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**International Development Enterprises (IDE):  
The Development and Commercialization of the Treadle Pump in Bangladesh  
A Case of Product Marketing on a Mass Scale**

**By  
Jeanne Downing and Paul Polack**

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## Abstract

This paper uses International Development Enterprises (IDE) Bangladesh program to test the practicality, validity, and usefulness of the performance measurement framework (PMF) developed from a series of conferences sponsored by the Committee of Donor Agencies for Small Enterprise Development, the International Labor Organization (ILO) and USAID.

IDE launched its Marketing Appropriate Technology (MAT) program in 1984 with funding from the Canadian International Development Agency (CIDA) and the Swiss Agency for Development and Cooperation (SDC). Targeting small farmers with an average plot size of 1.25 acres (divided into 5 quarter plots), the program set out to create a new, mass market for affordable small plot irrigation devices. To stimulate demand, IDE used customer-focused marketing techniques, common among the business community but – at the time – uncommon in the development community. IDE refers to its project approach as “market-led product development.”

For the purposes of the PMF, the BDS service associated with the IDE/Bangladesh MAT program is defined as product development and commercialization. In the role of market facilitator, IDE invested donor funds in R&D to further adapting - to the demands of the market - a foot-operated pump, called the treadle pump (TP); in building the capacity of private sector distributors; and in stimulating demand. To stimulate demand, IDE undertook extensive promotional and marketing efforts and leveraged these interventions to create impacts far and beyond directly assisted BDS providers, referred to as market leaders. At the peak of the market, these market leaders made up only 25% of the market, while the remaining 75% consisted of BDS providers only indirectly assisted by the MAT program. Total sales of directly and indirectly assisted providers totaled 1.3 million in 1999.

The PMF market development indicators reveal IDE’s success at creating a vibrant and competitive market. Over time, the number of BDS suppliers has increased, the number of products has increased, the price range for irrigation equipment has broadened, and the price of the TP has declined with greater competition. As a result of increased product and price differentiation, the TP has moved down-market to a larger percentage of the most marginal farmers, living on the smallest segments of land or working as tenant or sharecrop farmers.

The PMF cost-effectiveness indicators indicate the very high level of cost-effectiveness of the IDE/Bangladesh MAT program. A 1999 impact study did an exhaustive assessment of the net income earned by TP owners and found that farmers conservatively earn US \$100 annually on their US \$24 investment in an installed pump. More enterprising farmers earn far more. In a country where per capita income is estimated at US \$220, even the most conservative figure is indeed substantial. The cost benefit ratio of the program was .01 in 1999, due to the enormous aggregate net income benefits as compared against aggregate program costs. The PMF sustainability indicators show that BDS providers are profitable and thus sustainable. However, as IDE begins to exit from the market and withdraw its subsidization of promotional activities, there is some question as to what will happen. Will providers be willing to invest their own funds into marketing? Will they need to, or have past efforts been sufficient to bolster sales?

Impacts on BDS customers have been substantial. As already noted, farmers using the TP easily make US \$100 per year; this is in a country where average per capita income is US \$220. BDS providers improvements in their business practices and TP farmers increase in land-use intensity and productivity in a country that is land poor are further indications of impact.

### 1.0 Introduction

This paper aims to test the practicality, validity, and usefulness of the performance measurement framework (PMF) developed from a series of conferences sponsored by the Committee of Donor Agencies for Small Enterprise Development, the International Labor Organization (ILO)

and USAID. The purpose of the PMF is to assist practitioners, donor agencies, and researchers in measuring the performance of business development services (BDS) programs against a set of common indicators. Some of the PMF indicators, including those measuring sustainability, cost-effectiveness and impact are commonly used in the development community. Others measuring BDS market development are relatively new and reflect a shift in focus in the BDS field from the supply of subsidized services to a limited population to the development of a vibrant BDS market for large numbers of micro-, small-, and/or medium-sized enterprises (MSMEs).

## **2.0 IDE/Bangladesh and the Marketing Appropriate Technology Program**

IDE launched its Marketing Appropriate Technology (MAT) program in 1984 with the goal of improving the welfare of Bangladesh's rural poor by treating them as customers rather than charity cases. IDE aimed to develop and market irrigation equipment that even the smallest farmer could afford and with which he could substantially increase his productivity and income.

The economy of Bangladesh can be characterized as agriculturally dependent. The majority of the population live in the rural areas, where almost half live below the poverty line (reporting year 1988/89, Statistical Yearbook, BBS, 1994). The 1996 World Development Report puts per capita national income at US \$220, making Bangladesh one of the poorest countries in the world. Nearly two-thirds of the population are functionally landless, and agricultural growth is very poor due to limited irrigation facilities.<sup>1</sup> Within this context, IDE/Bangladesh set out to increase farmers' access to irrigation technology through a private sector delivery system.

The Canadian International Development Agency (CIDA) was the primary donor for IDE/Bangladesh's MAT program during the 1980s; in the 1990s the Swiss Agency for Development and Cooperation (SDC) took over this role. The MAT program built upon previous efforts implemented by the Government of Bangladesh (GOB) and an NGO working in the north called Rangpur Dinajpur Rural Service (RDRS), supported by Lutheran World Service. Prior to the GOB program, the extraction of groundwater was done by traditional methods, at one extreme, and motorized pumps, at the other. The GOB program introduced hand tubewells based on the adaptation of the "No. 6 hand pump." Although the pump had been designed for drinking water rather than irrigation and was relatively expensive, within four years 88,000 of these pumps had been sold largely for irrigation. This program demonstrated the demand for manual irrigation equipment.

In the early 1980s, two additional manual pumps became available: the rower pump and the treadle pump (TP). The Mennonite Central Committee (MCC) developed the rower pump and RDRS the TP. In 1982/83, the No. 6 hand pump cost Taka 2,885, the rower pump Taka 1,667, and the TP with a bamboo tubewell<sup>2</sup> Taka 650.

In 1984, when IDE/Bangladesh started up operations, their goal was create a new, mass market – using private sector delivery channels - for affordable small plot irrigation devices. The MAT program targeted small farmers whose average plot size was 1.25 acres, divided into 5 quarter plots. The program addressed the gap between traditional, labor-intensive irrigation devices, at the low end of the market, and the 5HP diesel pump at the high end of the market. To create this new market, IDE used customer-focused marketing techniques, common among the business community but – at the time – uncommon in the development community. IDE refers to its project approach as "market-led product development."

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<sup>1</sup> "Evaluation of IDE/KB Project, Marketing Appropriate Technology in Bangladesh," International Development Enterprises and Krishok Bhandu, A. Kohler et al for Swiss Agency for Development and Cooperation, May/June 1992.

<sup>2</sup> Today, the TP is sold with a PVC tubewell.

### **3.0 Defining the BDS Services, Facilitator and Providers**

#### **3.1 BDS Services and Providers and IDE as Facilitator**

The BDS service associated with the IDE/Bangladesh MAT program could be defined as technology access. However, given IDE's emphasis on marketing as the key innovation of the program, "product development and commercialization" has been selected as the type of BDS provided, with the product defined as irrigation equipment.

As testimony to its forward thinking, IDE/Bangladesh has used the term "facilitator," only recently adopted by the Donor Committee, to describe its role in market-led product development and commercialization since the 1980s. The term facilitator denotes the donor-funded organization whose interventions are aimed at developing the market through targeted investments to direct service providers and overall market expansion. Facilitators, unlike service providers, do not engage in direct service provision but rather in stimulating demand, investing in the capacity of private sector providers, and leveraging interventions to effect market growth.

As facilitator, IDE has invested donor funds or subsidies in R&D to further adapt the TP to the demands of the market; to develop and build the capacity of a private sector distribution system; and to stimulate demand through marketing and promotion. The package of services offered to private BDS providers includes: technology research and development (R&D); technical training to manufacturers in production and quality control; training in marketing to dealers and pump installers; technical training to installers in pump and well installation, and repair and maintenance; business linkage services to manufacturers, dealers and installers; and promotional services, with some cost sharing from dealers.

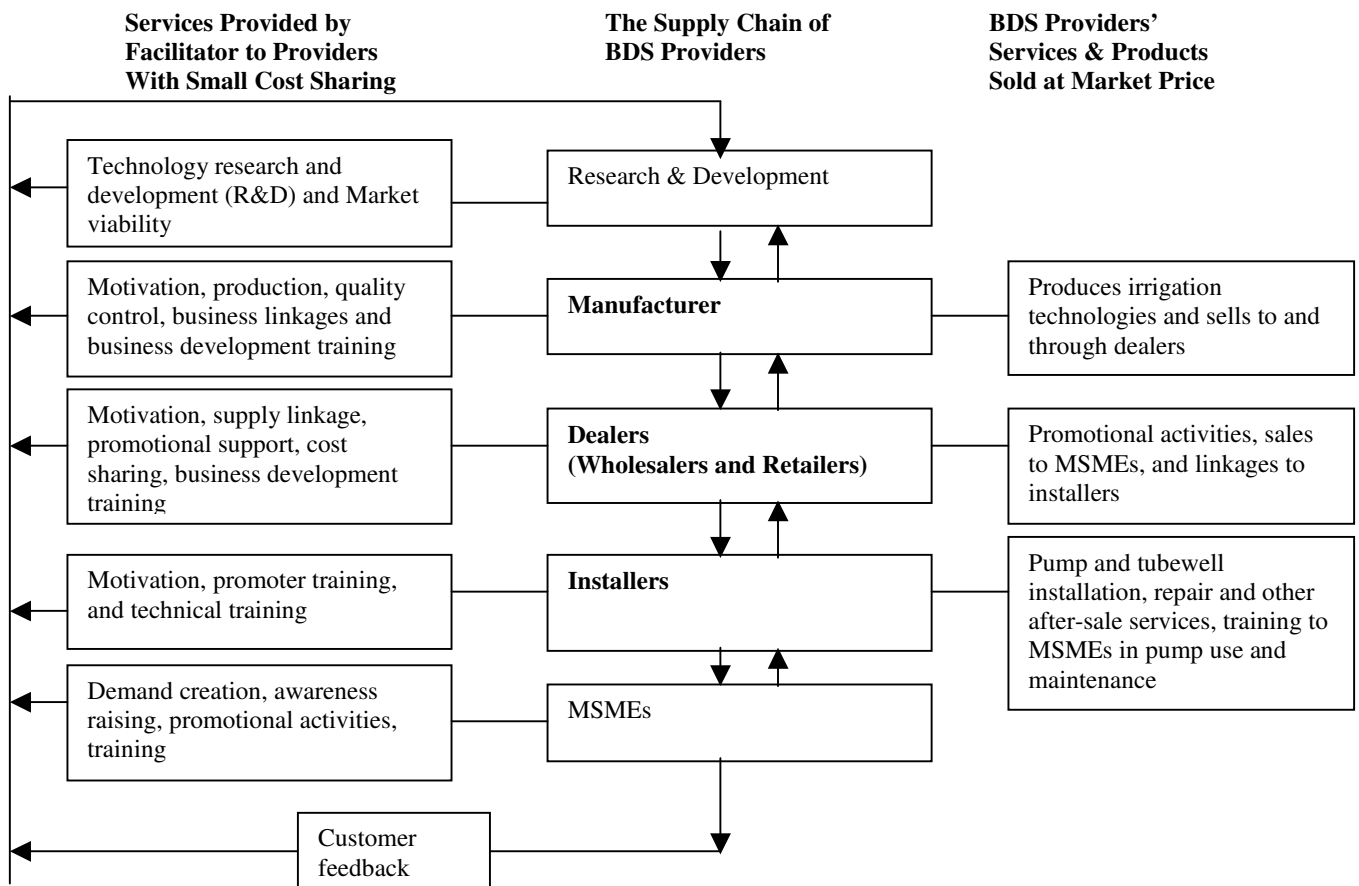
IDE's role in facilitating business linkages has been key to its success in outreach. The private-sector supply chain for producing and distributing TPs and other irrigation equipment includes manufacturers of irrigation equipment, dealers (both wholesalers and retailers), and installers. Prior to IDE's interventions, urban-based manufacturers largely sold their products to wholesalers. Rural-based dealers traveled to Dhaka to purchase inventory from wholesalers for sale to rural customers. IDE changed this business practice by facilitating business linkages between manufacturers and an extensive network of rural-based dealers, thus cutting out the wholesalers.

BDS providers, as defined by the PMF, sell products/services directly to MSMEs at unsubsidized prices. Within the MAT program the manufacturers, dealers, and installers are the providers of BDS. As shown in Figure 1, the manufacturers produce TPs and other irrigation equipment<sup>3</sup>, which they sell through dealers. Dealers stock TPs, PVC pipe and filters, and other irrigation equipment for sale to farmers. Installers bore the well for the farmer, install the PVC pipe and filter and pump, train farmers in pump use, and provide repair and other after-sales services. Small farmers pay dealers the market price for the equipment, and installers a market price for their BDS services.

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<sup>3</sup> Other irrigation equipment includes other manual pumps such as the No. 6 hand pump and, in some instances, PVC pipe and filter for the tubewell and motorized pumps.

**Figure 1: BDS Services, Providers and Facilitator**



Because of linkages among manufacturers, dealers, installers and most importantly the customers, the BDS suppliers are not passive recipients of IDE services. While as facilitator, IDE has made significant interventions to stimulate demand, create order in the market, encourage business linkages, and expand the market through extensive promotional campaigns, the BDS providers assume the costs and risks of producing, selling, and servicing the TPs. Moreover, market information is passed up and down the supply chain from customer to installer, from installer to dealer, and from dealer to manufacturer. The proximity of these BDS providers to the customers they serve and their interdependency allows customer feedback to be integrated into product development and modification. It also ensures that information about product demand is available to all.

IDE provides another service, which is key to new product development. Commonly when a new product is developed in a country that lacks patent laws, which is most if not all developing countries, “copy cats” emerge to take advantage of the new market opportunity. “Copy cats” can have a range of impacts on the market. On the positive side, they can offer customers cheaper, lower-quality products at a lower price, thereby adding to the price distribution available on the market and providing customers with a trade-off between price and quality. If customers are aware of the quality differences, they can choose which quality equipment at which quality best meets their needs. “Copy cats” in Bangladesh provided IDE with an important lesson: customers were willingness to trade off quality for a lower-priced TP. Rather than trying to discourage demand for lower quality, IDE was sufficiently flexible to see this as market information and an opportunity to respond the demonstrated demand for a cheaper product. As a result, three versions of the TP were introduced, with varying quality or durability and price, with the cheapest designed to last about 2 years. Customers were made aware of differences in durability. Over time, this cheaper pump made up 50% of total sales.

On the negative side, some “copy cats” can produce poor quality products that have a detrimental effect on the market. If customers are unaware of the differences in quality, buyers may buy a product of such poor quality that it does not operate properly, if at all. In this scenario, the end result is disappointment on the part of the customer, who spreads the news to his neighbors that the product is not worth buying. This kind of behavior, if it expands too far, can produce a chaotic market in which price, quality, and demand spiral downwards. IDE/Bangladesh intervened to facilitate more order in the market, not to control it but to influence it. The program identified market leaders trained in the importance of quality control, used branding to differentiate high-quality pumps from the low-quality copies, and launched promotional efforts to create awareness among customers about branded, quality TPs. According to IDE, both the branding of the product and educational effort to make customers aware of quality products, while time consuming, are critical to the successful commercialization of a new product. At the same time, IDE learned important lessons from the “copy cats,” and was sufficiently flexible to incorporate these lessons into product design.

As the market for TPs expanded due to increasing number of “copy cats” and market leaders, IDE focused on a market segment that consisted of between 25% and 35% of the total TP market. IDE’s aim was to influence - not control the market - through limited interventions to establish quality standards for manufacturers and customers, expand the market through marketing and promotional activities, and instill good business practices among distributors. To expand the market and promote “good business practices,” IDE trained a larger and more decentralized pool of manufacturers located in rural areas, and linked them with a network of rural-based dealers. While rural manufacturers typically sold through a few dealers, IDE encouraged rural manufacturers to significantly expand the number of dealers they wholesaled to. Manufacturers learned that by adopting this new business practice, they could greatly increase their outreach and sales.

### **3.2 Facilitation Versus Direct Service Provision**

The role of IDE/Bangladesh in TP product development and commercialization has shifted over time. IDE began its product commercialization effort in Bangladesh by exerting considerable control over the market: by selecting manufacturers, setting prices and quality standards, and wholesaling pumps produced by manufacturers to a network of dealers developed by IDE. This early control was needed to stimulate interest on the part of manufacturers, who had little motivation to risk entering a new and untested product market. However, soon it was important to exit from the role of direct service provider.

According to a 1991 publication,<sup>4</sup> the success generated by a quality product, the outreach afforded by the network of dealers, and few irrigation alternatives stimulated other producers – i.e., “copy cats” - to enter the market. These “copy cats” expanded in number to the point that they made up 75% of the market. Their interest in the TP market attested to IDE’s success in stimulating market demand. In essence, IDE’s focus on a relatively small part of the market had leveraged a much larger market of BDS providers and customers. At this point, IDE stepped out of the role of direct service provider and assumed the role of market facilitator. The objective became to improve quality and business practices and develop marketing networks using private dealers. Rather than competing with the private sector, IDE worked to take advantage of the market created and leverage their interventions further. The program began providing marketing and technical assistance to those producers who were interested in opening up new areas or taking over from IDE existing markets.

In the early 1990s, a new strategy emerged from a new IDE project director that included the establishment of a wholesale company, Krishok Bhandu, Ltd. (KB), with the aim of ensuring the sustainability of TP commercialization and quality control. This strategy would again put IDE in the role of direct service provider. SDC provided KB with working capital amounting to US \$100,000 in 1995 to launch the company. However, eventually SDC concluded that establishing a private company with public monies created “conflicts of interest.” IDE again reverted to the role of

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<sup>4</sup> “The Treadle Pump: Manual Irrigation for Small Farmers in Bangladesh,” by Alastair , A.S.M. Nazrul Islam, and Gunnar Barnes. RDRS. July 1991.

facilitator, while KB continued as a separate, private entity staffed by a number of former IDE personnel. Today KB is a company of 59 staff persons with a network of 500 dealers and sufficient revenues to cover operational costs. In 1999, KB sold 11,000 TPs, (and 60,000 No. 6 hand pumps) at the highest in the market. Like any business, KB maintains tight control over its prices, dealers, and producers. While KB has made contributions to the BDS market, its relative lack of success with the TP and its high price for the TP suggests that IDE's facilitative role has been more beneficial to MSMEs. Moreover, the 1999 impact study (T. Shah et al) asserts that used and lower-quality TPs are a thriving part of the market. This finding suggests that KB's strategy of direct service provision – in order to control quality - may not, in fact, reflect the demand of the market.

## **4.0 The PMF BDS Market Development Indicators**

### **4.1 Defining the Market and Market Indicators**

The irrigation equipment market in which IDE intervenes is national in scope and only limited by areas where irrigation is possible. The market segment targeted includes small farmers, with landholdings between .05 and 2.49 acres of land<sup>5</sup> (FAO and BBS, 1989 and 1996 respectively) and some percentage of the landless, who are either tenant farmers or share-croppers.

#### **4.1.1 Expanding the Market for BDS**

The first objective of the Market Development Indicators is to assess program efforts at expanding the market for BDS. The indicators for this objective include market size - both number of MSMEs served and the value of BDS provided - and market penetration. IDE does not collect information on MSMEs served but rather on the number of pumps sold. Some farmers use multiple pumps to irrigate their dispersed plots, and some farmers use one TP on multiple tubewells. Since the TP is mobile, farmers can use one pump on several tubewells, moving the pump from one tubewell to the next to irrigate as many as four plots. Consequently, it is difficult to know to what extent one pump represents one MSME. For the sake of this analysis, products sold are used as a proxy for number of MSMEs served.

IDE collects two sets of data on quantity of sales: sales of BDS providers directly assisted by the MAT program and who are classified as market leaders; and national sales figures that also include sales of providers indirectly assisted by IDE interventions. As many as 75%<sup>6</sup> of all sales accrue to indirectly assisted BDS providers, who benefit from IDE's facilitation in the market, including promotional efforts and new product development. Since IDE's strategy is to facilitate the market through direct assistance (training and advertising) to market leaders, all TP manufacturers are beneficiaries of the MAT program. This strategy has, for the most part, proven to be successful, and it is facilitative.

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<sup>5</sup> The TP is not appropriate for farmers with landholdings ranging from .01 to .05 acres. These farmers represent a significant but still untapped market. .

<sup>6</sup> Alan Sauder, CIDA Evaluation, 1992.

**GOAL 1: OUTREACH (SCALE AND ACCESS)**

**ASSESSING BDS MARKETS**

OBJECTIVE	Indicators						
		Market	Program				
		1998/1999	1989-90	1991/92	1996/97	1998-99	Cumulative
Expanding the Market for BDS	Market Size: Number of SMEs purchasing services <sup>7</sup>	12.5 million <sup>8</sup>	32,906 <b>48,738<sup>9</sup></b>	98,000 <b>133,000</b>	71,302 <b>105,071</b>	31,551 <b>73,557</b>	565,862 <b>1.3 million</b>
	Market Size: Amount of sales by BDS providers*	na	\$855,556 \$1,258,244	\$3,074,510 \$3,737,705	\$2,003,803 \$2,521,704	\$757,224 \$1,765,368	n.a
	Market Penetration: % of potential SME market reached with a BDS		n.a.	n.a.	n.a.	10.4% <sup>10</sup>	n.a
Developing a high quality, diverse, competitive market	Number of BDS providers	n.a.	30 mfgers 620 dealers 2,520 instal	n.a.	n.a.	84 mfgers 962 dealers 2,420 instal	n.a
	Number of BDS service-types		7	n.a.	n.a.	16	
	Well distributed, wide price range for BDS services	50 taka – 6,000 taka \$1 - \$120	1993 study indicates price range for TPs between Tk 350 and Tk 150.				
	Average price for a unit of BDS	n.a	\$9.87 <sup>11</sup> \$26 <sup>12</sup>	n.a	n.a	\$5.60 \$24	n.a
	Number and proportion of multiple-user customers in the market	n.a	n.a	n.a.	n.a.	31%	
	Market Distortion: Average subsidy content	n.a	n.a	n.a	n.a	18.9%	n.a.
Increasing Access to BDS services to under-served groups	Extent of Access: Number and % of SME who represent under-served groups	650,000 landless farmers who irrigate 5% of market	n.a	n.a	n.a	n.a	n.a
	Target Market Penetration: % of potential SME targeted markets	n.a	n.a	n.a	n.a	n.a	n.a

<sup>7</sup> The program market size contains unbolded numbers representing directly-assisted sales and bolded number representing national sales.

<sup>8</sup> Estimated farmers with landholdings between .05 and 2.49 acres using irrigation equipment, based on census data, plus 10% of an estimated 6.5 million landless farmers

<sup>9</sup> Alan Sauder, CIDA evaluation, 1992

<sup>10</sup> This assumes that all pumps sold are still operating, which is unlikely.

<sup>11</sup> This is for a pumphead only.

<sup>12</sup> For an installed pump, including tubewell, PVC pipe and filter

**Figure 2**

<b>IDE Directly Assisted Sales</b>														
<b>Year</b>	<b>1986</b>	<b>1987</b>	<b>1988</b>	<b>1989</b>	<b>1990</b>	<b>1991</b>	<b>1992</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>
Sales	100	15000	29000	48000	32906	35000	98000	24995	27586	38509	58290	71302	55623	31551
Cum	100	15100	44100	92100	125006	160006	258006	283001	310587	349096	407386	478688	534311	565862
<b>National Sales - IDE Directly and Indirectly Assisted Sales</b>														
<b>Year</b>	<b>1986</b>	<b>1987</b>	<b>1988</b>	<b>1989</b>	<b>1990</b>	<b>1991</b>	<b>1992</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>
Sales	23636	36300	48738	70400	48394	65000	133000	160000	93606	185000	110752	105071	92971	73557
Cum	26636	59936	108674	179074	227468	292468	425468	585468	679074	864074	974826	1079897	1172868	1246425

Figure 2 shows annual and cumulative sales of TPs for directly and indirectly assisted BDS providers. IDE estimates that there were approximately 1.3 million TPs in the field at the end of 1999. The numbers in Figure 2 come very close to this estimate. These figures do not, however, include sales of other pumps. In 1999, IDE/Bangladesh reported sales on seven additional products. In the 1980s and early 1990s, data is available on rower pumps, of which a cumulative of 62,000 were sold by 1992.

For the purpose of measuring outreach for the PMF, both the most conservative sales figures reported in Figure 2 for IDE directly assisted sales of TPs, as well as the larger national sales figure are presented in the PMF Market Development Indicators table. Using data from manufacturers on pumps produced suggests that the conservative number is far below the number of pumps being produced. For example, in 1997/98, manufacturers of manual pumps, including several versions of TPs and rower pumps, produced 93,000 pumps. Manufacturer data for 1998/99 is over 73,000 very close to the larger estimate for national sales. In other words, manufacturer data lends credence to the larger numbers estimated by IDE.

Market penetration was calculated using 1999 Bangladesh Bureau of Statistics data for farmers with landholdings between .05 and 2.49 acres using irrigation technologies. These statistics do not include landless farmers and only include the use of shallow tubewells, deep tubewells, low-lifting devices and a category called “manual technologies.” Added to this was a modest figure of 10% of landless farmers to account for tenant and share-cropper farmers using irrigation equipment. The total market size is estimated at 12.5 million. Given the 1.3 million estimate of manual irrigation sold, market penetration is at 10.4%. Clearly, IDE/Bangladesh has had a significant impact on the market for irrigation equipment.

#### **4.1.2 Developing a High-Quality, Vibrant BDS Market**

The second objective under the market development indicators is to develop a high-quality, diverse, competitive market. This objective is measured by: the number of BDS providers, the number of service or product types, the distribution of prices, average price, number of multiple users, and the subsidy content of the BDS service.

In 1999, IDE provided assistance to 84 manufacturers, 962 dealers, and 2,420 installers. In 1989/90, the number of manufacturers was 30, the number of dealers 620, and the number of installers is estimated at 2,520. Over this same period the number of BDS services provided by providers increased from 7 to 16. In 1990, the estimated average price for an installed TP was US \$26; this average fell to US \$24 in 1999, not accounting for depreciation of the dollar. The price range for TPs varies according to the quality or gauge of the sheet metal used to construct the pumphead. A 1993-impact study indicated that less than 5% of sales were at Tk 350, and over 50% of sales were for TPs costing Tk 150 or less, thus suggesting a relatively wide price distribution. The average price range between directly- and non-directly-assisted producers may, in fact, display a greater price range. Used TPs likely represent the low-end of the price distribution, and KB TPs likely represent the high end.

Over time, the average price has varied only marginally. According to IDE/Bangladesh, the price of a TP pumphead (not including the tubewell installation) in 1985 was Tk 325 compared to the price today of Taka 280. During this period the exchange rate rose from Tk 33 = US \$1 to Tk 50 = US \$1. In dollar terms, the price fell from US \$9.87 to US \$5.60 over the period, this does not account for the depreciation in the dollar. At the same time, raw materials costs increased by a reported 200%. Clearly over time real prices have fallen considerably. As new manufacturers and dealers have entered the market, profit margins in the TP supply chain have been squeezed. Manufacturers earn a mere 10-percent margin on each pumphead sold.

<b>Year</b>	<b>BDS Providers</b>	<b>BDS Products/Services</b>
1989/90	30 manufacturers 620 dealers 2,520 installers	(1) TPs, (2) rower pump, (3) No. 6 hand pump, (4) PVC pipe, (5) PVC filter, (6) Installation, (7) repair
1998/88	84 manufacturers 962 dealers 2,420 installers	(1, 2, 3) 3 TP models, (4) Deep-set TP, (5) Plastic TP, (6) No. 6 hand pump, (7) Deep-set hand pump, (8) Mobile pump, (9) Animal-powered pump, (10) Drip system, (11) 3 HP motorized STW, (12) PVC pipe, (13) PVC filter, (14) 1" tubewell, (15) installation, (16) repair

According to an IDE staff person, “in 1986 the TP was a profitable product for everyone in the channel.” Presently manufacturers make about Tk 25 on each pumphead, while dealers make Taka 100 and installers average Taka 250 - 350 depending on the depth of the water table and the hardness of the soil. This Tk 250 is earned by four people working one half day. Because of the low margins earned on the pumphead, dealers make their money on the PVC pipe and filters used to construct tubewells. Even manufacturers carry PVC due to its profitability, and one manufacturer interviewed in Dhaka manufactures PVC pipes and filters.

Within the larger market, there may be tens of thousands of BDS providers involved in the production and distribution of manual irrigation equipment.<sup>13</sup> And while census figures on irrigation equipment manufacturers could not be found, the numbers of providers have surely increased substantially over time as new products have entered the market. The number of BDS products and services related to irrigation range from the traditional swing buckets and doons<sup>14</sup>, to manual devices such as the TP, No. 6 hand pump, and rower pump, to a range of mechanized pumps. Over time, farmers have found innovative and multiple ways to use and combine these devices to create even more options than there are devices.

To illustrate, many farmers buy water from owners of mechanized pumps. Some use a mechanized pump for some crops and the TP for others; some use one TP on multiple plots; and still others, the poorest, use traditional swing buckets or doons or even a used TP. The 3HP Chinese single shallow tubewell (STW) has been added to the mechanized options, which also include German-, Indian-, and Japanese-made deep- and shallow tubewells. “A (Chinese) STW set can be utilized for irrigating dispersed plots by constructing a number of boreholes at different points. The STW machine can be shifted to these boreholes to irrigate dispersed plots. Introduction of polythene pipe (PVC) is another innovation helping farmers to irrigate distant plots from a single STW set. At the moment, the large and medium sized farmers are using TPs for seed-bed preparation before the onset of the monsoons. The TP-irrigation has made it possible to make a transition to more productive STW-based technology.”<sup>15</sup>

As the number of irrigation options available to farmers has increased, the price range for irrigation-related BDS has become more “well distributed.” While the real price of the TP has declined significantly over time, the Chinese STW offers mechanized irrigation at a price that represents a 90% reduction in price as compared to what was previously available.

<sup>13</sup> Krishok Bhandu, itself a manufacturer and wholesaler, has a network of 500 dealers.

<sup>14</sup> Doons are hollowed out logs that look something like a canoe. The doon pivots on a fulcrum point, collecting water on the downswing and emptying as the opposite end downswings.

<sup>15</sup> “Socio-Economic Impact of Treadle Pump Irrigation in Bangladesh,” by Dr. Mahmudul Alam, Dr. Khondakar Mokaddem Hossain, and Dr. M. Salimullah, Bangladesh Institute of Development Studies, December 1999.

<b>Irrigation Options for Small Farmers</b>	<b>Prices</b>
Swing basket	Tk 100
Doon	Tk 500 - 750
TP (installed)	Tk 1,000 – 1,300
Renting water	Tk 1,800 to 3,000 per acre (fuel included) Tk 1,200 to 1,800 per acre (fuel not included)
Chinese 3HP STW	Tk 6,000
Japanese STW	Tk 50,000 – 75,000 though these prices are falling

### 4.1.3 Signs of Market Development

The PMF market development indicators reveal a vibrant and competitive market. Over time, the number of BDS suppliers has increased, the number of products has increased, the price range for irrigation equipment has broadened, and the price of the TP has declined with greater competition. What is striking, however, is the entry of new products and new providers into the market. The Chinese 3HP STW is “causing a revolution in the market,” according to a number of BDS providers. In 1992/93, the TP caused just such a revolution. The peak sales year for the TP was 1992/93, and another smaller surge in sales was experienced in 1997/98. Nonetheless, the longer-term trend has been downward. According to one evaluator: “There has been a significant fall in the yearly adoption rate (number of TPs installed) in the last 5 to 6 years. Farmers have switched to STW irrigation techniques. Even marginal farmers are buying water from the STW owners instead of operating their TPs. Why? Farmers wanted to free themselves from the drudgery of TP-pedaling labor. Additionally, the STW-irrigation set has become more easily available (due to the state policy of de-control) and drastically cheaper. Previously, in the late 1980s, a farmer could buy an Yanmar Japanese STW set at a price of Tk 16,500 through the state-owned Bangladesh Krishi Bank (BKB). In the 1990s, any farmer could buy a 3HP Chinese STW at a price of roughly Tk 6,000/. Farmers are now buying smaller STWs in increasing numbers.”<sup>16</sup>

IDE views the declining sales trend as a normal part of a product cycle. Underlying this declining demand, however, is a much more vibrant, high-quality, and competitive market than existed in earlier years. Of greatest importance is the relatively newly available Chinese 3HP STW at a cost of US \$120. Farmers able to purchase this pump can sell irrigation services to other farmers as well as irrigate their own plots. Thus potential TP owners can buy water from STW owners to save the cost and/or opportunity costs of labor. All manufacturers interviewed concurred that the Chinese 3 HP STW contributed to the declining TP sales. These manufacturers do not believe that the market for TP will disappear, but sales may not reach previous levels.

A question raised by a number of impact studies is whether the TP has contributed to the vibrancy of the market, and perhaps to the affordability of its greatest competitor the Chinese-STW pump. The 1999 social impact study suggests that the TP allowed farmers to increase their income and move up to a more labor-saving device, the STW. A number of manufacturers stated that they do not think that farmers are necessarily switching, but rather that the greater number of options in the market make the TP only one option out of many. While IDE may not have set market development, defining the market broadly beyond the TP, as a goal, it may have done just that. In the midst of the growing competition in the market, IDE is now exploring options for importing and marketing 2HP and .5HP diesel pumps to fill the gap between the TP and the 3HP Chinese STW.

<sup>16</sup> “Socio-Economic Impact of Treadle Pump Irrigation in Bangladesh,” by Dr. Mahmudul Alam, Dr. Khondakar Mokaddem Hossain, and Dr. M. Salimullah, Bangladesh Institute of Development Studies, December 1999.

#### 4.1.4 Outreach to the Under-Served

With increased product and price differentiation in the marketplace, the TP has moved down-market to a larger percentage of the most marginal farmers, living on the smallest segments of land or working as tenant or sharecrop farmers. While IDE does not collect data on size of landholdings (as a proxy for level of poverty) of TP owners, a 1999 social impact study<sup>14</sup> found – based on limited interviews - that early adopters of TPs are not among the poorest. First-generation adopters tend to be the less poor, and over time, the poorer tend to “join in” and the less poor move on to mechanized pumps. Impact assessments indicate that the large majority of TP users are now the small farmer, and that over time the poorer farmers, with landholdings over .05 acres are adopting the TP.

The impact of the TP on women is complicated. Impact studies have documented that the introduction of the TP has increased the intensity of land use, and thus required more labor inputs. Prior to the TP, women did not work in the fields but only in their homes. In many households that irrigate with the TP, women are now a significant source of labor in the field. Interviews with women indicate that they do benefit from higher household income. Although they do not control the use of this income, women do – according to impact studies – share more in the decision-making regarding expenditures as a result of their labor contributions. These studies did not document the effect of this added labor responsibility on women’s time constraints or on the welfare of their children.

#### 4.1.4 Methodological Challenges in Using the Market Development Indicators

Before discussing the methodological challenges with using the PMF indicators, it is clear that using these indicators do lead to an analysis of the program that most studies have not addressed, i.e. BDS market development. That said, there are challenges in using the indicators. **Measuring outreach or scale** is a methodological challenge for any program that successfully facilitates market development for private BDS providers. Once the scale of outreach grows beyond a certain level, as it has in the case of IDE/Bangladesh’s program, accurately monitoring sales among thousands of private producers who do not receive subsidies from the project is difficult. If IDE wants accurate and credible measures of outreach, monitoring the number of BDS providers may be worth the investment. Moreover, they may be the best source of sales data.

Data on the **distribution of price of BDS** clearly shows a progressively more well-distributed price range at the market level. At the program level, “copy cats” played a role of facilitating greater price variation, and IDE took up the challenge by introducing TPs of varying quality, as discussed above. Prices among the private producers only indirectly assisted by IDE may be lower and more variable than prices charged by indirectly assisted manufacturers. Is this good or bad? Is a wide price range always indicative of market development? Certainly at the market level it is, but for a particular product, like the TP, it indicates variations in quality. When variations in quality and price provide customers with the ability to choose the price-quality combination that best suites their needs and income levels, price and quality variation contribute to the vibrancy of the market. However, very poor quality products - that are so poor that they do not function or last but for a very short period of time work – can undermine market development.

IDE has very limited data on **multiple-use customers**. Although impact studies verify that multiple-use customers are relatively common, and IDE has an estimate made at 31% for 1999, this information is not systematically collected by the IDE “Monitoring & Evaluation Department.” In the case of technology products, multiple use may indicate the quality of BDS in the market, depending on the “shelf-life” of the product. However, level of sales over time is probably more indicative of quality and easier to collect.

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<sup>14</sup> “Pedal Pump and the Poor: Social Impact of A Manual Irrigation Technology in South Asia,” by F. Shah, M. Alam, M.D. Kumar, R.R. Nagar, and M. Singh. 1999.

IDE does not subsidize equipment sales or any other transaction between providers and customers. IDE does, however, subsidize promotion, training, and new product development for its market leaders; other providers producing irrigation equipment benefit from indirectly. The average **subsidy content** per installed TP in 1998, including headquarter costs, was US \$5.60 for a \$24 installed pump, or 18.9%. At the early stages of product development, the subsidy content was higher and has declined over time. IDE is in the process of phasing out in certain areas of the country, and thus withdrawing assistance. The effect of this phase-out on IDE-assisted producers and dealers, especially in terms of the removal of promotional activities, will be telling. Can these producers maintain their earnings and their market leadership without IDE support? Moreover, manufacturers interviewed are looking to IDE to continue to develop new products. IDE contends that product development can be justified as a “public good” and thus appropriate for donor investments..

IDE’s entire program strategy is aimed at identifying and developing products that are affordable to the poor. IDE argues that because the TP is only appropriate for small landholdings that TP users are self selecting, and therefore assumes that all of the MSMEs that own and/or operate TPs are “**under-served.**” Impact studies have demonstrated that the vast majority of MSMEs served are poor microenterpreneurs; but that a range of farmers – from medium sized to the landless - use TPs. Over time, however, TPs have become increasing within the reach of the most disadvantaged. Nonetheless, IDE does not collect data on the number or percentage of clients that fall within the target group of small farmers with landholdings between .05 and 2.49 acres, or the percentage of users that are women or landless. This data would be useful for market segmentation and documenting impacts on the very poor. .

## 5.0 BDS Supplier Indicators

GOAL 2: SUSTAINABILITY AND COST-EFFECTIVENESS ASSESSING BDS SUPPLIERS				
OBJECTIVE		Indicators		
		Market	Program	
			1989-90	1998-99
Supplier Sustainability	BDS Supplier cost-recovery of operational costs from client fees*	100%	125%	110%
Program cost-effectiveness	Simplified Cost-benefit assessment comparing total program costs to aggregate program benefits for entrepreneurs	n.a.	<u>Cost/Benefit</u> IDE direct + indirect = .03 <sup>17</sup>  ROI = 5,407% <sup>18</sup>	<u>Cost/Benefit</u> IDE direct = .14 IDE direct + indirect = .01 <sup>19</sup>
	Total Program costs	n.a.	\$1,957,365 <sup>20</sup>	\$8,000,000
	Total program cost per customer served*	n.a.	IDE Direct = \$ 15.66 IDE direct + indirect = \$ 8.61	IDE Direct = \$ 14.14 IDE direct + indirect = \$ 6.15
	Total program cost per supplier assisted*	n.a.	\$617	\$2,308
	Total program cost per increase in supplier revenue	n.a.	IDE-direct = 1.61 IDE direct + indirect = .88	IDE-direct = 1.35 – 1.08 IDE direct + indirect = 59 -- .47

<sup>17</sup> Sauder, 1992. The indirect and direct descriptors refer to customers of directly and indirectly assisted providers.

<sup>18</sup> “Evaluation of Marketing Appropriate Technology Phase II,” by Alan Sauder, MEDA Consulting Group, October 1992.

<sup>19</sup> Based on 1998 numbers.

<sup>20</sup> Sauder, 1992

### 5.1 BDS Supplier Sustainability

The profit margins earned by BDS providers in the TP supply chain cover operational costs. The margins charged for an installed pump (including tubewell and polythene (PVC) pipe and filter) are very low especially for the pumphead and for manufacturers. IDE states that the margins were considerably higher in the 1980s, but as the real cost of producing the pumphead increased in the 1990s, final prices changed only marginally. Rather than increasing nominal prices to the consumer, it appears that the BDS providers assumed the increased cost of production. Interviews suggest that to make up for the low margin on the pump, both manufacturers and dealers have entered the PVC pipe and filter market, where they earn larger margins. Competition in the market has pressured producers to keep prices low.

BDS Provider	Average Margin
Manufacturer	Tk 25
Dealer	Tk 100
Installers	Tk 250

### 5.2 Program Cost-Effectiveness

The cost/benefit ratios indicate the very high level of cost-effectiveness of the IDE/Bangladesh MAT program. The 1992 CIDA evaluation incorporates net income to providers and MSMEs, and thus more accurately accounts for benefits. This evaluation also includes sales by providers assisted both directly and indirectly. The 1998/99 cost/benefit ratio only includes benefits to MSMEs, leaving out income generated by providers. In other words, the 1990 ratio is not comparable to the 1999 ratio. Nonetheless, both indicate a high level of cost effectiveness. A 1999 impact study did an exhaustive assessment of the net income earned by TP owners and found that farmers conservatively earn US \$100 annually. More enterprising farmers earn far more than this<sup>21</sup> In a country where per capita income is estimated at US \$220, even the most conservative figure is indeed substantial.

The cost per customer, cost per BDS provider, and cost per dollar increase in provider revenue are perhaps easier to calculate than the cost/benefit ratio but leave out the enormous financial benefit gained by customers. The cost per BDS provider in this case is somewhat spurious, since the number of providers is an annual rather than a cumulative figure, as costs are. IDE does not collect cumulative data on providers assisted. Nonetheless, most measures provide evidence of increased cost-effectiveness. Moreover, data on aggregate program costs as compared to provider revenues shows declining ratio between 1989/90 and 1998/99. This evidence further suggests something questionable about the total costs to supplier ratio, unless each provider has substantially increased their revenues over the time period.

### 5.3 Methodological Challenges in Using BDS Supplier Indicators

The measure for **cost recovery** includes “operational costs.” A methodological dilemma relates to what should and should not be included in this definition of “operational costs.” For example, should promotion be included as an operational cost for BDS providers, or can it justifiably be subsidized? Or can it be justifiably subsidized in the short-run but not the long run? IDE, along with other product developers, argues that subsidizing promotion and marketing can be justified in the early stages of product development. The difficulty comes in deciding when and how these subsidies should be removed. Threshold points need to be identified for market takeoff and based on sales volumes of those in the supply chain. Thresholds for BDS suppliers will vary by region, depending on spatial or geographic variation in the level of market penetration. Still deciding what these threshold points are is theoretical and requires market testing.

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<sup>21</sup> For the purposes of the PMF, the more conservative figure of US \$100 was used

IDE/Bangladesh is beginning a process of exiting from the market. The real question regarding sustainability is whether BDS providers can and/or will be able to at least maintain reasonable and/or replacement-level sales of TP sales without IDE investments in promotion. The current strategy for sustaining promotional activities is to create associations of BDS providers to collect fees and engage in collective promotional efforts. This suggests the importance that IDE places on promotion, and the need for a deliberate exit strategy from subsidizing this important function. Thus in calculating both subsidy content and cost recovery, it makes sense to include promotional costs. Doing so encourages practitioners to develop an exit plan to transfer these costs to BDS providers.

As noted earlier, the **cost/benefit indicator** only includes the financial benefits to MSME customers and not those of BDS providers. And yet the full costs of the program, that include services to providers, are compared to only a portion of all benefits. **Costs per provider** may be misleading in the assessment of the IDE program, since cumulative data is not collected on providers. However, if providers substantially increase their sales as a result of higher productivity, then cost per provider could increase over time, while costs per revenue of increase declines.

## 6.0 BDS Customer Indicators

### 6.1 Increased Acquisition of BDS

IDE does not systematically collect data on customer satisfaction or repeat customers but rather relies on the information flow between customers and BDS providers in the supply chain for this type of information. IDE did provide data on repeat customers for 1999, and the 1990 number was culled from a 1991 publication, which did not state the methodology for the ascertaining repeat customers.

<b>GOAL 3: IMPACT</b>				
<b>ASSESSING BDS CUSTOMERS, MSMEs</b>				
<b>Objective</b>		<b>Indicators</b>		
		Market	Program	
			1989-90	1998-99
Increase customer acquisition of BDS	Customer satisfaction with a BDS	n.a.	n.a.	n.a.
	Repeat customers (percent of customers that buy more than once)	n.a.	18% <sup>22</sup>	31%
Increase customer use of BDS	Percent of customers who improve business practices, as defined by the supplier	n.a.	n.a.	n.a.
Increase customer benefits from BDS	Change in Value-added (Sales-Raw materials)	n.a.	<b>Value added per customer in 1990:</b> \$120-400 per crop per hectare <sup>23</sup>  <b>IDE direct + indirect cumulative value added:</b> \$24,637,560 <sup>24</sup>	<b>Value added per customer in 1999:</b> \$100 <sup>25</sup> <b>IDE direct cumulative value added:</b> \$56,586,200 <b>IDE direct + indirect cumulative value added:</b> \$130,000,000

<sup>22</sup> Orr et al, 1991 p. 37.

<sup>23</sup> Orr et al, 1991.

## **6.2 Increase Use of BDS**

While IDE has had a significant impact on business practices of BDS providers, data for this indicator was not available. As stated earlier, IDE has changed the way many manufacturers and dealers sell their products by introducing them to marketing concepts and – for manufacturers - to the advantages of selling through large numbers of dealers. By out-sourcing their sales function to dealers and concentrating on production functions, manufacturers have been able to improve their efficiency and greatly increase their outreach. Dealers, on the other hand, have improved their efficiency by using promotional activities to increase sales, though – for the most part – these promotional activities have been subsidized by IDE.

For customers or MSMEs, change in business practice – as indicated by change in cropping patterns - has also been widespread. According to a 1991 study<sup>26</sup> comparing TP adopters and non-adopters, TP adopters show a relatively more productive cropping pattern than non-adopters. For example TP adopters sampled for this study demonstrate a crop intensity that is 10% greater than non-adopters. A 1994 study<sup>27</sup> states that TP adopters grow more profitable crops – i.e. vegetables – than non-TP users. According to the 1999 impact survey,<sup>28</sup> “treadle pump irrigation’s most significant impact is probably through its impact on crop yields. This study compared differences in yields for TP owners, diesel pump owners, and “pumpless” smallholders and for different crops. TP owners’ yields were consistently greater than those of pumpless farmers; and in some regions and for some crops yields for TP owners exceeded those of diesel pump owners. TP owners were particularly successful with vegetable crops, out-competing diesel pump owners. A 1995 study in India confirmed the 1991 study in Bangladesh indicating that “while the treadle pump’s beneficial impact varies by region, the central benefit of TP adopters is a significantly higher land-use intensity compared to both diesel-pump owners and those who buy water from diesel pump owners. However, since IDE does not collect systematic data on this indicator and impact studies generally compare TP users with non-users, no percentage was given for “percent of customers who improve business practices” indicator.

## **6.3 Increased Customer Benefits from BDS**

As stated earlier, the 1999 estimate for average net income earned by TP owners is US \$100. This average is proffered by IDE and confirmed by the 1999 impact study. A 1999 study in Nepal shows that for nearly 40% of adopters net income increases due to the TP range from US \$50-70, for another 40% it is in the range of US \$70-110, and for another 20% enterprising adopters it is in excess of US \$110. This pattern was also found in Bangladesh and India (T. Shah, 1999). It seems that household-level income takes two forms: less enterprising poor who use it to bring surplus family labor under productive use (including women); and more enterprising poor who use the TP to transition from subsistence farming to commercial farming. One of these “enterprising TP owners in Bangladesh grossed US \$1,600, invested US \$350 in inputs, and some 400 person days of labor.”

## **6.4 Challenges in Using BDS Customer Indicators**

For the most part the BDS customer indicators are straightforward with the exception of “change in business practice.” This is a subjective and/or qualitative measure that is more accurately reflected in value added. If a change in business practice does not contribute to increased value added then it was not

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<sup>24</sup> Sauder, 1992 (Shown in US dollars).

<sup>25</sup> “Pedal Pump and the Poor: Social Impact of A Manual Irrigation Technology in South Asia,” T. Shah, M Alam, M.D. Kumar, R.K. Nagar, and M. Singh.

<sup>26</sup> M. Alam and M. Salimullah, September 1991.

<sup>27</sup> “Treadle Pump and Small Farmers: A Co-operation for Self Sufficiency,” by Tahmina Haque, University of Dhaka, December 1994.

<sup>28</sup> T. Shah et al, 1999.

a beneficial change, though such a change might take time to show up in increased value added or profit. In addition, this data on “percentage change in business practice” was not collected by IDE and would be difficult to collect due to the massive numbers of customers. On the other hand, SDC commissioned an extensive study to assess value added based on a sample of TP users in Bangladesh. Data on value added is somewhat easier to assess since it is not a percentage and therefore does not require knowledge of the enormous population of customers.

## 7.0 Implications for Best Practices

The IDE program provides a historical view at product development and commercialization offered by few BDS programs. It has also reached a level of scale and outreach achieved by few. As such, it offers an opportunity to explore conceptual ideas about BDS market development, which by its nature requires a long time horizon. Among the lessons for best practices provided by IDE’s experience are:

- **Facilitation results in market development over the long run and higher impacts for MSMEs**  
IDE’s experience as both facilitator and direct service provider offers lessons about the strengths and weakness of practitioners taking these different roles. While there is still debate, certainly at KB, about this topic, IDE – in the mind of the author – has had a greater impact on MSMEs and the BDS market as facilitator than as direct service provider. At the same time, IDE’s experience raises some questions about this debate between facilitator and direct provider role – that is very central to the way many practitioners operate in the BDS field. Many practitioners engage in direct service provision. Some have – like KB – established private companies to act as BDS providers. Is direct service provision always a bad thing? Are there instances, where where direct service provision can be justified as long as the impact on the market is positive and the facilitator has a clear exit plan?

IDE argues that direct service provision can be necessary when introducing a new product to the market. At this point, there are likely few, if any, producers willing to assume the risk of a new and untested product. The more revolutionary the product – as compared to other products on the market – the greater the risk for BDS providers. Thus at the initial stages of product development, IDE believes that direct service provision is justified, but “we need to define the circumstances in which direct service provision is useful, for instance, as a means of stimulating production in the marketplace.” At the same time, clear definitions of an exit point are required.

- **Marketing and promotion are key to expanding markets.**  
IDE attributes much of its success in reaching scale to marketing and promotion. As facilitators, practitioners can use marketing techniques to increase customers awareness of a product and BDS providers marketing skills. IDE’s marketing efforts included very hands-on interventions by “customer service officers” or sales agents that worked in the villages to demonstrate the new product and sell. Once sales reached a threshold level of volume in a region and BDS providers reached a threshold of profitability, IDE exited, turning over the sales function to BDS providers
- **As facilitator, practitioners should promote order in the market to prevent a downward spiral of quality, price, and market demand.**  
At the beginning stages of new product commercialization, IDE posits that facilitators should exert pressure on the market to create order, particularly when and if “copy cats” have a destructive impact on the market. If “copy cats” cause a downward spiral that destroys efforts to stimulate demand, facilitators need to use educational and promotional efforts coupled with assistance to market leaders to counteract market chaos and instill market order.

- **As facilitator, practitioners should support market leaders that lead by setting proper business practices and by establishing quality – against which everyone else in the market is measured**  
 Support to market leaders can be in the form of advertising, training in marketing and quality control, and business linkages to achieve outreach. These market leaders can be instrumental in stimulating demand for a product. However, facilitators need to be aware that too much control for too long can also dampen demand. Customers should be able to choose the price-quality combination that best meets their needs.
- **Let the market decide how much quality for how much price.**  
 The 1999 impact study (T. Shah et al) argues that IDE’s strategy in India that includes tight control over the market for the purposes of maintaining strict quality control may, in fact, hamper the growth in sales. This study hypothesizes that customers are more responsive to price than quality, and uses evidence from a 1993 study showing that the bulk of the buying in 1993 was in used and lower-quality TPs selling significantly below the price of higher-quality TPs. On the other hand, IDE along with a number of manufacturers maintain that quality is important, and thus IDE has taken the position of supporting market leaders, who set the bar for quality. Perhaps there is a middle ground, where the quality is good enough and price is low enough to attract more buyers than a very high-quality product. KB’s and IDE/India’s strategy of maintaining control over the market may, in fact, dampen this negotiation between price and quality, which allows customer to decide how much quality they are willing to sacrifice for price.
- **As market facilitators, practitioners should work with a number of BDS providers to achieve leverage over the market.**  
 In the early stages of product development, practitioners should work with diverse manufacturers so as not to create a monopoly or dampen competition, on the one side, and to exert leverage over price and quality, on the other.
- **As facilitator, practitioners should gauge how many BDS providers the market can support**  
 If facilitators work with too many providers, there may not be sufficient profit to make the product sufficiently profitable and attractive for any one provider. The end result is that providers will not invest in the product. At the same time, IDE notes that “practitioners are not good judges of how many BDS providers the market can support. Practitioners can stimulate the market, and in some instances shape the market, but a truly vibrant market is not controllable by facilitators or anyone else. For example, a carefully targeted marketing and promotion campaign can stimulate sales. And if one producer in a remote area starts to charge three times what the facilitator feels is a fair market price, the facilitator can encourage the emergence of a competitor willing to enter the market at a more reasonable price. This is an example of shaping the market, but even in this example, if the facilitator is wrong, and there is a hidden cogent reason for a higher price in this specific area, the competitor will fail.
- **Facilitation is not a silver bullet for BDS market development.**  
 While IDE’s experience suggests the wisdom of facilitating rather than providing services directly, IDE staff asserted that facilitation is not a silver bullet to best practices. Market facilitation requires substantial skill that may be more art than science. Knowing when to exert control over the market – so as to prevent “a downward spiral” in quality, price, and demand, and when to exit from control to allow the market to develop on its own requires excellent business acumen.

- **To achieve massive scale requires a product for which there is large-scale demand, meaning that the product fulfills a critical need and is affordable, locally serviceable, simple to operate, and culturally acceptable.**

Most practitioners involved in product development and commercialization agree that affordability is important, but what is affordable? IDE defined the term “affordable” as follows: the product should cost no more than 10% of the annual income of the target group and must be able to pay for itself very quickly. It was suggested that microentrepreneurs should be able to double their investment within one year.

- **Marketing and promotion are key to expanding markets.**

IDE utilizes marketing techniques to create customer awareness, interest, desire, and action (AIDA), with action translating into sales. A key finding from the IDE program is the importance of selling, not sales, but actually proactive selling on the part of IDE “customer service officers” at the initial stages of product commercialization in a particular geographic area. This is particularly important with new products and poor customers, who need convincing that a product is worth buying. A strong customer focus is central to effective marketing. Such a focus maintained over time requires flexibility and response to customer demands.

- **In the long run, should the costs of promotional activities be borne by BDS providers?**

SDC argues that subsidizing promotional activities can be justified, since microenterprises cannot be expected to afford these costs. This argument makes a lot of sense at the initial stages of product development. Promotional activities are educational, awareness building, and thus could be considered a “public good.” But if promotional activities are important to maintaining MSME sales, in the long run, BDS providers will have to pay for them.

IDE argues that a marketing and promotion subsidy is justifiable only to the point that each player in the supply chain has sufficient sales volume to cross the profitability threshold. When this is achieved, a carefully timed phase-out of the subsidy should be initiated. This phase-out should be region specific, and ultimately national. A second key criterion for phasing out the marketing subsidy is when sufficient sales volume is reached in a specific region to pass the sales takeoff point.

A question raised with the IDE program in Bangladesh, however, is can providers afford promotional costs when the margins are so low due to high competition? Will providers have to raise prices in order to afford the added cost of promotion? Do they need IDE’s assistance as market facilitator to do this?

- **Flexibility and openness to learning from the marketplace is key to successful product marketing.**

Project documents tend to provide what is often a rigid project plan. Yet, when working with the private sector, unexpected things happen. Practitioners need to be opportunistic about unexpected events. To illustrate, IDE discovered important lessons from “copy cats.” While some had a negative impact on the market, the lower quality pumps offered by “copy cats” at lower prices taught IDE that customers were willing to make trade-offs, and they provided important information about how much quality customers were willing to trade for a lower price.

- **An exit strategy is important from the beginning.**

Fifteen years ago, when the MAT program was launched, IDE understood that exiting would eventually be required. However, a clear and articulated plan for exit was never developed. In fact, conflict between project staff and the donor about appropriate exit strategies led to the development of two concurrent ones: KB developing as a business, and the IDE continuing its work, but

withdrawing from direct service provision. An exit strategy is itself an experiment that requires time and planning. IDE is still in the midst of this process, over a decade into the project.

## 8.0 Implications for Donor Interventions

- **Investment in the development and commercialization of products for the poor requires a long time horizon.**

IDE's facilitation of the BDS market for irrigation equipment targeted to the poor has required a 15 years. While 15 years is a long time for any donor, the pay-off for SDC and the impact on MSMEs has been substantial as indicated by the cost benefit assessment. As facilitator, IDE has changed business practices of providers, introducing them to advantages of working through a network of dealers and to marketing techniques for stimulating demand. The introduction of TPs to the MSMEs has had a significant impact on cropping patterns and intensity and farmer incomes. And while the market for TPs may be waning, the impact on farmers has expanded. As a result of higher incomes, some farmers have been able to adopt even more labor-saving options for irrigating.

- **Donors should invest in creating new markets for products that help the poorest farmer graduate to a higher level of income and productivity.**

In many developing countries, the poor rely on traditional technologies – existent for hundreds of years - for adding value to primary products. In many instances, the next least expensive option is far outside the reach of the poor. Donors should invest in developing intermediate products that allow the poor to move up the income ladder.

Additionally, the BDS market development paradigm advocates facilitating the provision of a range of services to existing MSMEs that operate in existing markets. But these markets rarely serve the needs of the forgotten majority in developing countries, the hundreds of millions of poor people who are bypassed by existing markets. The fact is that there are huge chasms in existing markets for private sector products and services that serve poor people as customers. Providing services only to existing microenterprises serves to perpetuate this gap. It also misses a remarkable opportunity to create hundreds of thousands of new microenterprises that could spring into being to produce, distribute, market and install the key multiple impact products capable of creating new markets for poor customers. These new enterprises, in turn, require the provision of business development services.

- **Donors should subsidize R&D to develop products targeted to the poor in productive sectors.**

In the past, donors spent substantial money on product development with little success. In many instances, product development was driven by engineers rather than by the market. The customer needs to be at the forefront of the product development process. IDE uses a nine-step process that is not very different from what many organizations use, though perhaps in practice it is. Nonetheless, the IDE experience makes clear that “affordable” is often a much lower price than many practitioners are willing to accept.