The BoP
Market for
Drip Irrigation

READY FOR BUSINESS
Our Vision

We’re working toward a world where smallholder farmers have access to the same drip irrigation technology as commercial farmers. But experience has shown us that technology alone is not enough. There are barriers to adoption, which are identified and quantified in this market research. We’ve brought other products to scale in the developing world: pumps, latrines, and water filters. By working together, we can do it again.
Drip irrigation has transformed commercial farming all over the world, increasing yields and reducing water consumption. At iDE we’ve also seen drip irrigation work with smallholder farmers. And we are asking ourselves and industry experts: How can we bring this technology to millions who need it? Our research shows not only the potential to reach even greater scale, above and beyond the 150,000 we have reached, but also points the way to overcoming the most entrenched problems in reaching that scale.

Tim Prewitt
iDE
Chief Executive Officer

Pockets of Impact
Promising signs from different approaches.

Below are three highlights from our global operations. We have seen success by taking different approaches for each context.

Nepal
Facilitation Model
In remote and isolated pockets of Nepal, IDE connects farmers who are growing and selling high-value crops to a steady pool of suppliers and buyers. In these newly formed “Commercial Pockets,” farmers generate sufficient volume to wield negotiating power with traders. This helps raise their incomes, while providing an avenue for access to new technologies and technical support. Over 150,000 smallholder households in Nepal are now connected to Commercial Pockets.

Zambia
Private Extension Services Model
In Zambia, IDE selects and trains independent entrepreneurs called Farm Business Advisors (FBAs) who sell, on commission, a range of agricultural inputs and products with technical advice to farmers. Currently, over 200 FBAs serve over 14,000 households. The FBA business model has evolved significantly from offering mainly equipment to more comprehensive support with inputs, credit, advice, and output marketing.

Nicaragua
Social Enterprise Model
In Nicaragua, IDE’s social enterprise, IDEal Tecnologías, sources appropriate irrigation technology and employs technicians that support a network of retailers selling drip irrigation kits and technical advice. IDEal has identified lead farmers and cooperatives as the most successful retailers and is tailoring a business model around these strong micro-enterprises.
More than 1 billion people currently live in water-scarce regions. As many as 3.5 billion people could experience water scarcity in the next 5 to 10 years.

By 2050, crop yields in the world’s southern hemisphere are predicted to decrease by 54% due to climate change, while 60% more food will be needed.

The majority of crop growth is expected to come from increased yields on the same land. This will be attributed to three areas of growth:

- Advances in and implementation of technology, including drip irrigation, fertigation, and climate resistant seed strains
- Mentality shifts and training
- Improved finance options
It is estimated that a mere 4% of all arable land is under irrigation in Africa, leaving over 211 million hectares of farm land under rainfed cultivation.

Huge Untapped Markets
A shared value opportunity for the irrigation sector.

Africa’s Potential
A $21 billion dollar market.
The business opportunity for smallholder farmers, local entrepreneurs, and international companies is substantial.

The size of the potential market in Africa.

There are 420,000 km² of irrigable land if an additional 1% of irrigable land gets drip. The average farmer plot size is 500 m², and the average retail cost is $250. The sector could generate upwards of US $21.1 billion in revenues and sell 84.6 million drip irrigation kits.
Irrigation Makes a Difference
What can we expect from irrigation?
Irrigation can offer crop yields that are two to four times greater than is possible with rainfed farming.

Cereal Production Improves With Irrigation and Inputs

Drip irrigation has the potential to reduce water use by as much as 33% while increasing output by 30 - 90%. The labor savings is compounded, especially for women, by increased time dedicated to selling crops.

Benefits of drip:
- Labor savings, water does not need to be hauled or directed in the field
- Reduces irrigation water requirements
- Reduces water pumping requirements, saving energy and energy costs
- Reduces weed growth, reducing labor and chemicals required to manage weeds
- Improves fertilizer application
- Reduces the risk and spread of crop disease

Sources: World Watch, FAO, World Bank
**Increased Income**

Smallholder farmers see boost in income.

Experience shows that farmers earning $4.40 could increase their daily income to $10 a day through access to, and use of, better farming practices.

### Impact of Drip, Inputs & Technical Assistance on Farmer Earnings in Cambodia

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<td>Fertigation</td>
<td>High Value Crops</td>
<td>Technical Assistance</td>
</tr>
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"I have a dream. With the increased income I will gain from drip irrigation, I want to open a school for cattle farming and vegetable farming and pass my knowledge to the next generation."

Serge Pasteur Bobiné  
Smallholder Farmer  
Burkina Faso
For drip to scale, we must unleash a new class of micro-entrepreneurs who can make a profitable business of selling, training, and providing services. While a value chain analysis forms the foundation, we also need a deep understanding of the factors that drive business. Here we introduce our five Ps of marketing: perception, product, price, promotion, and place.

5Ps: Perception
Smallholder Mindset

Personal relationships are an important influence in smallholder purchasing decisions.

Perceptions That Influence Purchase Decisions

<table>
<thead>
<tr>
<th>Perceived Influence</th>
<th>Weighted Average Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peer Influence</td>
<td>4.14</td>
</tr>
<tr>
<td>Price</td>
<td>4.10</td>
</tr>
<tr>
<td>Face-to-face contact</td>
<td>3.90</td>
</tr>
<tr>
<td>Personal service</td>
<td>3.84</td>
</tr>
<tr>
<td>Quality</td>
<td>3.97</td>
</tr>
<tr>
<td>Brand loyalty</td>
<td>2.92</td>
</tr>
<tr>
<td>Lack of knowledge</td>
<td>2.71</td>
</tr>
<tr>
<td>Unofficial assistance</td>
<td>2.40</td>
</tr>
</tbody>
</table>

Based on questionnaire responses of 80 global senior staff.
Average weighted scores are on a scale of 1 to 5.

Peer, face-to-face contact, and personal service are important factors for drip distribution and technical assistance to scale.
GOING TO SCALE

5Ps: Perception
Benefits of Drip Not Understood

Smallholders perceive drip will save time and water.

Perceptions of the Benefits of Drip

The strongest perceptions of drip among smallholders revolve around time and water-saving measures, and to a lesser extent, increase in yield and crop quality.

The lack of understanding of the full range of benefits of drip irrigation present a tremendous marketing and promotion opportunity.

We must educate on the income generating benefits that drip irrigation presents to smallholders.

Naty Barak
Netafim
Chief Sustainability Officer

Based on questionaire responses of iDE’s global senior staff.
Average weighted scores are on a scale of 1 to 5.

Naty Barak
Netafim
Chief Sustainability Officer

The private sector cannot ignore the 500 million smallholder farmers – providers and clients, who produce 80% of the food for the developing world. Drip irrigation plays a significant role in raising farm productivity. The poverty cycle can be broken and a progressive transformation from subsistence farming toward commercial farming can commence.
5Ps: Product
Why Smallholders Buy
Purchase criteria may change over time as smallholders are educated on the full benefits of drip irrigation technology.

Purchase Criteria

- Price: 4.71
- Ease of use: 4.06
- Quality of the product: 3.75
- Training: 4.00
- Financing options: 3.69
- Availability of installation services: 3.75
- Technology package: 3.75
- Agroinput support: 3.69
- Lifespan cost: 3.69
- Ability to negotiate price: 3.69
- Supplier's knowledge of the market: 3.75
- Time to set up: 3.75
- Relationship with supplier: 3.69
- Uniqueness of the product: 3.75
- Story related to the product: 3.75
- Packaging: 3.69

Price remains the strongest purchase criteria, driven by a lack of understanding of the full benefits of drip irrigation technology.

Obstacles to Accessing Irrigation Technology

- Price and lack of financing options are some of the largest obstacles to smallholder farmers accessing irrigation technology.

5Ps: Price
Price & Access to Finance Options
Price sensitivity is driven by lack of product understanding.

- Price: 4.33
- Knowledge of benefits of the product: 4.00
- Availability of financing options: 3.91
- Availability of product: 3.62
- Distance to purchase location: 3.83
- Distance to water source: 3.38
- Political constraints: 1.78

Based on questionnaire responses of iDE’s global senior staff. Average weighted scores are on a scale of 1 to 5.
5Ps: Price
Price & Access to Finance Options

Product and price should be adjusted to the market environment, in conjunction with systematic efforts to improve access to finance.

Based on questionaire responses of iDE’s global senior staff. Based on interviews with iDE’s global senior staff and industry experts.

Source: World Bank Global Findex, Mix Market

Access to finance must be solved at the country-specific level.

Willingness to Spend on Irrigation Systems for 250m² of irrigation

<table>
<thead>
<tr>
<th>Large farms (+5 hectares)</th>
<th>Medium farms (3-5 hectares)</th>
<th>Small farms (0-2 hectares)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0</td>
<td>$100</td>
<td>$200</td>
</tr>
</tbody>
</table>

7Ps: Price
Price & Access to Finance Options

Agriculture related micro-irrigation is not working in India. It is not economisically feasible for microfinance to target smallholders.

- Microfinance is also subsidized by government subsidies.
- Availability of funds is a major constraint for smallholders who want to access irrigation technologies. The microcredit system does not really work in Nicaragua.
- The government sees the credit system as something capitalistic and American.
- There is success with cooperatives who create guarantee funds where every member of the cooperative pays an amount into the fund.

Seven Countries Compared on Financial Inclusion Indicators

<table>
<thead>
<tr>
<th>Country</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ghana</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nigeria</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bangladesh</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>India</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Honduras</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nicaragua</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rwanda</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This diagram reveals similarities and differences between seven countries on the following financial indicators: interest rates, percent of the poor population with an account at a financial institution, and percent of financial products that are geared toward agriculture.
5Ps: Promotion
Influencing Smallholders

Last mile communication remains a major obstacle.

GOING TO SCALE

WHO DO SMALLHOLDERS TRUST?

Burkina Faso: Opinion leaders such as village bosses, religious people, or technical agents have a high influence on smallholders.

India: Lead farmers need to be in the BoP segment, otherwise smallholder farmers won’t relate.

Nepal: Teachers and senior citizens have high influence.

Africa: Lead farmers can be bigger farms.

By focusing on farmer training and education, we at Toro Micro-Irrigation have enabled the successful adoption of drip irrigation technologies by thousands of smallholder farmers in developing economies around the world. We owe that success to the application of practical and purposeful Human-Centered Designed drip irrigation solutions that generate value for smallholder farmers and their families.

Eduardo Mendias
The Toro Company
Senior Global Development Manager, Sustainable Agriculture

Channels That Deliver Influence

Country and region-specific culture results in variances in influencer groups for smallholders. Regionally relevant lead farmers and opinion leaders could reduce face-to-face training costs.

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Based on interview with iDE’s global senior staff and industry experts.

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**5Ps: Place**

**Distributing to Smallholders**

Smallholders shop most frequently at agricultural input stores. We must consider leveraging these pre-existing distribution channels to increase the footprint of information and materials reaching smallholders.

“Jain believes it is necessary to develop capacity building and training programs to be successful in working with smallholder farmers. Showing the technology through demonstration plots is a critical way for farmers to understand drip. An integrated approach to give farmers access to markets, training, and finance must be packaged together.”

Dr. Dilip Kulkarni  
Jain Irrigation Systems  
President, Agri-Food and Sustainable Agriculture

**Priority Distribution Channels**

- Weighted Average Score
- Agricultural Input Stores
- Head of Coop / Lead Farmer
- Kisan / Village Bazaar
- Traveling Sales People
- NGOs
- Geo Biometrics

"Agricultural Input Stores" are a priority distribution channel for every country in the study. But channels in the "Somewhat Important" category should also be considered on a country by country basis. Each of these channels was rated high in various countries.
## 5Ps: Place

### Distributing to Smallholders

Distribution networks vary widely by country.

<table>
<thead>
<tr>
<th>Country</th>
<th>Channel Partners</th>
<th>Strength</th>
<th>Weakness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Honduras</td>
<td>National distributors and local rural retailers</td>
<td>Large footprint</td>
<td>Limited access to smallholders</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>Major distributors with retail stores</td>
<td>Strong presence in bigger villages</td>
<td>No presence in smaller villages</td>
</tr>
<tr>
<td></td>
<td>Kiosks and hardware stores</td>
<td>Semi-strong presence in remote areas</td>
<td>Relatively small footprint</td>
</tr>
<tr>
<td></td>
<td>Rural retailers, lead farmers, and cooperatives</td>
<td>Close relationships with farmers</td>
<td>Travels time and resources to develop</td>
</tr>
<tr>
<td>Tajikistan</td>
<td>Agricultural retailers sell products in village bazars</td>
<td>Specialized in specific agriculture</td>
<td>Farmers send friends or family to bazars,</td>
</tr>
<tr>
<td></td>
<td>products</td>
<td></td>
<td>which is only point of contact</td>
</tr>
<tr>
<td>Mozambique</td>
<td>Commericially oriented farmers</td>
<td>Takes initiatives to go to South Africa</td>
<td>Lack of local distribution infrastructure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>or Zimbabwe to procureequipment</td>
<td></td>
</tr>
<tr>
<td>Cambodia</td>
<td>Input suppliers</td>
<td>Stores on district level, easily</td>
<td>Limited number</td>
</tr>
<tr>
<td>Burkina Faso</td>
<td>Retailers and Farm Business Advisors</td>
<td>Close relationships with farmers</td>
<td>Travels time and resources to develop</td>
</tr>
</tbody>
</table>

At Balton CP, we have implemented an innovative approach in over 25 African countries so far. This approach combines technology, training and agro-support, all centered around state-of-the-art technologies designed specifically for smallholder farmers. In Kenya we are using a unique educational campaign in schools to develop ”Next Generation Farmers,” creating a positive mindset change in the youth.

Tunca Kocyigit  
Balton CP, Ltd  
Commercial Director

Based on interviews with iDE’s global senior staff and industry experts.
Industry Interviews
Drip irrigation manufacturers and distributors

Insightful analysis was collected through in-depth interviews with global leaders.

Manufacturers

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Helvetas Swiss Intercooperation
Project Officer, MIT/WAPRO

Danzig Andalskov
Helvetas Swiss Intercooperation
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Lori Tney
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Field Technical Staff, Agronomist and Supply Chain Manager
The Research

iDE is an international non-profit organization with over 30 years of experience serving the Base of the Pyramid with market-driven solutions. We work globally across 15 countries with more than 900 staff. We focus on creating innovative business solutions to tackle the toughest development problems through the design of products, services and business models.

We are leaders in last mile distribution resulting from our experience in improving smallholder farmer’s access to information, products and markets in a wide variety of contexts.

With 155,000 drip irrigation kits sold to date, we are eager to bring drip irrigation to even greater scales. We see an opportunity for the drip irrigation sector to come together to take on this challenge. Toward that aim, we prepared this study with support from ESPartners, an independent strategy consulting firm specializing in market research.

The purpose of this research was to develop a global look at the problems facing drip irrigation distribution and usage in developing countries, and to size the business opportunity at the Base of the Pyramid. We used both secondary and primary research to identify priority markets and market segments, understand key obstacles to distribution and adoption of the technology, and explore potential solutions to these obstacles.

For further information on the results of this study, please contact:

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References

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Agriculture & Poverty

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