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Demand-Driven Innovation

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Demand-Driven Innovation means understanding customers in poor communities and paying attention to the channels that move goods and services to these markets.

Demand-Driven Innovation

Demand-Driven Innovation (DDI) requires a shift in thinking about how to tackle global poverty. It challenges commonly held assumptions about the needs and wants of poor communities, integrates information from customers into the design and development of products and services, and calls for careful consideration of how to reach these underserved markets.

For many years, the international development community has been criticized for its lack of on-the-ground impact. Now donors must answer hard questions, such as: *How many people are actually using the products and services we've spent so many decades and dollars creating? Why aren't we reaching more people?*

In the fields of health, agriculture, energy, education, water, and sanitation, many innovations have enormous potential. For example, mobile phone services inform smallholder farmers about the coming weather and the market prices of crops. Sweet potatoes bred to contain high amounts of vitamin A protect children from blindness and death. Solar installations bring light to rural communities.

Yet if you ask how many people are using these innovations, the answer is almost always: *Nowhere near the number who could benefit from them.*

International development has its success stories, of course. Polio has been nearly eradicated from the earth. In the last 20 years, almost 1 billion people have been lifted out of poverty, and more than 2 billion people gained access

What is DDI?

Demand-driven innovation means understanding customers in underserved communities and paying attention to the channels that move goods and services to these markets. Because demand-driven innovation responds to the "pull" of demand rather than the "push" of supply, it helps:

» **underserved customers access better products & services**

» **donors make larger impacts on social & environmental problems**

» **governments serve their citizens**

» **companies reach new markets and build sustainable value chains**

» **nonprofits & charities deliver on their missions.**

to improved drinking water sources. But if we are to meet today's global challenges, we must change how we innovate for the 1.2 billion people now living in extreme poverty.

In this paper and its accompanying website, **www.demand-driven.org**, we lay out the six principles that serve as the foundation of Demand-Driven Innovation. These are core areas where we can improve impact in international development if we think about how to apply common commercial practices. DDI is about bringing better business practices into international development, while making sure those practices have been *translated* to support the innovation that meets the needs of poor people in developing and emerging markets.

After laying out the principles, we delve into the *practice* of DDI, suggesting how readers can integrate DDI into their work. Because DDI principles can be implemented in diverse ways, this is not a prescriptive, how-to guide. Instead, we have drawn together questions that practitioners can ask if they want to create, deliver, and improve demand-driven innovations.

We derived these questions, plus the anecdotes to illustrate them, from our own experience and from interviews with nonprofits, companies, foundations, and international aid agencies. We propose that these DDI questions should become part of standard due diligence for designers, donors, investors, policymakers, and other people supporting innovation in poor communities.

Now More Than Ever

In the coming decades, explosive population growth, unprecedented demands on our global food system, and increasingly variable weather will test our global capacity to tackle poverty. Poor communities will bear the brunt of these global changes because they lack the resources to cope with, change, or escape them.

Unfortunately, our international development systems remain inefficient and ineffective. Innovating products and services for the poor is still mostly supply-driven and top-down. Many products and services continue to be pushed along without rigorous attention to potential adoption, to scaling across larger populations, or to understanding the channels that will get innovations out to market.

DDI provides a framework for thinking early on about the people who will use products and services in poor communities. It also gives guidelines for meeting the needs of the diverse players along the value chain—from financiers, designers, and manufacturers, to distributors, marketers, and regulators.

Six Principles of Demand-Driven Innovation

The principles of DDI are rooted in regular business practices. Yet these practices cannot be exported straight to international development, because reaching poor communities is far more difficult than reaching established markets. In addition, people working in international development have goals other than generating profit. And so business practices have to be *translated*, or they may do more harm than good.

Consider the challenge of marketing. Poor markets are often geographically, linguistically, and culturally dispersed, which makes engaging potential customers difficult. For these same reasons, distribution and scaling can be stumbling blocks. Less-developed markets also lack dependable data, which can inhibit the development of a good business strategy, the ability to engage private capital, and much else. Making and enforcing contracts in poor communities is also a more complicated undertaking, as contracts must accommodate both local and national variations in laws and law enforcement.

Further complicating the translation of traditional business practices is international development's concern with the "triple bottom line" of social impact, environmental impact, and profit. To put it simply: triple bottom line = people + planet + profit. Meeting these three bottom lines often involves partnerships between public and private sector partners, each of whom may concentrate on a different facet of this equation. Their unaligned interests can make it difficult to coordinate partners' activities.

DDI Principle #1: Adapt the Discipline of Profit

In business, the pursuit of profit compels firms to focus on demand. This focus requires a degree of discipline not present in many international development projects. Businesses assess and reassess the potential market for a good or service at every stage of commercialization—from upstream investment decisions; through research, design, and development; to manufacturing, distribution, and marketing. If the demand for a product or service is not enough to push forecasted revenues above costs, businesses shelve the project. Thus the commercial innovator's maxim: *Fail early. Fail often. Fail cheap.*

DDI PRINCIPLE #1: Adapt the Discipline of Profit

To make profits, businesses understand and meet the demands of their markets. Without profit as a driver, international development projects must think about demand in new ways.

Now consider an innovation designed to improve the welfare of people in poor communities. An inventor in a university lab has a seemingly great idea, a philanthropist donates some money, and before you know it, a nonprofit is working to distribute the product. Without the discipline that profit-seeking requires, these innovators typically think too little about how best to design, develop, and commercialize their product for its intended market.

Of course, people working in international development cannot directly apply the discipline of profit, because their innovations aim for broader and harder-to-measure social and environmental gains. But they can *translate* for-profit thinking.

A purely commercial product or service derives profit from three components: 1) the price charged, 2) the costs saved, and 3) the number sold. Innovators who target poor markets can translate these three components by asking: 1) *How much will potential customers value my innovation?* 2) *How affordable can I make my innovation, while still sustaining my venture?* and 3) *How many people can my innovation reach?*

Asking and answering these questions creates a better understanding of the "pull" of demand from both customers and commercialization partners. These questions also will get people thinking early about scale; this is important because too often innovators do not adequately account for the tradeoffs in design, manufacturing, distribution, and marketing that reaching large markets requires. Practicing DDI enables discussion of these tradeoffs even in the pilot stage of innovation.

The commercial maxim "fail fast, fail often, and fail cheap" also needs translation. In business, investors calibrate their funding to the likelihood, timing, and size of expected profits. The intention is to balance the potential for profiting from a successful new innovation with the chance of wasting money by backing the wrong horse.

Donors in international development have to consider more than just financial indicators, because their investments also have social and environmental impact. Yet they can make better decisions by asking hard questions, using smart metrics, and bringing more rigor to their due diligence. Donors can apply a version of the fast-fail concept to choose which projects not to fund in the first place, to continue funding, or to take to scale.

DDI Principle #2: Avoid Crowding Out the Private Sector

One downside of profit-driven innovation is underinvestment in products and services that could impact the poor. Opportunities are missed because low profits or high risks deter the private sector.

To fill the gaps, the public sector often tries to invest in places where companies will not. For example, many health products that poor people want and need don't draw commercial investment because the market isn't there. Low-income countries spend US$21.60 on healthcare per person annually, while wealthy countries spend US$4,380.[1] Drugs, vaccines, and diagnostics for diseases that primarily affect the poor, like malaria and tuberculosis, are either not invented or don't reach the markets where they are most needed. For these and many other products and services in the fields of education, health, energy, water, sanitation, and agriculture, we depend on: 1) policies supporting innovation to address market failures; 2) a vibrant landscape of innovators committed to social and environmental goals; and 3) well-targeted public sector funding that works in concert with the private sector.

DDI PRINCIPLE #2:
Avoid Crowding Out the Private Sector

Consider what resources and capacities private sector partners can bring to a project so you can assess whether, and how, to engage companies.

Failures to meet the needs of poor markets abound, however. For example, before investing in building and operating cell-phone towers, commercial cell-phone companies require a minimum number of mobile subscribers in a geographical area. Communities without enough people who can afford to subscribe miss out on invaluable mobile phone services.

Although public-sector policies and investments can often remedy this and other market failures, they may also sometimes "crowd out" private sector involvement. For instance, a government subsidy providing low-cost seed to poor farmers may depress prices and prevent seed companies from serving the same market. Foundations, aid agencies, and governments try to design their interventions in ways that don't crowd out commercial activity, but it's not easy.

Our DDI practice starts by assessing where private sector assets and capacities might be engaged. The incentives private partners need to participate are considered early on and balanced with the goals of the project. Planning for whether, and how, to engage private partners is an integral part of innovation. In this way, innovators can reduce the crowding out of private-sector involvement.

Understanding how to engage the private sector is a serious challenge for many international development projects, which may have limited capacity for structuring deals, coordinating intellectual property rights, and other issues. To help, our DDI framework encourages innovators to create a map of their potential partners at every stage of getting a product or service to poor markets. The map includes partners' incentives, costs, revenues, and risks. This process identifies both the opportunities and risks of engaging various private-sector actors.

DDI Principle #3: Measure Wisely

We have entered an era where data are cheaper and easier to collect than ever before. Using data to improve our decision-making is an increasing challenge for foundations, NGOs, and governments. They are beginning to adopt measurement practices from companies, but even companies continue to grapple with what to measure, how to measure it, and what to do with the results. Translating good uses of metrics from business to international development is a key part of DDI.

International development practitioners often make the bulk of their measurements *after* a program is over, sometimes years later. Collecting good metrics *during* a program, though, can create opportunities for change mid-stream for greater impact. Longer-term learning, with tools like randomized control trials, remains an essential component of international development. But we are missing the use of shorter-term operational metrics. Business managers have to make quick decisions based on limited information, and so many collect dashboards of real-time metrics. Program managers in international development could likewise up their game by tracking more real-time operational data.

Another problem with metrics in international development is that people underestimate how much measurement practices affect the behaviors of partners and customers. For instance, requiring staff to report on the number of cookstoves delivered can lead staff to "dump" products on households, without monitoring whether they use the devices. Alternatively, reporting whether customers actually use the stove over time will lead to a focus on demand rather than supply.

International development programs also usually fail to consider the cost-effectiveness of their metrics. Many funders still use versions of metrics rooted in academia where, by design, people pay less attention to the cost of knowledge. If the costs of collecting and processing the data were reported along with the metrics themselves, practitioners could have more informed discussions about how and what to measure.

DDI proposes a translation of good commercial measurement practices, including taking real-time measurements to improve operations, considering the effects of metrics on people's behavior, and accounting for the cost of measurement.

DDI Principle #4: If Demand Isn't There – Mix the Pull and Push

Even when following DDI principles, getting poor communities to adopt new products and services can be an uphill battle. Often, the international development community resorts to *pushing* out its innovations. Nonprofits in particular have a long history of giving away their products, and then being surprised when their targeted customers discard their products outright, abandon them after a while, or put them to alternative uses. Real demand is when a customer weighs the value of using a product or service, and then makes the decision to adopt it.

DDI focuses on using information from customers to design better products and services. It also emphasizes raising awareness among customers (marketing). But even good work in both of these areas sometimes doesn't suffice, because customers still do not see the value in adopting an innovation. Here, DDI recognizes the need for international development projects to *create demand.*

For instance, the World Food Program's "Purchase for Progress" buys food for aid purposes locally, instead of importing it. When local farmers can make money from selling their crops, they attach

DDI PRINCIPLE #3:
Measure Wisely

Look beyond traditional monitoring and evaluation for cost-effective, real-time metrics that guide improvement.

DDI PRINCIPLE #4:
Demand Can Require Pull & Push

Getting poor customers to adopt new products and services sometimes means using a strategic mix of "push" and "pull" mechanisms to create demand.

more value to the inputs they use. "Purchase for Progress" *creates demand* for innovations in irrigation, fertilizer, and seed.

Likewise, the East Africa Dairy Development project worked with Heifer International to install milk chilling plants that connected dairy farmers to markets. This *created demand* for livestock management innovations because farmers saw the value in increasing their milk yields.

DDI proposes a variety of practices that *create demand*. But the pendulum should not swing too dogmatically to the *pull* side. Demand can have different components, requiring a mix of push and pull.

DDI Principle #5: Be Smart About Scaling

Recent trends in international development have made pushing for "scale" almost as much of an obsession as measuring impact. Scaling is rarely well defined, but often refers to the shift from small projects that might impact hundreds of poor people, to programs that can impact many thousands.

No one can deny that the problems we face require us to "think big" and work toward creating products and services that have impact across large populations. But triple-bottom-line innovations are inherently hard to scale for a number of reasons. The markets themselves have serious scaling limitations. Poor communities are highly heterogeneous. Demand varies because an innovation that holds value for some will not hold value for others. Marketing an innovation at scale is difficult and often requires traversing multiple languages and cultures. Distribution, especially in rural areas with poor road networks, is expensive to expand.

Scale issues are often neglected in the design of products or services, requiring costly re-engineering at a later date. For instance, if the strategy for scaling a product involves manufacturing in another country, innovators may need to reduce the product's weight and modify its design for shipping.

Choosing the right partners is also critically important for successful scaling. International development funders often invest in pilots to prove the concept of an innovation, but do not test the potential for scaling during the pilot phase. Selecting partners chosen to anticipate scale can drastically improve an innovation's long-term potential for impact.

Some of these problems are characteristics of poor markets, but others can be addressed by considering scale throughout the innovation process. Our DDI practice framework suggests ways to keep scale in mind at every stage, including when designing products and services, vetting partners, and crafting commercialization and marketing strategies. Importantly, DDI suggests ways to balance the tradeoffs that arise when considering issues of scale. The types of products and services that can be delivered across a few villages may be different than that which can be delivered across ten thousand villages. Without thinking about these tradeoffs, innovators are less likely to take their products and services to scale.

DDI Principle #6: Pay Attention to Women

Women produce more than half of the food grown worldwide [2] and work two-thirds of the world's hours.[3] Empirical work in international development has documented time and again that targeting women with new products and services can have large positive effects on family health, nutrition, education, and other measures of welfare. In short, evidence shows that the budgets donors allocate to fighting global poverty will have much greater impact if they focus on women.

DDI PRINCIPLE #5:
Be Smart About Scaling

Scaling requires tradeoffs in the design, manufacturing, delivery, and marketing of products and services. These tradeoffs need to be considered throughout the design and development process.

DDI PRINCIPLE #6:
Pay Attention To Women

Women play a central role in the use of new products and services in poor markets. Keeping gender issues in mind can result in a better product or service, and also greater impact in tackling poverty.

Photo credit: United Nations

DDI advocates the integration of gender issues at all stages of the innovation process. The physical aspects of a product, including its color, weight, and materials, should be designed with an eye towards how women will use it.

Similarly, innovators can err when they design service delivery without considering women's needs. Higher rates of illiteracy among women may make it difficult for women to access a service that requires reading. In addition, household responsibilities can prevent women from traveling long distances to reach a service.

In marketing, DDI considers the household roles of women and men in making purchasing decisions. For some products, men purchase them, but it is women who are responsible for them after the purchase. For others, women are the buyers. If a program trains men in how to operate, maintain, and repair a new product, that knowledge may not transfer to the woman. Additionally, if access to credit is integral to the successful marketing of an innovation, lack of credit availability among women may be essential to consider.

The orange-flesh sweet potato provides a good example of how to integrate women into innovation practices. Every year, 250 to 500 million children become blind from vitamin A deficiency, half of them dying within 12 months of losing their sight.4 The orange-flesh sweet potato was bred to increase dietary intake of vitamin A. But changing behavior around what people eat is particularly hard.

To give this new food the best chance of adoption, practitioners kept gender in mind throughout the innovation process. While breeding the new potato, they tested different varieties with women and children to understand preferences in dryness, color, sweetness, and many other characteristics. They employed women in the distribution of the sweet potato cuttings and the formation of local producers groups. Practitioners also targeted their marketing materials to women, explaining the potato's nutritional benefits suggesting ways to use the potato to earn money.

DDI advocates careful thinking about women customers. Women use products and services differently than men. Women learn about and access products and services through different channels. They have different constraints that keep them from adopting something new. And a product or service will have different economic value for women than men. DDI ensures that these considerations inform design, development, and commercialization processes.

Practicing Demand-Driven Innovation

People in international development are applying the six principles of Demand-Driven Innovation all over the world. They are making a difference in grants, partnerships, policies, companies, and programs. But so far, DDI practitioners have not connected the dots among their techniques and learnings to form a cohesive set of practices. They also have not had much discussion of common experiences. In this paper and the accompanying website, www.demand-driven.org, we make a first attempt to bring together the practices of DDI and to illustrate when, why, where, and how it works.

The application of DDI principles is different for every project. There isn't any one scaling strategy, one method of engaging the private sector, or one way of approaching gender issues. The six principles of DDI provide a framework that helps people make informed choices about how to support their international development goals. Practicing DDI, then, is about asking hard questions and using the answers to support decision-making in innovation.

We have gathered a list of these DDI questions, acknowledging that many more will be added.[5] These questions can be found on our website, along with stories of success and failure from international development projects. There are questions for every part of the innovation and commercialization process, grouped into six major areas:

- » **Customers**
- » **Products and Services**
- » **Marketing**
- » **Commercialization**
- » **Finance**
- » **Metrics**

Customers

Viewing the beneficiaries of international development policies and programs as "customers" is, in itself, a jump forward from past thinking. The word customer assumes that poor people can and should make decisions—an assumption that was often absent in previous philanthropic work. Today,

when we talk about poverty, we may also, in the same breath, talk about users, commercialization, customers, micro-entrepreneurs, business incubators, and more. All of these terms are a welcome departure from older views of the poor as homogeneous recipients of philanthropy.

Still, we have a long way to go before people in international development widely understand that a woman living below the poverty line in rural South Sudan is as selective as an affluent suburban American mother—and perhaps even more so—when it comes to purchasing food for her family. Instead, the persistent view is that poor people are less discerning about products and services.

Practicing DDI requires first an appreciation of the heterogeneity of people, households, communities, cultures, and environments that comprise your customer base. Second, it requires respect for the business acumen of your customers, who themselves likely run a small business or farm, or manage a household.

DDI also requires taking a step back to map out the larger picture of possible customers other than poor people. Sometimes, for instance, a product or service is *purchased* by one set of customers (e.g., local hospitals), but *used* by another (e.g., patients). A first, useful question about customers is thus:

> *Who exactly are my customers? Are they individuals, families, groups, communities, companies, government agencies, donors, or someone or something else?*

Most likely, your product or service has a number of possible customers, and you will benefit from understanding how these people and forces interact and affect what you are trying to do.

In international development, you might also ask:

> *Do my social or environmental priorities align with my customers' interests?*

For instance, when Practical Action UK, an international NGO, decided that a "fireless" cooker would be a good way to alleviate health and environmental problems in rural Kenya, they were aligning their work with the interests of funders and other stakeholders. It was not obvious at the time whether the customers the NGO hoped would adopt the new cookers shared its health and environmental goals. The NGO failed to ask: Are rural Kenyan women willing to change the way they prepare food in exchange for the proposed benefits of the new stove?

Practical Action UK's website describes fireless cookers as "a simple insulating covering that allow pots to continue to cook food even when they are taken off a source of heat." Although the cooker seemed to have clear health and environmental benefits, it had little success in the field. Practical Action UK reported this might be because the women in the pilot project thought the cooker materials were too expensive. Yet when customers were told the cooker could be made from locally available materials, there was still low uptake.[6]

Practical Action talked to its customers, documenting the many reasons why women did not adopt the cooker. They learned that asking women to adapt their cooking techniques to low heat proved difficult.

The fireless cookers were unpopular because their design did not take into account the needs and constraints of their intended customers, who in this case were mostly women.

To keep gender issues in mind, DDI practitioners might ask:

Do my male and female customers have different preferences?

Discovering customers' preferences takes time and money, of course, and so a related question is:

What's a cost-effective way to understand my customers' preferences?

In many places around the world, just having the better product is not enough to move it to markets. Innovators might also ask:

How do I earn my customers' trust?

Sam Dargan, founder of Great Lakes Energy, a Rwandan company that provides solar lamps to millions of rural households throughout East Africa, said that he had difficulty gaining customer trust when he first started his business. Potential customers may have wanted to replace dangerous and expensive kerosene- or diesel-powered light sources. But they were reluctant to invest scarce resources in unfamiliar products sold by a company they didn't know.

"We would arrange a meeting with villagers through a local leader to sell our solar lamps, and a few people would buy them," said Dargan. "But it wasn't until a solar lamp broke and others saw that our company would fix it, that we gained wider trust and more customers." Dargan believes "trust takes time" and requires "visible, time-tested customer service." [7]

Other questions to ask about customers when practicing DDI are:

How could my customers' beliefs, values, or customs affect the adoption of my product or service?

How are my potential customers already meeting the needs my products or services would address?

What other companies, NGOs, or government agencies are providing similar products or services?

And how do I know how many customers would want my product or service?

GADCO, a Dutch-based agricultural food company working in Ghana, came to ask many of these questions. One of the company's first projects was to produce and sell locally grown, high-yield rice, to reduce reliance on Asian imports.

"At first," said Iggy Bassi, GADCO's co-founder, "we tended to conceive of African consumers as not having the same consumer desires—in terms of taste, marketing, price point, etc.—as Western consumers. ... The thinking was, 'Just produce food and people will eat it.'" But GADCO soon discovered that Ghanaian customers were highly discerning. They preferred different grades, varieties, and national origins of rice for different dishes and occasions.

To understand customer preferences, the company partnered with a Ghanaian distributor to conduct extensive market testing. "Our partner brings in 50 women from the market, cooks different varieties of rice, and asks them what they like," said Bassi. GADCO used the results of these blind taste-tests to develop more attractive brands. "You can get all kinds of local seeds that, say, grow in upland conditions and require less water," said Karan Chopra, GADCO's head of strategy and business development, but "if people don't want to eat that rice, it's useless." [8]

Products & Services

Tailoring a product or service to the needs of customers in poor communities is no easy task. As designers attest, a successful product or service is informed by both customer feedback and facts about the landscape in which it will be manufactured, distributed, sold, and used. Authentic customer feedback can be difficult and expensive to get and interpret. And many aspects of design require cultural, physical, socioeconomic, linguistic, and political understandings.

In addition, designing a product or service should not be divorced from planning how to market, commercialize, and monitor it. And so good product- and service-creation teams include people with diverse professional backgrounds, disciplines, skills, and personal experiences—from ethnography to business, from engineering to industrial design. Building teams with this interdisciplinary range is even more challenging when delivering products and services to poor markets, which require additional knowledge of local cultures, policies, market channels, and regulations.

Some questions to ask when designing demand-driven products and services are:

How can I get affordable customer feedback and then use it to improve the design of my product or service?

What can I learn from products and services already in the market?

Do I need to design a new product or service, or create a new business model for an existing innovation?

One U.S. company that asks these kinds of design questions is D-Rev. The nonprofit created a low-cost, high-quality, advanced phototherapy device, Brilliance, to treat jaundice in newborns in India hospitals, where many untreated babies suffer brain damage or even death. D-Rev's design process was based on extensive "need finding" and market due diligence. Its design team studied the phototherapy products already in the Indian market and sought input from Indian doctors, nurses, and medical product designers, as well as from experts at Stanford University School of Medicine. The design team also looked at the whole problem of jaundice management in Indian hospitals, including how it is currently detected and treated, as well as the local constraints that result in hospitals not having something so basic as a phototherapy device.

D-Rev CEO Krista Donaldson and her colleagues also completed the final stages of the device's design in partnership with Phoenix Medical Systems, one of India's largest medical product companies. Because of Brilliance's advanced technology and low cost, Phoenix offered D-Rev a licensing deal to manufacture, distribute, and sell Brilliance to Indian and international hospitals. As part of the licensing deal, the product is sold publicly at a fixed price, to promote transparency and consumer trust with purchasers. And to increase its social impact, the nonprofit takes lower royalties on product sales to its target customers: rural public hospitals. "This is how we align our goals of social impact with our partner's goal to make higher profits," said Donaldson.[9]

Other DDI questions about products and services include:

What complementary products and services does my innovation require?

How much should I charge?

How will I balance affordability with my organization's sustainability or profit goals?

And what are the risks to my customers if my product or service fails?

One example of a costly product failure is PlayPumps Water Systems, manufactured by the South African company Roundabout Outdoor. The deep-well water pump, designed to look like a playground merry-go-round, uses the energy of children at play to turn the wheel and pump the water. In 2006, Roundabout's ingenious idea attracted tens of millions of dollars of philanthropic and U.S. government funding. PlayPumps, which Roundabout priced at US$14,000 each, were soon installed near thousands of primary schools in South Africa and Mozambique.

But for-profit Roundabout and nonprofit PlayPumps International did not adequately monitor and maintain the pumps. When the pumps broke and no spare parts were available, some communities ended up with no water supply. In other cases, children lost interest in the play pumps, leaving adults, especially women, no option but to pump water on a system that was hard to use because it was designed for children. [10]

Marketing

Even the best products and services rarely sell themselves. Marketing is always a mix of informing customers about new products and services and persuading them to try them. But marketing products and services to poor communities—where illiteracy rates are high, multiple languages are spoken, transportation is often challenging, and advertising channels are culturally and technologically very different—raises a host of necessary, though infrequently asked, questions.

They include:

Through what channels do my customers get information about products and services?

What information sources do my customers trust most?

How will I show customers how my product or service works, rather than just telling them about it?

How will I market to different communities in different languages and at varying literacy levels?

Does the packaging of my product fit the market I'm serving?

How will I compete with counterfeits of my product or service?

An example: The EU's All African, Caribbean and Pacific Agricultural Programme and the World Bank financed the introduction of a Brazilian company's coffee-washing product to the Ethiopian market in 2010.[11] Within a few years, an Ethiopian company copied the machines and started selling them for half the price. There was little the Brazilian company (Pinhalense) or the EU programme could do about this breach of intellectual property.

"You have to go into the market with the possibility of knock-offs in mind," said Bob Rabatsky, director of Feed the Future Partnering for Innovation, a USAID and Fintrac Inc. program focused on commercializing agricultural technology to help smallholder farmers. "Most developing countries have poor intellectual property protections. So you have to make your money not from IP, but from selling your product at a price that makes sense for the market." Rabatsky added, "If the Brazilian company had gotten into the Ethiopian market earlier, it might have been able to set up local manufacturing, sales, and after-sales service networks as part of its business plan." [12]

Sales networks are the foundation of Solar Sister, a U.S. nonprofit that enables women across sub-Saharan Africa to create solar product micro-businesses. The nonprofit follows the Avon model of direct sales. It identifies entrepreneurial women in rural areas who want to earn money from selling to other women in their community.

Solar Sister CEO Katherine Lucey said she started her enterprise because she noticed a marketing and selling gap: she realized when it comes to household products like lamps and phone chargers, "You need to have women involved in every step of the process, since in many cases they are your customers." Lucey also realized women are better able to communicate with their female customers about the potential benefits of the products, and thus get more clean-energy products into more homes.

But Lucey noted that finding saleswomen was sometimes challenging, especially since Solar Sister is a U.S nonprofit that works largely like an African business. "I was invited to a community in rural Tanzania, and hoped there would be about 10 possible female entrepreneurs selected by the grassroots worker," remembered Lucey. "But when I arrived, there were 70 women. So my colleagues and I did the training. Then, at the end of the day, each one asked for her "transportation money." I suddenly realized that I hadn't distinguished my enterprise from one of the big NGOs, which provide villagers clean energy products, often free, as well as tea, lunch, and a 'sitting fee' and transportation fee. Most of the women who came to hear about our products and service were looking for quick benefits, not a business solution, and I hadn't communicated the service role of my organization," as compared to typical western NGOs.

This experience made Lucey realize that she needed to understand not just how to sell her products, but also how to market her organization in the communities she wished to serve.[13]

Commercialization

Commercialization—the process of getting innovations into the hands of people who want and need them—isn't easy anywhere in the world. But in poor markets, figuring out the best way to fund, manufacture, distribute, fund, sell, maintain, and scale products and services can be particularly tricky. Questions successful DDI practitioners ask about commercialization are:

How and where should I manufacture my product?

What distribution model—franchises, local salespeople, selling through other outlets—should I use or create to move my product or service to market?

Can my product or service eventually be commercialized without subsidies or philanthropic support?

How will I work with local, national, and international governments to move my product or service to market?

Design That Matters, a U.S. design incubator that creates products for customers in poor countries, has spent the last decade contemplating these kinds of questions. Recently, the nonprofit focused on testing, developing, and manufacturing a medical device in Vietnam.

"The assumption was that Vietnam was a good proxy for other countries in Southeast Asia," said CEO Timothy Prestero. Vietnam has no laws protecting people from personal injury or harm (or tort laws). This made in-country sales and exports efficient, but it did not solve the nonprofit's hurdles for exporting to other countries. Exporting the device to India, for example, presented numerous difficulties because, said Prestero, "India has 28 states, which means it's essentially 28 countries," each with its own import laws and restrictions. Looking back, Prestero said it might have been better to work with a multinational distributor because exporting medical devices out of the wealthier countries of the Global North can be easier.[14]

Other crucial questions for the commercialization of products and services are:

How do I select the best partners to do business with?

What in-country partners do I have to help me comply with labor and environmental standards, observe import and export laws, and navigate other regulatory issues?

What spare parts, staff, or infrastructure will my venture require?

After much research and investigation, Simgas, a Netherlands biogas company, decided that the best way to commercialize its products was to set up a joint venture in Tanzania. Biogas systems, which break down organic matter and produce energy, have long been seen as a clean energy solution for the developing world, but their construction is unwieldy and expensive.

"You need to train an army of masons" to build and maintain biogas systems, said Sanne Castro, CEO of Simgas. To solve that problem, Simgas designed lightweight, customizable organic waste processors for its rural customers, and hired field officers who could help train customers and provide regular maintenance.

For its urban customers, who purchased household biogas stoves, Simgas offered an equally high-touch customer support system, which included house visits, daily service calls for the first two weeks after installation, and follow-up calls thereafter. To make the products affordable, Simgas prearranged microloans with a Tanzanian microfinance institution, which allowed customers to buy the stoves and systems on a purchase plan.

Castro said among Simgas' greatest commercialization challenges was distributing biogas products in a country where the founders had no network and little experience, especially because they were

Photo credit: United Nations

planning to mass-produce the biogas systems locally in a plastics factory. Sanne and his brother, Mirik—engineers by training, not businessmen—created a list of possible Tanzanian joint-venture partners. They did due diligence by talking with representatives from a Dutch bank in Tanzania, the Dutch Embassy, and with other foreign companies doing business in Dar es Salaam.

Eventually, Simgas settled on Silafrica, a large plastics processor in East Africa, which clears the importing of raw and prefabricated material into Tanzania. The Tanzanian partner is also responsible for the Tanzanian paperwork for registration of the company and they have helped arrange property and permits for building and manufacturing. When needed, they also helped in sourcing senior staff and making sure Simgas understood how Tanzanian labor law works. "Both partners contribute where our strengths lie," explained Castro.[15]

Finance

These days, capital for ventures targeting poor markets can come from a wide variety of sources, including social investment funds, foundations, aid agencies, banks, corporations, angel investors, private equity investors, and venture capital investors. But the increasing number of capital sources doesn't mean that raising money for demand-driven products and services is easy. Because innovators are faced with many more options for financing, thinking strategically about capital sources has become more important.

Indeed, many of the entrepreneurs and innovators we spoke to said that financing opportunities are far behind design, marketing, and commercialization opportunities. One interviewee explained that this is because "foundations are risk-averse, international agencies don't understand what

social entrepreneurs do, and individual donors tend to be attracted to 'shiny objects'"—projects whose designs are cool or tug heart strings, but don't fill gaps or tackle intractable problems.

Questions not to be avoided when considering finance options include:

What corporate structure best fits my finance options?

What finance sources will support the growth of my venture?

Will my product or service need subsidies to make it affordable?

What risks come with different finance sources?

One cautionary tale came from Sam Dargan, founder of Great Lakes Energy, a solar lamp and photovoltaic system business in Rwanda. To scale up sales of its solar solutions to rural customers, Great Lakes Energy received a two-year, $200,000 grant from an international lender. The grant allowed Great Lakes to rapidly expand its dealer network, offer more credit to customers, and launch a countrywide marketing campaign.

Yet Dargan lamented, "The removal of capital barriers created a self-destructive cycle," which resulted in low-quality dealers, an overstock of lamps, and weak customers. The experience taught him that "it's better to grow slowly than to spend time trying to get grants and donations," he said.[16]

Other organizations have found it impossible to grow without multiple sources of funding. Simgas, the Dutch biogas company, decided to subsidize its work through Dutch government grants and EU carbon credits.[17]

Still other organizations have pioneered altogether new financing strategies. Riders for Health is a nonprofit that maintains health transport vehicles in sub-Saharan Africa. To grow its operation in Gambia, Riders received a $3.5 million loan from Nigeria-based GT Bank in 2002 to purchase a fleet of motorcycles, with the Skoll Foundation agreeing to pay the loan in case Riders defaulted. Riders repaid the bank loan with fees collected for the health services it rendered to the Gambian government.[18]

Vestergaard Frandsen, a Swiss company innovating health products for low-income communities, also developed a complex financing model, called "carbon for water," to distribute its LifeStraw household water filtration product. Because LifeStraw users would presumably not need wood to boil water, Vestergaard Frandsen argued that its product would reduce carbon emissions from burning wood. In 2011, the company received enough carbon credits to distribute 900,000 water filters to approximately 90 percent of households in Western Kenya through a partnership with the Kenyan Ministry of Health.[19]

Yet some critics, such as Kevin Starr, managing director of the Mulago Foundation, have criticized the $30 million, 10-year effort as a misuse of carbon credits, because boiling water is not as common as Vestergaard Frandsen claimed. Starr argued that the company's model was a false way to scale up, subsidize, and distribute its product.[20] Others believe Vestergaard Frandsen's carbon financing model is an innovative way to scale up clean water devices.

Metrics

The capacity to capture and process data is growing, and new methods for measuring impact are being invented. Yet understanding social, economic, and environmental change data is complex. It requires decisions about what to measure, and how and when to do it.

In this rapidly changing landscape, practitioners of Demand-Driven Innovation need to ask questions such as:

How will I prove whether or how often my customers are using my product or service?

What metrics can I use both to improve my operations and to show stakeholders whether my product or service is working?

How can I make measurement and evaluation more cost-effective?

How will my measurement needs change as delivery of my product or service scales?

For example, Design That Matters, a nonprofit U.S. product incubator, wanted to make sure hospital nurses in India were correctly implementing its phototherapy device for jaundiced newborns. To monitor use, the Design That Matters team installed a button on the prototype. Every time a nurse checked on a baby, she was instructed to push the button.

But CEO Timothy Prestero and the device's other designers soon realized that the button was becoming the focus of the nurses' attention, not the patients. "To keep up with expectations," Prestero said, "the nurses were going around pushing the buttons." The buttons were removed from the prototype, and Prestero and his team had to switch to another method to measure infant monitoring.[21]

Data from wireless sensors has long been a part of the for-profit business world. These tools are increasingly being adapted to innovations in developing and emerging markets. After witnessing infighting among development practitioners about how best to cull product usage data, Evan Thomas, a Portland State engineering professor, created a sensor both to monitor usage and to relay those data to a website.

Thomas' SweetSense monitors have been installed on cookstoves to monitor gas emissions and thermal efficiency, on household water treatment systems to monitor frequency of use and flow rate, and on handwashing stations, latrines, and rural infrastructure. The sensors "are telling us things that are different from our surveys," said Thomas, especially about sensitive behaviors like hygiene.

Humanitarian organizations, he added, can now use these data both to improve their products and services and to prove their effectiveness to funders, partners, and other stakeholders. For example, SweetSense is being used to monitor Vestergaard Frandsen's provision of LifeStraw water filters to 900,000 homes in western Kenya. Data from the monitoring will show how often people are using the filters and how well the filters work.

Another organization using sophisticated measurement tools is Del Agua Health, a UK nonprofit founded in 2012 to combine international carbon finance with public health technology in developing countries. Del Agua has relied on surveys conducted by Rwanda's community health workers to track 3 million people's use of cookstoves and water filtration systems.

"Because we know this form of data collection can be biased," said Christina Barstow, consulting program manager of Del Agua, "we introduced remote sensors as a way to get more objective measures." Barstow hopes that as the project in Rwanda scales, remote sensors will be increasingly available and used. "Sensors let you iterate on your methods," she said. "The data can lead to both better measurements and better survey questions."[22]

Conclusion

Demand-Driven Innovation is the practical translation of business practices so that poor customers worldwide can get better products and services. Although we focus here on innovations alleviating poverty, the same DDI principles apply to other areas, such as clean energy technologies with environmental goals. Our hope is that donors will begin to see the opportunities DDI offers for increasing the efficiency and impact of their work.

DDI is characterized by its results-oriented advice and lack of doctrine. The driving question of the practice is simply: How do you improve more people's lives in low-income communities with better innovations? Implicitly, that requires donors to spend more wisely on smarter technology development and distribution, with a careful eye toward scaling and gender issues. But DDI doesn't push any one of these goals forward as an end unto itself.

Similarly, DDI's application of business practices to international development is not rooted in private sector dogma. Instead, it involves carefully translated processes, concepts, and thinking that can improve how triple-bottom-line innovations impact global poverty.

As a body of shared knowledge, DDI itself requires investment if it is to advance international development. Existing practices need to be gathered more broadly and common experiences need to be shared. But most important, there is great value in developing a set of tools that can help donors, policymakers, and practitioners use DDI. These tools could include:

» **Due diligence processes for different stages of product development**

» **Practical guidance on intellectual property strategies**

» **Analysis of standard business models for deploying innovations in low-income communities**

» **Analysis of marketing techniques and strategies for reaching both the urban and rural poor;**

» **Decision-making tools for navigating public-private sector issues, so that DDI practitioners can better leverage private sector resources while preserving public-interest goals**

» **Commentary on how and when to use different financing mechanisms**

» **Decision-making tools for major issues in the innovation process, such as gender and scale**

» **Shared practices in cost-effective measurement**

As these tools emerge, more organizations will adopt DDI principles. With continued sharing of experiences, we can expand our understanding of how to get better at the design, development, and deployment of products and services that both serve poor customers and help alleviate poverty. Then we can really begin to change how we think about innovation in international development.

[1] Low-income countries' average per capita spending on health in 2009. OECD average per capita spending on health in 2010. From: *WHO Global Health Expenditure Atlas, April 2012*.

[2] *Gender and Food Security, Synthesis Report of Regional Documents: Africa, Asia and Pacific, Europe, Near East, Latin America*, Food and Agriculture Organization of the United Nations

[3] *"Combating Discrimination Against Women,"* United Nations, OHCHR, 2009.

[4] Joan Webster-Gandy, Angela Madden, and Michelle Holdswort, eds., *Oxford Handbook of Nutrition and Dietetics*, Oxford: Oxford University Press, 2012.

[5] The questions and anecdotes found in this paper are culled from interviews with 20 representatives of nonprofits, companies, philanthropies, and international agencies during March and April of 2013.

[6] Vincent Okello, *Fireless Cooker*, Practical Action Eastern Africa, Feb. 6, 2013.

[7] Interview with Sam Dargan of Great Lakes Energy, March 13, 2013.

[8] Interview with Iggy Bassi and Karan Chopra of GADCO, March 11, 2013.

[9] Interview with Krista Donaldson of D-Rev on March 22, 2013.

[10] "*South Africa: Troubled Water*," Frontline/World, June 29, 2010.

[11] CABI and PACA, "*Technical Assistance to Introduce Improved Coffee Washing Technology*," March 2012.

[12] Interview with Bob Rabatsky of Feed the Future Partnering for Innovation, March 28, 2013.

[13] Interview with Katherine Lucey of Solar Sister, March 13, 2013.

[14] Interview with Timothy Prestero of Design That Matters, March 15, 2013.

[15] Interview with Sanne Castro of Simgas, March 21, 2013.

[16] Interview with Sam Dargan of Great Lakes Energy, March 13, 2013.

[17] Interview with Sanne Castro of Simgas, March 21, 2013.

[18] Sonali Rammonhan, "*Fueling Growth*," Stanford Social Innovation Review, Summer 2010. Web. June 24, 2013

[19] Reynard Loki, *Carbon for Water: A New Sustainable Finance Model Saves Lives and the Environment*, JustMeans.com, June 3, 2012.

[20] Kevin Starr, "*Thirty Million Dollars, A Little Bit of Carbon, and A Lot of Hot Air*," SSIReview.org, June 16, 2011.

[21] Interview with Timothy Prestero of Design That Matters, March 15, 2013.

[22] Interview with Christina Barstow of DelAgua Health and Development Programs, April 18, 2013.