (US\$ 36), are more serious. Oversized Afridev pump cylinders make the footvalve leak, thus reducing pumping efficiency, while undersized cylinders cause the plunger to stick, requiring greater force to be used in pumping, which leads to frequent breakages. It appears that pumps with cylinder problems are often abandoned, either because of the cost of replacement, or because the local technician has been unable to diagnose the source of the problems.

The cylinder liners used in Pakistan are made by a government factory in Wah (near Islamabad), which is the only facility in the region able to produce brass cylinders with the requisite polished internal finish. The diameter of these liners is supposed to be carefully checked prior to supply, but there is evidence that a large number of these liners, which had been rejected as 'out of tolerance' following quality checks by one of the Afridev manufacturers, have subsequently been sold on to other manufacturers and incorporated into their Afridev handpumps.

At present, the supply of the brass cylinder liner is a monopoly, and there is little scope for reducing costs or improving the quality control at this

government-run facility. However, PSI have recently started importing brass cylinder liners from Dubai on an experimental basis, and DACAAR are currently exploring ways of producing their own cylinder liners; it is possible that these ventures will develop alternative supplies of high quality cylinder liners.

Effectiveness of the Afridev Supply Chain

Is there a real and sustainable demand for Afridev handpumps in the region?

At the moment, the main demand for Afridev handpumps is from hand-pump programs run by local government, ESAs or NGOs, and there are indications that this demand is reducing. Private sales are currently low, but they have grown rapidly in the last few years, and there is evidence of significant potential demand in Afghanistan, and in certain areas of Pakistan (for example, where the water table is deep and the electricity supply is unreliable).

Is the Afridev supply chain able to meet this demand?

The manufacturers are operating at below full production capacity, which suggests that they are meeting demand. The customer interviews conducted during this study indicate that the limited demand for unsubsidized Afridevs is being met, but that the significant demand for subsidized Afridev handpumps, particularly in Afghanistan, is not. However, recent

increases in the number of traders involved in buying and selling Afridev pumps and parts demonstrate that the supply chain is expanding, and that availability is improving. Interestingly, most of this growth has been in response to local demand, thus the stores stocking Afridev handpumps and parts are not to be found in cities, but in rural centers, and most of their business is not with government or ESAs, but with local NGOs and private customers. Despite this expansion, there is still a shortage of reliable repair services in many areas.

Is the Afridev supply chain meeting the demand effectively?

Unfortunately, it appears that the rise in private sector participation is being undermined by supply chain weaknesses. Reliability problems, often caused by bad installations or low-quality pump components, are affecting private sales. Affordability is also a problem. The heavily subsidized handpump programs have not proved to be a sustainable solution, and have clearly inhibited the private sector. Therefore, reducing the cost of the Afridev handpump, without compromising its quality, remains the major challenge faced by the Afridev supply chain in Pakistan.

Despite these difficulties, there are some indications that the supply chain is becoming more effective:

- awareness of availability and quality is improving among both suppliers and customers;
- manufacturers are starting to introduce branding and to actively promote their products;
- credit is being extended to traders by manufacturers (usually 15 to 20 days);

- traders are increasing the size and content of their Afridev product range; and
- hybrid Afridev handpumps combine the Afridev's technical advantages with increased affordability.

Finally, then, is the Afridev supply chain sustainable?

More than 90 per cent of the existing demand is from the local government and ESAs, and most of the remainder is from local NGOs. This suggests that the public has not yet fully accepted the Afridev handpump as an appropriate or affordable product, and that the industry is still largely dependent on external support. Affordability is the key to the future success of the Afridev handpump, and thus to the sustainability of its supply chain, but even intense competition between manufacturers has not been able to reduce prices by much. However, there has been a growth in private sales following the scaling down of the subsidized handpump programs, and the long-term development requirements of Afghanistan look likely to generate

demand for many years yet. Therefore, it is vital that efforts are made to improve the range of products that the Afridev supply chain provides, and that the ESAs (who invested so much time and money to develop the supply chains), formulate exit strategies that ensure subsequent private sector provision is both affordable and sustainable.

Implications and New Approaches

Diversify product ranges to reduce dependence on ESA orders

There is a huge demand for low-cost handpumps in the region, but local contexts vary considerably, and Afridev handpumps are not always an appropriate option. Most low-income groups consider Afridev handpumps too expensive, and there are insufficient funds for universal subsidies, therefore a 'single product' approach effectively excludes the Afridev manufacturers

from a significant proportion of the potential market. There are valid reasons for a 'standardization approach', especially during the introduction of a new handpump, but insistence on rigid international specifications constrains innovative local enhancements and, in Pakistan, has resulted in the Afridev being considered an expensive foreign product, whose only real customers are aid agencies. An international NGO working in Bangladesh, International Development Enterprises (IDE), has demonstrated that local manufacturers can make more affordable versions of standardized handpumps, such as the Tara and the UNICEF Number 6, by reducing the diameter of the below-ground components and by incorporating local materials into the pumps, and these low-cost pumps are proving very popular. Hybrid Afridev handpumps, and cheap 'local' pumps, offer incremental levels of service that are attractive to low-income groups, and the Afridev manufacturers should be encouraged to use their comparative advantage (experience and resources) to supply this market.

Assist Afridev manufacturers to create and support networks of handpump technicians, including community-based ones

Existing institutional arrangements have resulted in the monopoly of installation and repair services by ineffective 'area' handpump technicians. Manufacturers should be encouraged to break these monopolies and support private installation and repair services. They have numerous incentives: they can increase their market share by providing credit and discounts to traders and technicians



that use their products; they can market their brand through these supply chains, thus improving private sales; and, finally, they have the technical experience and resources to make installation and repair services more efficient, thus improving the reliability and reputation of their products, and generating higher sales. ESAs could assist this process, and prevent the costs being passed on to the customer, by providing subsidized training programs to private manufacturers, traders, technicians and community members. The Afridev is designed to be a 'VLOM' (Village Level Operation and Maintenance) pump, and the skills required to carry out repairs are easily transferred. Even very informal technicians, with support, could provide efficient services to groups of households at low-cost.

Introduce quality assurance certification for Afridev handpumps

At present, most of the ESAs hire quality control specialists to inspect the Afridev handpumps that they purchase. Private customers cannot afford this luxury, and usually do not have sufficient technical expertise to detect any flaws; hence they are often sold the handpumps rejected by the ESAs. Even specialists find it difficult to detect the use of inferior materials, but it is possible to assure quality by having a respected institution provide some form of certification, or marking, to show that the component, or material used, meets relevant national standards. The Afridev manufacturers are already providing a form of quality assurance by putting permanent brands on their products, and ESAs should assist them by investigating the cost and practical-

ity of instituting an appropriate and sustainable certification system.

Microfinance for handpump purchases

Microfinance schemes in NWFP have reportedly achieved 97 per cent recovery on loans for small agricultural projects. The provision of similar 'social collateral' loans to low-income groups may improve the affordability of Afridevs, and thus increase the potential market.

References

MIDAS (1997) 'Draft report on study of handpumps in low water table areas: technology options, marketing and financial arrangements', Dhaka: SDC

Mudgal, A K (1997) 'Indian handpump revolution: challenge and change', HTN working paper WP 01/97

SKAT (1991) 'Proceedings of the handpump meeting in Islamabad: June 1991', St. Gallen: SKAT

SRSC (2000) 'Monthly progress reports, SRSC Kohat region', unpublished

The Dawn (2000) 'Dawn Economic and Business Review, May 1-7, 2000: Need for a new economic paradigm', Lahore: Jang Newspapers

UNICEF (1993) 'Assessment of performance and usage of Afridev handpumps in NWFP', unpublished

Robinson, Andy (2000) Water and Sanitation Program-South Asia (1999) 'Demand or dependency? Afridev handpumps in Pakistan', unpublished

World Bank (2000) 'Country brief: Pakistan', Web site: www.worldbank.org

Prepared by Andy Robinson.

We thank Simon Trace of WaterAid UK for his suggestions and comments.

For more information, contact Clarissa Brocklehurst, Supply Chains Series Co-ordinator for South Asia, at cbrocklehurst@worldbank.org

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

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

20-A Shahrah-e-Jamuriat
G-5/1 Islamabad, Pakistan
Phone: (92-51) 2279641-46
Fax: (92-51) 2826362

Other publications in this series:

1. The Treadle Pump: An NGO Introduces a Low-cost Irrigation Pump to Bangladesh
3. Arsenic Mitigation in West Bengal and Bangladesh
4. 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.