

2.4 Billion Customers

How Business Can Scale Solutions to Poverty

Grameen Bank has loaned US\$6.38 billion to 7.4 million very poor borrowers, and International Development Enterprises (IDE) has helped three million very poor small-holder families increase their net income by \$288 million per year by creating affordable irrigation tools and markets. In light of growing evidence that most development projects fail to produce measurable positive results, what these programs have achieved seems, at first blush, extraordinary. But approximately one billion people in the world survive on less than \$1 a day, and over 2.4 billion live on less than \$2.¹ So, what Grameen Bank and IDE have done to improve the lives of some 10 million very poor families amounts to nothing more than a drop in the bucket. Achieving positive, measurable change at significant scale remains the single biggest challenge in development.

Many reasons have been offered to explain why the appropriate technology movement, in particular, failed to fulfill its promise of alleviating poverty; the most important among them are the failure to build technology that meets users' needs, lack of local ownership, and complicated and expensive replacement parts. But these explanations, while true, bypass the underlying reality that the movement

Dr. Paul Polak is the founder of International Development Enterprises (IDE) and D-REV, both non-profits, along with for-profit Windhorse International, all of which develop products to serve poor customers. For the past 25 years, Paul has worked with thousands of farmers around the world to help design and produce low-cost income-generating products which have already moved 17 million people out of poverty.

Peggy Reid joined the Lemelson Foundation as Program Director in 2008. From 2001 to 2008, she served as Director of the Public Management Program at Stanford's Graduate School of Business. Her private-sector experience spans product development, management consulting, and mergers and acquisitions. She holds graduate degrees in Business and Theology from Dartmouth and Harvard, respectively, and a B.A. from Wellesley College.

Amy Schefer, Paul Polak's daughter, provided extensive editorial support for this article. She has also been collaborating with Dr. Polak on a blog that will appear on PaulPolak.com.

Paul Polak's first-hand narrative is presented in italics.

was led by well-intentioned, creative tinkerers designing solutions to technical problems, instead of hard-nosed entrepreneurs designing scalable business models around a technology.

Paul: *On a plane 20 years ago, I sat next to a young man who was very excited about a tool carrier he was designing. If a farmer had a plow, a cultivator, and a cart pulled by a draft animal, this tool carrier would let him combine all three in a single platform, to which he could bolt various implements. I liked his idea and asked him how much it would cost. "That's a very interesting question," he said, "I suppose we should start thinking about that quite soon."*

Right away, I knew his project was doomed to fail. If his focus was poor farmers, how could he not build price into the design from the very beginning? A tool that costs too much for poor customers has to be heavily subsidized; that severely limits the number of poor people who gain access to it and profoundly disrupts the market forces that usually provide the most effective channel for its mass dissemination. The failure of the much-publicized African tool-carrier project, which cost millions of dollars and required heavy subsidies, has now been fully documented. Very few technologies developed by the appropriate technology movement ever ended up in the hands of more than a thousand people.

Similarly, this past July I was at the International Development Design Summit conference in Ghana. A woman who listened to my talk came up to me afterwards and took me to task for insisting on selling a million of anything. "Are you against small?" she asked. "What's wrong with doing a project that helps 20 people in a village? Isn't that important too?" "Yes," I said, "it is. But if you talk to the people in any village of let's say 150 families, you will quickly identify at least 20 or 30 problems that are very important for the people in that village. It takes time and money to come up with a practical solution to any of these 20 or 30 problems and make it happen—time and money not only on your part, but on the part of the village people who apply the solution. Why not pick, out of those 20 or 30 problems, the three or four that have applications to 1,000 villages? Or 100,000 villages?"

Many efforts to bring life-changing technologies to poor people are destined to have limited impact, because those projects aren't grounded in poor people's real life needs, aren't financially sustainable, and don't address the biggest, most important issues that poor people struggle with every day. Most importantly, a strategy to reach millions of poor people is rarely if ever built into the project from the very beginning. In response, Paul Polak has developed a mantra that he repeats incessantly to students and development enthusiasts around the world who aspire to be social entrepreneurs. He calls it the "Don't Bother Trilogy":

- If you haven't talked to at least 25 poor people before you start, don't bother.
- If it doesn't pay for itself three times over in the first year, don't bother.
- If you can't sell a million of them, don't bother.

THE TREADLE PUMP: BUILDING SCALE INTO
DESIGN AND DISSEMINATION

Paul: *I first met Abdul Rahman, a farmer in the Noakhali district of Bangladesh, in 1981. On his three-quarter acre rain-fed rice fields, he could grow only 60 percent of the rice the average person in Bangladesh needs to survive. During the three months before the October rice harvest came in, Abdul and his wife had to watch silently while their three children survived on one meal a day. As I walked with him through his scattered fields, I asked what he needed to move out of poverty. "Control of water for my crops," Abdul responded, "at a price I can afford." Like most smallholders, Abdul was totally dependent on the rain to water his crops. During the rainy season, he got plenty of water, but everybody else did too, so prices in the market dropped so low he couldn't earn much from selling his produce. However, if he could provide water for crops during the dry season by drilling a well or storing monsoon rainwater, he could grow off-season fruits and vegetables and earn three times as much for them in the market because prices are much higher in the dry season.*

In 1981, Abdul heard about the treadle pump, a human-powered pump sold by International Development Enterprises (IDE).² He became one of the first farmers in Bangladesh to buy one, with \$25 he borrowed from an uncle. During the five-month dry season that followed, when Bangladeshis typically farm very little, Abdul used the treadle pump to grow a quarter-acre of chili peppers, tomatoes, cabbage, and eggplants. He also used it to improve the yield of one of his rice plots. His family ate some of the vegetables and sold the rest at the village market, earning a net profit of \$100. He repaid the loan easily within four months. With his new income, Abdul was able to keep his family fed all year, keep his two sons in school until they were 16 instead of pulling them out at age 12 to work on the farm, and set aside a little money for his daughter's dowry. When I visited him again in 1984, he had doubled the size of his vegetable plot and replaced the thatched roof on his house with corrugated tin. His family was raising a calf and some chickens. He told me that the treadle pump was a gift from God.

In the 12 years after IDE began its mass dissemination of the treadle pump in 1981, 2.1 million very poor farming families in Asia and Africa invested more than \$50 million of their own money to buy the pumps and increased their net income by \$210 million a year. Another wave followed this initial explosive demand, when like-minded organizations, like Kickstart, the Food and Agriculture Organization (FAO), and Enterprise Works Worldwide, began to market their own versions of treadle pumps, with the happy result that more than 2.5 million are in the hands of small-holder farmers around the world. Although this total is tiny compared to the hundreds of millions who could benefit from this technology, the treadle pump still serves as a good example of how to scale-up a pilot development project.

Three points are key here. First, as technologies go, the pump itself is a gem: simple, easily maintained and repaired, affordable, and income-generating, all factors that correlate strongly with the ability to grow the project. Developed in the

late 1970s by Norwegian engineer Gunnar Barnes and the Rangpur Dinajpur Rural Service (RDRS), the pump works like a modern stairmaster. The operator walks in place on a pair of bamboo foot pedals, pumping water from a shallow well dug just for this purpose. Poor farmers most often irrigate their fields with buckets of water they carry from a local water source; that work is inefficient and back-breaking. In areas where the water table is high, the ability to irrigate by treadle pump not only increases the size of the plot that can be irrigated, but adds another planting and

harvest cycle during the dry season when no water is accessible on the surface. The pump is designed to do just what a farmer needs and no more—no unnecessary bells and whistles that might add to the cost or require expensive or troublesome upkeep. This leads us to the next crucial design element: cost. At a total cost of only \$25—including the expense of drilling a tube well down to the groundwater—the pump was an investment that farmers could easily pay off with increased profits from crop sales in an average of four months.

And, finally, although design and affordability are critical, equally crucial is a plan to replicate the results

In the third year after it introduced the pump in Bangladesh, IDE added a full-length Bollywood movie to its rural mass-marketing campaign. This movie, in which the treadle pump saved the day, played to open-air audiences of a million a year. The pump's impact was profound for the few who had access to it, but it would never have reached the scale it did without that movie.

on a larger scale as the initial pilot project succeeds. In the case of the treadle pump, some 75 percent of IDE staff time and project funds were focused on rural mass marketing and on engaging and strengthening the local private sector. IDE convinced 75 small, private-sector workshops with welders to manufacture treadle pumps; recruited more than 2,000 village dealers to sell the pumps at an attractive profit margin; and trained and employed some 3,000 well drillers to manufacture, sell, and install treadle pumps. In the third year after it introduced the pump in Bangladesh, IDE added a full-length Bollywood movie to its rural mass-marketing campaign. This movie, in which the treadle pump saved the day, played to open-air audiences of a million a year. The pump's impact was profound for the few who had access to it, but it would never have reached the scale it did without that movie. But how, specifically, does one build scale into the design, pricing and distribution of a technology from the very beginning? The process involves three steps.

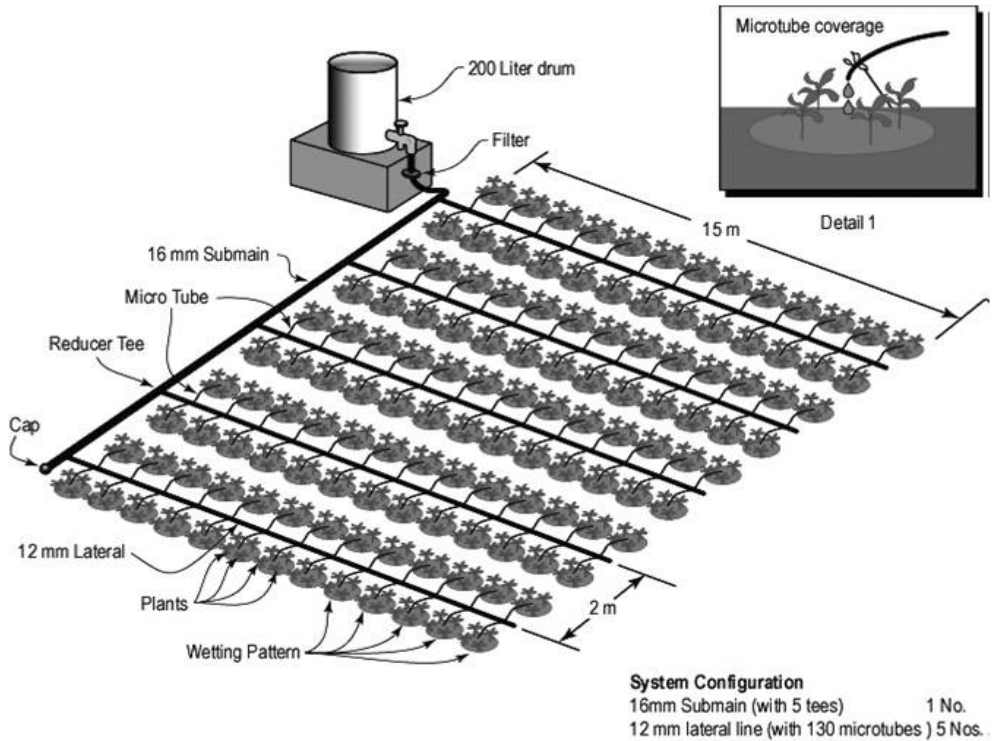


Figure 1. Light Plastic, Not Heavy Metal—The IDE Drum Kit.

The “drum kit” in this schematic illustrates a typical low-cost drip system used for plot sizes of 1/8 to 1/2 an acre. This version has a 200-liter drum, which serves as a flow-through gravity tank. The tank is raised one meter off the ground to provide the pressure needed to drive water through the system and to the drip points, called emitters, next to each plant.

To illustrate, let’s consider another IDE project: a low-cost drip irrigation system. In many dry areas of the world, drip irrigation represents the stingiest and most efficient way of delivering water to crops, and has the added benefits of improving crop yield and quality. Yet because drip irrigation requires a comparatively high capital investment, only one percent of irrigated acreage around the world uses it. To the 75 percent of the world’s farmers who cultivate less than five acres, conventional drip irrigation systems are far too expensive, and far too big to fit their typical quarter-acre plots.

Stage 1: Develop the Right Solution

IDE created a prototype for a small drip-irrigation system in Nepal that could address these affordability and size barriers faced by small-holder farmers. The system cost less than \$20, an affordable amount for Nepali farmers who earn less than a dollar a day; it would more than pay for itself in a single growing season.

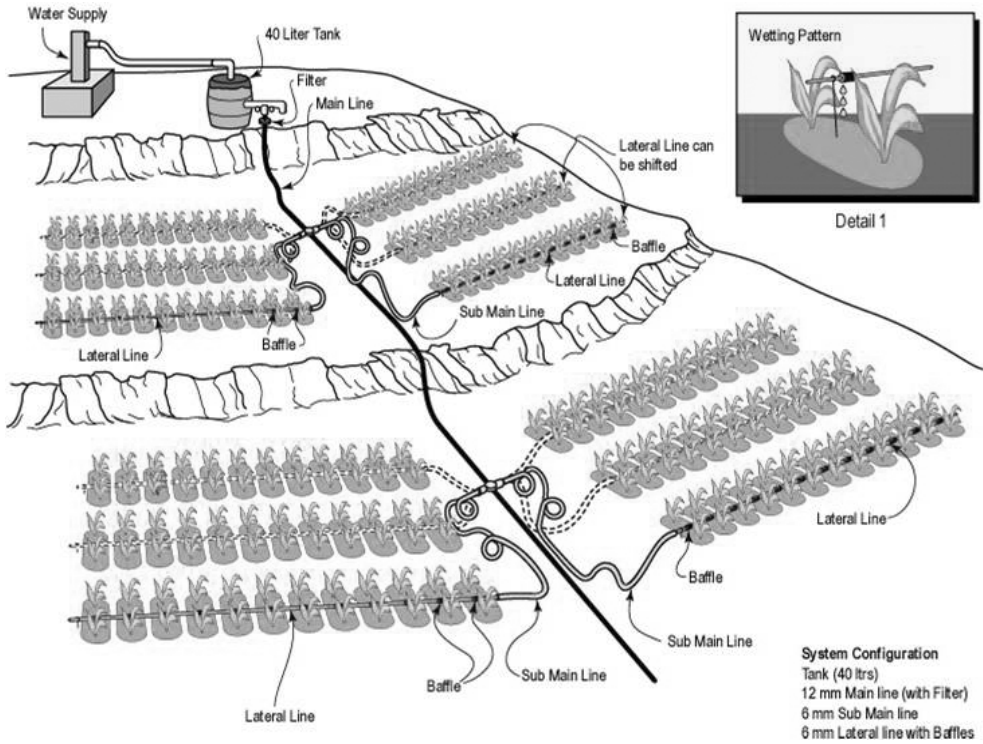


Figure 2. The Gravity-Assisted IDE Low-Cost Drip Irrigation System.

In hillside environments such as in Nepal, water can flow by force of gravity from the stream into the drum and from the drum to the field by adding a cheap pipe in the stream above a field. This version uses shiftable lateral lines and baffle-covered holes as emitters.

Recognizing that even at \$20, the system might not be within reach of everyone who could benefit from it, IDE created an even smaller, cheaper system: a 20 square meter kitchen garden drip kit that cost \$3. Women who used it earned \$10 in the first year, allowing them to “move up” to a more expensive system.

The key to developing an extremely affordable product was decreasing the cost of materials. IDE started by reducing the water pressure required to move water through the system; it used a bucket or drum to collect water a meter or two above the field, instead of the 10-meter head used by conventional drip systems. This allowed the team to dramatically decrease the thickness of the tubes carrying water to each row of crops. Then they replaced expensive filters with flour sifters lined with cloth that could be washed every day, and they replaced expensive emitters with holes in the pipe, in which they placed microtubes. These modifications cut the cost of the system in half. In addition, they designed the ongoing maintenance to be both affordable and locally available. The systems could be easily installed and repaired by the farmers who bought them, and a whole range of simple

replacement parts was made available through the same village dealers who sold the drip systems.

The IDE team then went to ten Nepali farmers. They asked the farmers what problems they experienced using the prototype, so they could quickly re-think, re-design, and re-test it. This process of repetitive field trials was and remains critical to building scale. But early on, IDE learned another key lesson: by itself, a well-designed and affordable product wouldn't solve the problem. You must talk to the customers, again and again and again. In the case of small-scale drip systems, we found that in the first year after they bought a system, farmers didn't use it as much as they could or would find beneficial, as few had much experience growing the more lucrative off-season vegetables that this system made possible. Using drip systems to grow vegetables in the dry season demanded a different way of farming—intensive horticulture—that was unfamiliar to the farmers of subsistence crops like rice, wheat, or corn. To get millions of people to adopt this technology, IDE needed to dispatch agronomists on bicycles to train the farmers. Many an excellent project has died on the vine because we fall in love with the technology and forget to pay sufficient attention to how that technology is being used—or not used—in the real world.

Finally, the decision about where to place the prototype was critical to the field testing. In this case, IDE tested it with farmers in visible locations close to Pokhara and on the outskirts of Kathmandu, where its use could spread quickly as other farmers, leaders of development organizations, and government officials could easily hear about it and see it in action. This was “viral marketing” for the developing world. Exposing the beta product to a larger base of potential customers also elicits even more feedback on product design and user specifications. It also helps build a groundswell of excitement about the product and a strong base of future customers.

Stage 2: Reach the First 1,000 Customers

After a one-year process of adapting the first drip irrigation prototypes based on the Nepali hill farmers' feedback and experience with it, the team was ready to expand sales to reach the first 1,000 customers. They hoped to find that the experience of Krishna Bahadur Thapa would be typical: he bought a system for \$26 and was rewarded with a net return of \$150 from the cucumbers and cauliflower he grew. The team also knew that farmers who reaped rewards from investing in these systems would continue to buy larger and larger systems, which would function as great marketing for the products among their family and friends. Therefore, the design team made an array of kits that could be affordably linked to each other to cover larger and larger plots of land.

When the IDE design team was satisfied that it had created a range of successful prototypes, they helped local Nepali village entrepreneurs set up two plastics extrusion plants making drip irrigation tubing and several more assembly enterprises. Simultaneously, they turned their Nepali staff members loose to talk to



A Nepali Farmer Irrigating Vegetables with her Low-Cost Drip System.

A Nepali woman uses an IDE kitchen garden system with a 40-liter plastic gravity tank. IDE's smallest system makes drip irrigation practical and affordable. Systems such as this one can be affordably linked to each other to cover larger and larger plots of land. In contrast, systems such as those used in large-scale California grape production are available only in massive sizes, and use long plastic tubes (called "laterals"), which require high water pressure driven by a diesel or electric pump and thick-walled plastic tubing to avoid bursting. These and other requirements are too costly for use on smaller plots. IDE's systems use much shorter lateral lines (plastic pipes) and require one-tenth the water pressure that conventional systems do. A diesel pump used to provide pressure for a conventional drip system in India costs \$250, compared to \$10 for a 55-gallon drum or even a \$1.50 double-walled plastic bag sitting on a simple bamboo table.

rural farmers and support local dealers in selling drip irrigation systems. It took two years to sell the first 1,000 systems that truly met farmers' needs, were reliable and affordable, and could earn the farmers three times their investment in the first year. Once the product and business model were on solid footing, and the enthusiasm, awareness, and demand for it were growing, IDE was ready to expand again.

Stage 3: Reach at Least 1,000,000

States like Maharashtra and Rajasthan in the Deccan plateau in Eastern India were prime areas for expansion. There, in the dry season, farmers had little water—only what they could collect each morning in a multitude of large open wells. And they

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could grow only a few of the vegetables and fruits that afforded them a healthy margin and livelihood. Similarly, in peri-urban areas in sub-Saharan Africa, millions of farmers' yields were limited by their practice of using sprinkling cans to carry water from ditches, streams, and rivers to irrigate their vegetables. IDE expected that its drip system would meet with great demand in both places.

The first approach IDE took to bring low-cost drip irrigation to at least one million dollar-a-day farmers was to try to persuade large international drip irrigation companies to introduce and mass market small, low-cost systems. Partnering with large corporations has traditionally run counter to the beliefs of many development organizations, but in IDE's view it was simply expeditious because corporate producers already had manufacturing facilities, raw material sources, the ability to produce large volumes, and marketing and sales capacity.

Paul: Despite our enthusiasm for commercial paths to scale, we encountered skepticism from irrigation producers. I met with the leaders of Netafim, the world's largest drip irrigation company, but came away empty-handed. Netafim was interested in partnering with us only if we could get World Bank subsidies to deliver its more expensive drip systems to African farmers. Netafim executives were concerned that manufacturing lower-cost systems would negatively affect the company's brand by associating it with low-cost systems. We faced a similar reaction from Jain Irrigation, India's largest drip irrigation company. We had no choice but to introduce low-cost drip irrigation to the market ourselves, through IDE India, which was established in 1987 to improve the livelihoods of small farmers by providing access to affordable irrigation tools and is now an autonomous development organization. Taking advantage of the dissemination strategies we had honed as we mass marketed treadle pumps in Eastern India, IDE India recruited and licensed several manufacturers and many rural dealers, and launched a rural marketing campaign to popularize low-cost drip irrigation.

Fortunately, most poor farmers were already familiar with drip irrigation technology, since their richer neighbors were already using higher-cost versions of it. And, as a result of our high-visibility prototype development approach, many were also aware of IDE's low-cost version. Sales in India rapidly grew to several hundred thousand systems, and wealthier farmers began to prefer IDE's low-cost systems to conventional drip systems for their smaller crops, like 30-acre banana farms. Ironically, today, both Netafim and Jain Irrigation have introduced their own smaller, lower-cost systems. And IDE has now introduced low-cost systems in Myanmar, Zambia, Ethiopia, Nicaragua, and Zimbabwe, working with a variety of local partners. At present, the global market for these irrigation technologies far exceeds 10 million customers.

. . . BUT WE MUST DO BETTER

Over the past 25 years, more than three million one-acre farmers in developing countries who live on less than a dollar a day have invested \$139 million of their own money in extremely affordable, income-generating irrigation tools from IDE—and have thus doubled their incomes. And in selling 2.1 million treadle pumps through rural small enterprises, IDE encouraged the emergence of a move-

ment to help small farmers around the world improve their livelihoods from farming; in this movement organizations like One Acre Fund, KickStart, and Enterprise Works Worldwide now play leadership roles. Nevertheless, it has taken Paul Polak decades to realize that the efforts of IDE and others did not, and still do not, represent a model that can or will be scaled at the level we need to move the needle on global poverty.

Similarly, Muhammad Yunus had a revolutionary dream: lend small sums of money to poor people and enable them to create and grow small enterprises to lift themselves out of poverty. His leadership has galvanized a global microcredit movement. By July 2008, his brainchild, Grameen Bank, had issued US\$6.38 billion to 7.4 million very poor borrowers. Grameen's efforts have galvanized others, like Acción International, MEDA, and even commercial banks to, offer microloans around the world, making capital more readily available to poor people and at better rates than ever before. While recent studies, using randomly assigned controls, have raised interesting questions about the impact of microcredit, no one questions that microcredit services are now being delivered to poor customers at scale. This is a remarkable achievement. And yet, in the global context of extreme poverty, 1.1 billion people still live on less than a dollar a day and 2.4 billion live on less than \$2 a day: that is 40 percent of the world's population. Relative to the need, our collective best efforts are but a drop in the bucket. We must do better.

The single biggest challenge in development is to replicate success stories from those like IDE and Grameen Bank to achieve far greater scale than we can today. Many have pointed to the private sector and commercialization strategies as a promising way to get there. But the fact that corporations are increasingly interested in social causes should not be cause for premature celebration. Unfortunately, with few exceptions, this growing interest has led to very little measurable change at the kind of scale we need. Why? Because, to date, most corporate involvement has taken the form of either charitable efforts or "socially responsible" commercial ventures that fail to target poor customers. And only a scant few of those developing products and services for the poor have bothered to structure their businesses to offer real market rate returns that would attract large numbers of traditional investors.

The Promise of Corporate Philanthropy

In the last two decades, many multi-nationals have developed corporate philanthropic arms to address the most pressing social and environmental needs in the communities where they operate. Some see the rise of corporate involvement in philanthropic activities as reason to hope that corporations can lead the way in addressing global poverty and inequities. But corporate giving constitutes an inconsequential percentage of total annual charitable giving: nowhere near enough to improve the lives of 2.4 billion people.

Another distressing reality is pointed out by Jed Emerson, a leading thinker on social return on investment, in his article, "Horse Manure and Grantmaking." All

too often, philanthropies—including corporate foundations—use grantmaking dollars (the 5 percent of funds generated by the foundation’s corpus or income-generating assets) to pursue their social missions, meanwhile ignoring the fact that 95 percent of their assets are judged solely on financial performance. That is, they have 95 percent of their money invested in companies that may be destroying the very social or environmental value the foundation seeks to create.

The Promise of Corporate Social Responsibility and Social Businesses

Many companies are seeking ways to improve their human resource, labor, and environmental practices or to make their manufacturing practices greener. But the primary beneficiaries of these activities are the company’s employees and the communities in which they operate. A more ambitious subset of enterprises has set out to achieve both measurable social impact alongside profitability. While laudable, these corporate activities rarely aim to earn profits by selling products and services that address basic human needs and generate income for the poorest of the poor. So, the lives of the poor have remained largely untouched by them.

In *The Fortune at the Bottom of the Pyramid*, C. K. Prahalad popularized the potential of commercialization to generate real and sustainable wealth for the very poor. Unfortunately, the promise of the book is not realized in practical implementation. Most of the examples Prahalad describes are of admirable businesses serving middle-class customers, with products like color TV sets and refrigerators that are totally out of reach for people living on less than \$2 a day. And, in his upcoming book, *Building Social Business: The New Kind of Capitalism That Serves Humanity’s Most Pressing Needs*, Muhammad Yunus puts forward the concept that “social businesses”—for-profit enterprises with a core social purpose—will be the engine of social change. He describes, for example, Grameen Danone Foods in Bangladesh, which daily improves the health of low-income, nutritionally deprived populations with a tasty form of yogurt. This concept is likely to have a significant impact in some markets serving extremely poor customers, but investors in social businesses like Grameen Danone Foods simply get their money back, with no interest or dividends, so such projects are likely to have very limited appeal to mainstream investors. And those are precisely the investors we need in order to launch the large-scale businesses that can help hundreds of millions of the world’s poorest move out of poverty.

To have any hope of making a meaningful impact on the epidemic of global poverty, we must be able to design and implement development programs that can end the poverty of a hundred million people at a time. Unfortunately, over the past 50 years, we have invested trillions of dollars in large and small initiatives to eradicate poverty, with very little to show for it. But, a few encouraging approaches have achieved measurable results at significant scale.

IT CAN BE DONE: THE CASE OF MOBILE TECHNOLOGY

The recent and rapid mass marketing of cell phones in developing countries provides one encouraging model. There's no question that cell phones have very quickly reached a remarkable level of global adoption. By the end of 2008, mobile cellular subscriptions totaled approximately 4.1 billion worldwide. Global growth in developing regions has been fastest in Africa, where mobile penetration has skyrocketed from 2 percent in 2000 to almost 30 percent today.³ While it is estimated that only 3 percent of the bottom billion customers worldwide now own phones,⁴ many times more have informal access to the cell phones of relatives or friends, or can rent one at a modest fee from a cell phone entrepreneur.⁵

Before the introduction of mobile technologies into poor farming communities, most poor smallholders in developing countries had to take their crops to market and accept whatever price was on offer, which usually meant 10 to 40 percent less than what they could get if armed with timely market price information. In addition to cash and opportunity cost savings to farmers, in places like Niger, mobile technologies have contributed to narrowing differences in grain prices across markets by 20 percent with the biggest impact on price dispersion found in the most remote markets and in those with limited road access.⁶ Text messaging, and SMS in particular, has proven to be an affordable way for poor people to gain access to critical income-generating information.

What has allowed mobile technologies, micro-credit, and basic agricultural technologies to be adopted so widely, even among the poor? These are products and services that poor people themselves are willing and able to invest their own meager funds to acquire. Nokia sells mobile phone services and earns healthy profits doing it, and poor farmers who rent cell phones expect to get at least three times their money back by taking advantage of the information they get by doing so. Grameen Bank doesn't give grants to poor people, no matter how badly they may need the money. Instead, it provides loans at varying interest rates, and expects people to pay them back; a surprisingly high percentage do. Farmers who live on less than a dollar a day invest their own money to rent phones, take out loans (or purchase treadle pumps or low-cost drip irrigation systems) at the full fair-market price because they see clearly that the purchase will soon generate significant income. Everyone wins.

THE ROAD TO SCALE IS PAVED WITH PROFITS

The world is just now beginning to emerge from a severe recession, one in which, ironically, thousands of small and large businesses struggle to survive by competing with each other to serve only the richest 10 percent of the world's population. But plentiful opportunities exist to create Henry Ford sized new markets that serve the needs of the most neglected group of customers in the world: the 2.4 billion people who live on less than \$2 a day. One billion people who regularly get sick from drinking contaminated water are waiting for the large multi-national com-

pany that will deliver safe drinking water in their villages at a cost lower than what they pay to treat the dysentery and other illnesses they now get from their water. The one billion or more customers who will never connect to the electric grid are waiting for the company that finds a way to deliver electricity to their homes for less than the \$5 to \$10 a month they now pay for flashlight batteries, kerosene, and candles.

And just as there are plentiful opportunities to create tremendous new markets that serve poor customers, there is a vast reservoir of untapped entrepreneurial energy in hundreds of millions of poor people themselves, who have, by necessity, learned survival entrepreneurial skills at an early age. This is a talent pool that corporations can tap to build local, cost-efficient supply chains, ensuring even greater wealth creation for the poor.

What's keeping current corporations from creating these new markets?

They don't see a profit in it.

They don't know how to design products and services at the radical level of affordability required to meet the pocketbooks of poor customers.

They don't know how to design the decentralized supply chains required to serve the billions of very poor people who live in rural villages.

It's hard to believe that nobody saw a profit in personal computers either, until Apple created a much cheaper computer that was so small it could sit on somebody's desk. Poor people are more than willing to spend their meager amounts of money on things they value and that will make them more money: things that are simple, reliable, affordable, and offer a better alternative to their current options. But three major challenges must be overcome. The first is to design products and services that are radically more affordable than those sold to the richest 10 percent of the world's customers; this requires a total rethinking of conventional design processes. Most current design teams in big businesses don't know much about the characteristics and preference of poor customers, and many have a track record of earning the most attractive profits by designing high-end, high-margin products. The second is to focus on earning profits from very large volumes of low-margin products. This is a comparable but more bracing challenge than the one that supermarket chains faced when they began to use "value" pricing to compete with mom-and-pop grocery stores. The third challenge is to create hundreds of thou-

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sands of kiosks and small stores in rural villages that can bring these high volumes of products and services to poor customers at volume, and make money doing it.

What is most urgently needed now is a practical working model of a multinational business that achieves both a measurable positive impact and scale by serving the needs of at least 50 million of the world's poorest customers, and generates commercial rates of return for its investors by doing it.

WINDHORSE INTERNATIONAL: SERVING THE WORLD'S POOREST CUSTOMERS AND MAKING A PROFIT

The most direct way to end poverty is to create a model that gives companies a real financial incentive—in the form of substantial profits—to invest serious money in serving the world's poorest 2.4 billion customers. With the exception of cell phones, this model has yet to be demonstrated.

Paul: The mission of Windhorse International is to prove that investors and entrepreneurs who deliver goods and services to poor people can earn attractive profits. They can do so by designing and selling radically affordable tools and services through highly decentralized supply chains serving customers who earn \$1 to \$2 a day. We'll start by demonstrating that we can make money providing safe drinking water to the more than a billion poor people in the world who don't have it.

Some 400 million people live in rural areas in Eastern Indian states like Uttar Pradesh, West Bengal, Bihar, and Orissa. Fewer than five percent of them use latrines; most people simply defecate in the fields. During the four-month monsoon season ending in October, when much of the rural landscape becomes a continuous pond, the soil and subsoil become permeated with disease-causing fecal pathogens. Most commonly, people collect drinking water from shallow open wells, using a bucket on the end of a rope. But since this well includes surface water, it is filled with these disease-causing pathogens. The same is true of the shallow ponds that others use for drinking water, and most shallow tube wells operated with hand pumps are also contaminated. Villagers typically spend US 75 cents to visit a clinic that can treat the dysentery and other illnesses they contract from the water they drink; they spend an equal amount for medicines, and if they can't work for a week, they lose another \$5 or more. Often, they are well aware that the water is causing their maladies, but they feel they have no other affordable options.

To address this need, Windhorse International has identified new breakthroughs, developed by companies like Miox and Cascade Design, and development organizations like Antenna and D-Rev, in generating chlorine from brine through electrolysis, as the most cost-effective way to purify drinking water in villages. Windhorse has now formed a joint venture partnership with IDE India to sell safe drinking water at an affordable price to some 30 million poor rural families in Eastern India—and to make money at it.

The partnership will use a \$250 electrochlorinator made by Antenna that can generate enough chlorine solution to produce 80,000 liters of safe drinking water a day,

2.4 Billion Customers

and will deliver it to poor customers at a price they can afford. The water will be provided through village micro-kiosks, each capable of delivering as little as 500 liters of water a day to women coming to fill their 20-liter containers. To enhance margins, a home delivery service will be available at double the kiosk price, and the business will also sell a variety of higher-end, higher-status water products to middle-class customers. The first step is talking to many, many potential customers and testing a prototype with them, getting feedback, and refining the system based on that feedback. We plan to begin with a six-month test period setting up at least 10 micro-kiosks selling safe drinking water to 3,000 poor rural households a day in three separate multi-village regions in rural Orissa. During this beta test phase, we will collect systematic information on how both the technology and the business strategy work in practice and will adapt our approach accordingly. At the end of the beta test phase, we will hire a management team capable of implementing a rapid scale-up program. By the end of the third year, we expect the 1,100 regional systems to be delivering more than 10 million liters of safe water to one million poor rural households each day.

But the end of year three will represent just the beginning. We expect the exponential process of expansion to continue in Eastern India over the next five years, delivering approximately 100 million liters of safe drinking water to 10 million rural households by the year 2020. We plan to roll out a similar initiative delivering safe drinking water to poor households in sub-Saharan Africa and in Asia. And by the year 2011, we expect to be a global company providing safe water products. I know that many people will find this to be a wildly optimistic plan. But I believe that that the only way to create wealth at the scale our world's population requires is to make poverty alleviation a profitable business.

THE PEACE AND PROSPERITY OF NATIONS

It seems self-evident that we should care about helping 2.4 billion people raise themselves out of poverty. But really, why should we? Most of us working in the field of development fall into that fortunate few: the richest 10 percent of people in the world. Is it altruism alone that motivates us to care about the fates of billions of individuals whose lives we know relatively little about? For some of us, perhaps. But for most, recent history has made it painfully evident that the fates of all nations are connected. As economic institutions and markets have become ever more globally linked, the peace and security of our nation and of all nations are inextricably interwoven. And the widening gaps between the “haves” and the “have nots”⁷⁷ are not simply morally questionable—they also lead to greater violence and instability and further economic stagnation. As President Barack Obama cautioned the world in his Nobel Peace Prize speech in Oslo, Norway, “Security does not exist where human beings do not have access to enough food, or clean water, or the medicine they need to survive.” As we slowly recover from the worst economic downturn in nearly a century, we would be wise not to ignore the spectacular opportunities to create jobs and profits and to spur more rapid economic growth by giving birth to dozens of Henry Ford sized new markets that serve 90

percent of the world's customers. By investing in income-generating enterprises that provide access to basic human needs, we are investing not only in prosperity but also in education, health, and greater global security.

The strategies to get there are surprisingly simple. We need to start by recognizing the enormous market opportunity to create products and services that 90 percent of the world will pay for instead of limiting ourselves to 10 percent of the world's customers. We need to start treating the poorest of the poor as customers, not as charity cases. We need to listen to those customers to understand their biggest, most pressing needs and build simple, affordable solutions; ones that can be easily maintained and which create profitable businesses for local entrepreneurs. And we need to do so by relying on business models that offer attractive profits to companies and commercial rates of return to investors. Most importantly, we need to galvanize and embrace the self-interest and enterprising spirit inherent in all of us—companies, investors, and poor people. The most effective way to reach the world's poorest people and to give them the chance to generate wealth and lift themselves out of poverty is to energize market forces, those same forces that have fueled enormous wealth creation in developed nations for generations. The time to begin is now.

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1. 2008 World Bank Development Indicators and World Bank's 2007 report *Understanding Poverty* indicate that the number of people living on less than \$2 a day is as high as 2.6 to 2.7 billion.
 2. Founded in 1981 by Paul Polak, IDE has relied on a market-oriented development model to increase the income of the rural poor. IDE's projects aim to increase income for those living on less than a dollar a day in the most efficient and viable manner possible, according to each region's unique opportunities. To date, throughout the world, IDE staff has helped more than three million entrepreneurial farm families and their 19 million family members lift themselves out of poverty, permanently.
 3. International Telecommunication Union (ITU), *2009 ICT Development Index, Measuring the Information Society* p. 2. Geneva.
<http://www.itu.int/ITU-D/ict/publications/idi/2009/material/IDI2009_w5.pdf>.
 4. International Telecommunication Union (ITU), *2009 ICT Development Index*, Geneva.
<<http://www.itu.int/ITU-D/ict/eye/Indicators/Indicators.aspx>>.
 5. R. Heeks. "ICTs and the World's Bottom Billion." *Development Informatics Short Paper no.10*. Manchester, UK: Centre for Development Informatics, IDPM, SED, University of Manchester, 2009. <http://www.sed.manchester.ac.uk/idpm/research/publications/wp/di/short/di_sp10.pdf>.
 6. Jenny C. Aker, "Does Digital Divide or Provide? The Impact of Cell Phones on Grain Markets in Niger." BREAD Working Paper No. 177, 2008.
<<http://ipl.econ.duke.edu/bread/abstract.php?paper=177>>.
 7. According to the United Nations Development Program's 2007 Human Development Report, more than 80 percent of the world population lives in countries where income differentials are widening.