

A report by

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hybrid strategies consulting

SMALLHOLDER FARMERS AND BUSINESS

15 pioneering collaborations
for improved productivity
and sustainability




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ABOUT HYSTRA

Hystra is a global consulting firm that works with business and social sector pioneers to design and implement inclusive business approaches that are profitable, scalable and eradicate social and environmental problems. In order to “be the change we want to see in the world”, Hystra itself is a hybrid consulting firm – a for-profit tool for social change. Since its creation in 2009, Hystra has conducted in-depth sectorial studies on clean energy, safe water, sanitation, affordable housing, nutrition and ICT-based business models for development, analysed winning sales and marketing strategies in micro-distribution, prepared business plans for pioneering inclusive businesses and supported the creation of a social impact fund. In six years Hystra has worked in over 20 countries serving about 50 clients, including large corporations, international aid agencies, foundations, and governments, to support business models that change the lives of low-income communities across the globe.

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This report is part of a larger collaboration to promote social business and entrepreneurship in collaboration with **Ashoka** and **SDC**.

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INTRODUCTION

Productivity-enhancing products and practices can significantly and sustainably increase smallholder farmers' incomes, as well as improve their livelihoods. Yet, they are not adopted as extensively as they should by the world's 1.5 billion smallholder farmers. This study looks at how pioneering companies and organizations have succeeded in enrolling smallholder farmers in productivity-enhancing schemes, sustainably and at scale – either as buyers of produce or sellers of products, services or equipment.

An estimated 1.5 billion people directly depend on small farms for their income,¹ and these farms in turn produce nearly 80% of all food consumed in the developing world.² Smallholder farmers are also among the poorest and most food insecure people on the planet. A striking three quarters of the world's extreme poor - 800 million people - live in rural areas solely off agriculture,³ while nearly half of the world's undernourished people are smallholder farmers.⁴

Smallholder farmer – a definition

How small is a smallholder farmer? We included in this report case studies that work with a range of farm sizes. One third of our case studies deal with very small farmers (i.e. owning less than 2 acres of land or 2 cows). Another third work with farmers owning about 2 acres or 2 cows, and another third with larger farmers (up to 7 acres or cows). These farmers were typically earning \$US 230 to 2,100 net a year from selling their produce, before entering the programmes led by the case studies we analysed.⁵

The challenges facing smallholder farmers are well known. Rural families living off the sale of cash crops have very little material savings and the little they have can be wiped out in a single bad harvest. Smallholder farmers living in remote areas face difficulties accessing both input and output markets. The generations-old techniques, inputs and equipment employed by smallholder farmers are relatively inefficient, and often produce low yields. The vast majority have no titles to the land on which they work, basic market information or any form of training. Consequently, smallholder

farmers are often at the mercy of middlemen, known by predatory names in many cultures around the globe, such as coyotes in Central America or pisteurs (trackers) in West Africa. Compounding these difficulties, as weather patterns become more unpredictable and global food prices more volatile, smallholder farmers are increasingly vulnerable.

Despite this bleak picture, there are reasons to remain optimistic: the adoption of good farming practices throughout the production process alone can have a lasting impact on yields. And there are many innovative products and services that can substantially raise the productivity and incomes of smallholder farmers. For example, the use of higher quality seeds alone can improve crop yields by 50%. Cross breeding of local cows with hybrid species can lead to stronger and healthier livestock that produces 2-3 times more milk. Most smallholder farmers rely solely on rainwater for their crops, while basic irrigation systems could double a field's productivity.

Yet, companies and organizations that strive to introduce these best practices and technologies often struggle to ensure widespread access, adoption and use among smallholder farmers. The latter often say they do not have the cash at hand and need a financing solution adapted to their situation. Possibly a more fundamental reason is a lack of trust, that investing in these products or services will effectively bring them the expected benefits. In many cases, they simply cannot afford to fail.

1 FAO Factsheet: www.fao.org/fileadmin/templates/nr/sustainability_pathways/docs/Factsheet_SMALLHOLDERS.pdf

2 FAO (2011), Save and Grow: A policymaker's guide to the sustainable intensification of smallholder crop production

3 World Bank World Development Report on Agriculture and Poverty Reduction: http://siteresources.worldbank.org/INTWDR2008/Resources/2795087-1191440805557/4249101-1191957549239/Brief_AgPovRedctn_web.pdf

4 FAO, WFP and IFAD (2012), The State of Food Insecurity in the World 2012

5 The only exception is Margarita, which works with farmers owning on average 25 cows, and whose income levels are much higher.

To address these issues, holistic solutions are needed: Products and services need to come with financing solutions and sufficient training to ensure optimal use; increasing productivity needs to come with access to markets; and increasing incomes needs to come with opportunities to grow larger farms and operations. Some pioneering businesses and organizations have found innovative ways to deploy such holistic solutions. After reviewing over 270 organizations globally, we identified 15 of them - corporations as well as NGOs

- that successfully increased the availability, adoption and appropriate use of productivity enhancing products and practices among smallholder farmers, often at very large scale. We analysed their operational, financial, environmental and social performance via field visits and interviews to analyse innovations and best practices.⁶ The 15 organizations we selected for this study operate in over 15 commodities and serve over 2 million smallholder farmers globally.

The key findings of this research and learnings from these case studies are summarized in this report.



6 For more information, see the Methodology section

EXECUTIVE SUMMARY

This report focuses on increasing smallholder farmers' productivity as a way to improve their incomes and livelihoods. Focusing on how farmers can increase their yields and incomes places them in the centre of the change they would like to see. This report strives to demonstrate that smallholder farmers are capable of change and that they should be treated as active partners, rather than beneficiaries. It was written on the premise that they are rational producers and consumers, who aspire to be in control of their own destiny.

The key findings of our research are summarised in this report around three broad sections:

- strategies for creating new value along the value chain
- cost-efficiently, and
- capturing the value created and sharing it sustainably for both farmers and the organizations working with them.

In the *first section* of the report, we discuss strategies that maximize the creation of new value, as opposed to strategies that redistribute the value that already exists. We argue that as more value is created from the start, the more there is to share along the value chain. The analysis of our 15 case studies indicate that focusing on the provision of technologies that increase productivity is the main lever to create value, ahead of value chain disintermediation⁷ or price premium redistribution strategies (chapter 2).

Cutting intermediaries out of the value chain or transferring a market premium to farmers may bring (limited) additional income, but will not transform their life, as they remain dependent on the goodwill and success of the organization they work with. In contrast, providing them with a micro-irrigation system or a hybrid cow has potential to have them earn much higher income, based on their own choices and labour. Technology also has the potential to create momentum that will change things in the long-term: larger and more successful farmers should also be in a better position to negotiate prices and contracts for themselves, empowering them in their dealings with others.

Encouragingly, our findings also point out that the value created by investing into the productivity of smallholder farmers dwarfs the costs involved in having farmers adopting new practices and products.

This is exciting news for the organizations working with smallholder farmers, as it does make business sense to invest in those farmers for the longer term (chapter 1). Finally, we look at what drives farmers' risk aversion and possibly limits the penetration of some interventions. We observe that the proportion of farmers willing to change their methods is not linked to the promise of significant returns or to the level of investments required; but rather to the reversibility of their decision if they are not satisfied with the results (chapter 3). We conclude this section by highlighting that the power wielded by organizations that work with these farmers comes with great responsibility, as they also need to find ways to protect the more vulnerable farmers from failure (chapter 4).

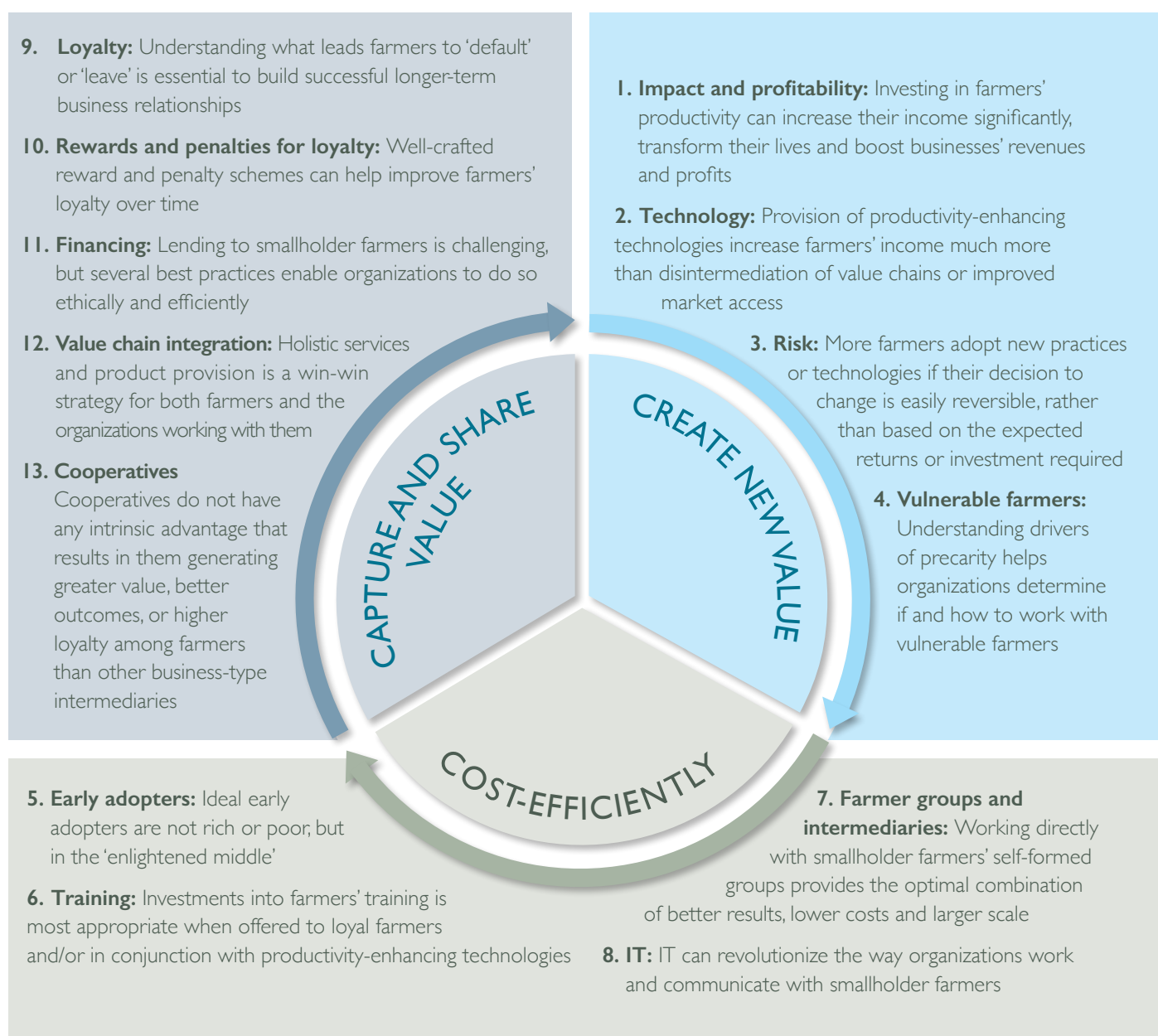
In the *second section* of the report, we discuss how to create new value in the most cost-efficient way possible. We argue that organizations working with smallholder farmers should focus on the entire adoption life-cycle and not just one-shot product sale or harvest purchase. Sustainably building a large base of clients or contract farmers requires:

- a) Identifying the right early adopters and helping them succeed in a way that is demonstrable to other farmers, through tailored and intensive support (chapter 5)
- b) Cost-effective expansion: once the first farmers are enrolled successfully, operations must be engineered for cost-effective scale-up. We discuss in particular the need for training and best practices in deploying it (chapter 6), the options for scaling up operations such as working with independent groups of farmers or through intermediaries (chapter 7), and the way IT can change dramatically the economics of working in rural areas (chapter 8).

⁷ Value chain disintermediation strategies include interventions that aim at shortening and streamlining the value chain, by replacing or consolidating many smaller intermediaries into less players. This can be done for instance by linking farmers with manufacturers (by-passing local traders), or by setting up cooperatives that ensure harvest collection, processing and re-sale of produce in-house (instead of multiple local intermediaries).

In the *third and final* section, we discuss ways to capture and share the value created along the value chain sustainably for both farmers and the organizations working with them, through balanced arrangements and long-term relationships. To operate sustainably and grow, agricultural businesses need farmers to respect their engagements (e.g. refrain from side-selling and repay credit on time), as well as become repeat customers or suppliers. In this section, we first outline what motivates farmer loyalty (chapter 9); and then discuss the various strategies to increase it. This

includes designing a system of rewards and penalties (chapters 10 and 11), or providing holistic services and products (chapter 12). We also discuss the need for 'benevolent' organizations, which guarantee a fair share of the value created to farmers and protect their interest. We found that cooperatives and other farmer-owned intermediaries do not necessarily have intrinsic qualities that would make them outperform other types of organizations in terms of capturing more of the value created on behalf of farmers.



METHODOLOGY

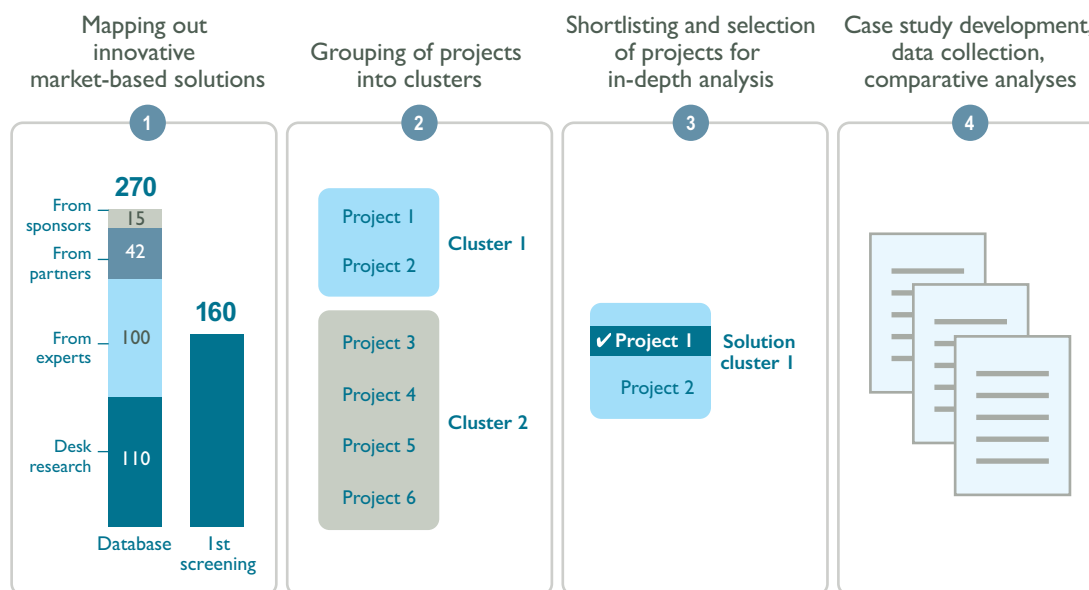
This report follows a methodology that was developed and refined by Hystra in a number of studies and publications. The fundamental idea behind our approach is there is more to learn from analysing successes than analysing problems. Today, many pioneering organizations around the world have found innovative, market-based solutions to working with smallholder farmers and overcome some if not most of the challenges involved in doing so. The findings of this report are based on an in-depth review of the performance and work of 15 of these pioneering organizations. While these findings may not be applicable in all situations, they will hopefully provide inspiration and motivate other organizations.

Our methodological approach can be broken down into four broad steps:

1. Mapping of innovative projects that aim at improving the productivity of smallholder farmers, in a financially sustainable way, worldwide. Through extensive desk research and interviews with 21 experts from think tanks and development agencies, we identified 270 organizations and projects. After removing those which were smaller in size (i.e. working with less than 15'000 farmers) and less sustainable financially (i.e. relying mostly on grant funding), our list totalled 160 projects.
2. Clustering of organizations and projects around selected topics and approaches. Each topical cluster addresses a different set of problems faced by smallholder farmers and thus offers a different set of potential lessons. The clusters are:
 - Provision of inputs, assets and services, with or without financial solutions
 - Contract farming and other schemes buying produce from farmers
 - Large-scale training and certification programmes
 - Value chain dis-intermediation or integration interventions
 - Sector wide efforts to improve pricing, transparency and efficiency
3. Shortlisting organizations within each cluster, to select 15 of the more innovative, successful and sustainable ones. The 15 case studies featured in this report are not necessarily the “best” ones, but rather a sample of the organizations that developed innovative approaches to sustainably work with smallholder farmers, which we could learn from.
4. In-depth analysis of 15 case studies, mostly through extensive due diligences in the field.⁸ A consistent framework was used to investigate all the case studies, consisting of a detailed questionnaire about the organization's history, operations and business model, as well as questions related to its social impact, operational and financial performance, environmental sustainability, and potential for scale and replication (see all case studies, organized along this template in Appendix B). In total, we gathered information on more than 60 qualitative and quantitative indicators. Such a systematic approach allowed us to conduct comparative analyses on a number of focus points (which correspond to our various chapters in the report) to understand why some performed better in some aspects over others and extracted the resulting best practices or lessons learnt. Whenever possible, we used the data from all 15 case studies to conduct our analyses. When the required data was not available, the results were extracted from a smaller sample, as shown in the various diagrams and tables of the report.

8 Due diligences comprised of two to three day visits of field operations and farmers, as well as numerous discussions and interviews with both the management and field teams. In total, we interviewed 77 people across all case studies, not counting numerous discussions with farmers. In two cases (out of 15), field visits could not be conducted in situ and were replaced by series of phone interviews.

Methodology



Disclaimers:

- 1) While this report focuses on ways to build better livelihoods for smallholder farmers, it bears no judgment on whether smallholder farming is a relevant model for agriculture in developing countries. We only observe that a) a proportion of the world's vulnerable smallholder farmers could benefit tremendously from productivity-enhancing products and practices and b) that small farms are there to stay, as the average farm size is decreasing in Asia and Africa.
- 2) We tried to understand the environmental impact our case studies had. However this aspect is not the focus of this report. For instance, we have not done an in-depth assessment of the impact that systematic use of the technologies featured in this report, such as improved seeds, chemicals, hybrid breeds of cattle, would have on the surrounding natural ecosystem. However, we did look at whether the case study organizations ensured the appropriate use of these products and assets (e.g. offering training on fertilizer dosage, or on farming practices that protect soil fertility). In any case, this report is not a proponent of any given technology featured in the case studies, but has selected case studies in light of the best practices that readers could draw from them.
- 3) Because this report is centered on advancing the economic opportunities available to individual farmers, questions regarding the effect of these interventions on the wider market fall beyond its scope. For instance, we understand that helping smallholder farmers may result in some level of consolidation that will likely impact others.
- 4) While we do not claim that the 15 organizations featured in this report are the best worldwide, they are representative of successful approaches scaled up in many different countries, across various commodities. Comparing their performance, approach, learning from both their successes and failures, brought us many insights on what works and why.
- 5) We drew conclusions from a limited set of 15 examples. And in an effort to illustrate the common features among best practices, we have had to overlook some important nuances. For example:
 - We treat smallholder farmers as a homogeneous group, whereas there would be distinctions to make by crop, geography, level of wealth, etc.
 - Given the wide range of commodities covered in the examples we analysed, it is possible that not all lessons summarized here are relevant to all products and geographies.

JAIN Irrigation Systems Ltd.

www.jains.com

India



Providing over 200,000 farmers with holistic farming solutions, including agriculture, water, micro-irrigation systems, pipes, tissue culture, renewable energy based products and appliances, food processing and other agro technologies and technical advice for sustainable agriculture and food chain development

Key insights

JAIN Irrigation Systems Ltd. (JAIN) provides comprehensive solutions to smallholder farmers, bringing them additional revenues while generating more revenues to pay for quality extension services: JAIN does not simply sell products to farmers, it sells comprehensive solutions: prior to any sale of asset or input, in-house field experts assess farmers' soil and climate conditions to guide their purchase, then provide them with continuous support and training. JAIN also provides financing solutions through partner banks and an in-house financial institution. Finally, JAIN has developed a contract farming model offering a minimum price guarantee to farmers, so that it opens markets for the additional crops they produce. This approach creates more value for farmers, while JAIN reduces operations costs by bundling offerings (inputs, equipment, financing, sourcing), and generates multiple revenue streams from the same farmers. This in turn allows to pay for quality in-house support: JAIN has over in-field in-house 500 agronomists and over 500 irrigation engineers in the field to answer any queries from its 200,000 yearly clients, as well as from the 4m farmers it served since 1988. JAIN advocates following self-sustaining agricultural cycle to increase farm production and productivity, increase farmers income, reduce cost of cultivation, protect and enhance environment and biodiversity and develop sustainable natural resources to create sustainable agricultural and food chain for sustainable livelihood.

Investing in selected farmers as 'role models' to encourage adoption of new solutions allows lowering operational costs:

- JAIN has developed its marketing strategy on the basis that 'farmers only believe what they see'. Hence it invests in identifying high potential farmers and turning them into satisfied early adopters, e.g., through free trials or visit trips to its demonstration farms, followed by strong support and monitoring
- JAIN then leverages these 'role model' farmers to lower its operating costs, in two ways:
 - » By triggering word-of-mouth, as they become active promoters of JAIN. They also often play an informal advisory role for fellow farmers
 - » By transforming some of them into official field contact points between neighbouring farmers and JAIN staff, or into new agro-dealers selling JAIN and other non-competing agro-products.

JAIN constantly innovates based on farmers' feedback, and leverages government contracts to recover some of the corresponding costs: In order to keep improving and expanding its offering, JAIN gets direct feedback from the farmers, during trainings, via its dealers, and field staff. JAIN is an innovation-based company spending over 5% of its total revenue in R&D including: improvement of existing product range for the short term; and for the medium- and long-term, new practices and products that help cope with macro changes such as labour shortage or climate change. Lastly, JAIN leverages government-funded or grant-based programs to pilot its new solutions in real conditions; for example it is implementing an automated-irrigation program for 7,000 farmers in Karnataka with government support.

JAIN reaches 100% compliance in contract farming by offering incentives, which it can sustainably pay for thanks to additional value generated in the value chain

- JAIN experiences no side-selling. This 100% compliance rate is made possible by:
 - » Guaranteeing better prices: JAIN purchases farmers' production either at a pre-agreed sales price or at current market price, whichever is the highest at time of purchase. By selling to JAIN, farmers also avoid the 10-15% fees they otherwise have to pay at the local markets
 - » Providing specialized support weekly. Side-selling means losing this support, which farmers value
 - » Arranging transportation for farmers, when they need it. The corresponding cost is then deducted from farmers' payment.
- On JAIN's side, this contract-farming model is sustainable thanks to:
 - » Use of special seeds, e.g. to produce dehydrated onions, JAIN uses a variety developed in house, with higher solid contents (but same price per kilogram on the market), offering higher returns once dehydrated
 - » Sales of micro-irrigation systems, seeds and other JAIN products to its contract farmers, generating additional revenues and value
 - » Cutting the middlemen and saving up to 10% of market price

Description of the project

History / Key milestones:

JAIN was started in 1963 as a small business selling agricultural inputs and petroleum products. Its founder and current chairman Padamshree (Dr) Bhavarlal JAIN has rapidly grown the company into a large wholesaler of equipment for agriculture.

In 1988, JAIN started to work more specifically with smallholder farmers, selling them a range of micro-irrigation systems. Since then JAIN progressively developed integrated approaches for farmers –offering them bundles of assets, inputs, capacity building, financial support, and sourcing directly from them.

Today, JAIN counts 9,000 employees, sells products across 140 countries and manufactures in 15 countries, and is a world leader in many sectors, e.g. irrigation systems (2nd producer globally); pureed mangoes (1st producer globally); or dehydrated onions (3rd producer globally). It received 232 awards received from various international institutions and governments for its work.

- **Business model:**
- Role of key stakeholders in the value chain

Choice of asset / input	Financing	Asset / input purchase	Cultivation / asset use	Transport / processing	Agro-product sales
JAIN experts recommend assets / inputs based on local conditions	JAIN subsidiary offers loans for JAIN and non-JAIN products Partner banks also offer loans for JAIN inputs. Government gives 50% subsidy on irrigation systems for <5 hectares	Farmers order assets and inputs from agro-dealers, JAIN field experts, NGOs or farmers' organizations	JAIN field experts provide regular training support through planned and on-call visits JAIN also trains over 60,000 farmers at headquarters yearly	JAIN buys outputs from ~5-10% of the farmers it sells irrigation systems to: <ul style="list-style-type: none"> • at guaranteed price under contract farming, or • at market price 	JAIN organizes paying transport for farmers. JAIN processes outputs (purees, frozen fruits...)

- **Value proposition:** JAIN has developed comprehensive agro-solutions starting from either side of the value chain: selling assets that improve farmers' productivity (mainly micro irrigation systems, which represent 46% of its business today, but also solar energy products and machinery) or high productivity inputs (saplings from tissue culture and manure, representing around 1% of JAIN business); or purchasing fruits and vegetables from farmers for food processing and export (which represent 15 to 20% of JAIN business). In all cases, JAIN's offer comes with extensive training to make sure farmers make the most of their relationship with JAIN.
 - » JAIN's main product, chosen by around 200,000 smallholder farmers per year, is "more crop per drop", i.e., improved irrigation systems (from drip irrigation systems to sprinklers) adapted to each farmer's specific needs, allowing for significant productivity gains as compared to traditional flood irrigation practices. Clients purchase not just an asset but the continuous support of JAIN's field experts, before the purchase to assess their needs, and after the purchase in case of any issue (choice of crops, fertilizers, best rotation etc.).
 - » For a typical Indian smallholder farmer with 2 acres of land, an irrigation system would cost ~ \$1,300 and last ~ 8 to 10 years. The Government of India provides 50% subsidies for up to 5 hectares, disbursed (sometimes years) after purchase. JAIN has convinced several Indian banks to provide farmers with loans for such products, generally at ~12% decreasing balance rate over 3-5 years, for up to 80% of MIS costs. Since 2011, JAIN has also launched an in-house subsidiary called SAFL to provide loans for irrigation systems MIS at 9-13% decreasing balance rate, and other non-JAIN agricultural assets at 17% decreasing balance rate, plus 1% processing fee at loan disbursement. Repayment to SAFL matches the production cycle of the asset or inputs purchased. SAFL has provided over \$28m loans to 15,000 farmers so far, and plans for a threefold expansion by 2016.
 - » JAIN also offers improved seeds and saplings to farmers. For onions, JAIN has set up a contract farming scheme in which it supplies improved seeds to 4-5,000 farmers per year (around 5-6,000 acres), and buys back the production (60,000 tons per year, or 50% of its supply for dehydrated onions – to be scaled up to 100% in the next 4 years) at the highest of a minimum price agreed on the date of contract and the market price on the day of purchase, deducting cost of seeds and transportation. For bananas, JAIN sells 60 million tissue culture saplings to 16,000 farmers per year at \$0.27 per sapling (including transport) equivalent to

\$340 per acre. Farmers are required to order their batch 6 months in advance and pre-pay 30% of the price. JAIN buys back the production of 3-5% of them (to be scaled up as JAIN increases its processed banana production and enters the fresh banana market). In both cases, farmers are strongly advised to purchase an irrigation system to reap all the benefits from their improved crops (the system in effect pays back for itself in one harvest with those crops); and in both cases they benefit from close support from JAIN field staff. So far JAIN has contract farming agreements with 5-10% of its micro-irrigation systems clients, but this number should go up in the coming years. Demand outstrips JAIN's input supply capabilities for both onions and bananas.

- » Since 2009, JAIN has also helped 7,000 farmers (including all farmers in contract farming) reach JAIN Good Agricultural Practices (GAP) standards, adapted to smallholder farmers from global GAP.³⁷

- **Operations**

- » JAIN identifies potential irrigation clients through 4 channels: a network of 3,000 dealers spread across India (over 50% clients); NGOs or government-funded programs (accounting for 30-40% of JAIN sales); JAIN field experts; and farmers' organizations
- » JAIN agronomists and irrigation engineers help farmers select their system, depending on soil and climatic conditions. They also recommend other products sold by JAIN, e.g., seeds or manure, and by other companies, such as other crops, fertilizer or equipment. Each expert covers ~5-600 farmers with the support of a regional manager (overseeing 25-30 experts). In the contract farming models, local village experts oversee less than 100 acres each and provide even closer support, monitoring farmers' field weekly
- » After sales, JAIN offers continuous support to farmers through training, field visits and calls. JAIN trains 60,000 farmers per year at its headquarters. JAIN also provides continuous training to all its agronomists, irrigation engineers and dealers
- » JAIN produces improved seeds at its headquarters, where it has state-of-the-art laboratories, pilot plots and greenhouses for various crops, the largest banana hardening facility in the world, and irrigation systems and pipe factories. JAIN has its onion and fruit processing facilities on another site, where it has built a 1.7MW biogas plant to recycle all of its processed fruit waste. The plant powers the refrigeration of the fruit and onion factories, and produces slurry, which JAIN transforms in organic manure, re-sold to farmers
- » For its contract farming models, JAIN selects its farmers by assessing farmers' potential, and ensuring that the total land cultivated in a given area is high enough for cost-effective tailored advice and transport, and low enough to avoid labour shortage at the harvest period.

- **Revenue model:**

- » Irrigation systems: JAIN first generates direct revenue from irrigation systems' sales, representing close to 50% of its total revenues. JAIN generates further revenues from some farmers through the sales of complementary inputs such as planting material, and solar products. Another major source of revenue is from piping systems used in agriculture and related fields.
- » Processed agro-products, sourced from smallholder farmers: JAIN provides farmers with plants that have a higher productivity than traditional seeds. For example, JAIN's onions for contract farming have higher solid contents than traditional ones, providing 15-20% higher returns in the dehydration process. This allows JAIN

³⁷ JAIN GAP is an in-house certification, inspired by the GLOBAL GAP standards, which JAIN has developed as per key accounts requirements (including Unilever, The Coca Cola Company, McDonald, Danone etc). It evaluates traceability, food safety, quality, worker's welfare, hygiene, sanitation, environment, biodiversity protection and natural resource conservation and enhancement.

to pay farmers a better price than the market while getting its own share of the additional value (in addition, contract farming allows both JAIN and farmers to avoid middlemen, and share the corresponding additional value freed up between both sides). JAIN then sells its processed food products directly for retail under the brand Farm Fresh for a small proportion, and to other food processors for most of it.

» Others: JAIN has a pipe and PVC business selling to large industrials.

Farmer demand creation and user adoption strategies:

- **Customer acquisition:** In order to convince early adopters, JAIN leverages:
 - » Demonstrations: JAIN has transformed its 2,000-acre headquarters into a large demonstration farm
 - » Free trials: A few farmers identified as high potential can be provided with free trials of irrigation systems or inputs such as seeds or plants

JAIN then relies on satisfied early adopters and positive word-of-mouth as its primary marketing strategy, achieved thanks to very high level of technical support to farmers.
- **Customer retention:** JAIN has high retention rates, thanks to:
 - » High-value trusted services: the omnipresence of training and support via qualified JAIN experts ensures that customers get the most benefit from their purchase
 - » Constant feedback from farmers gathered by JAIN dealers and experts, or at training, and high R&D budget allowing to innovate constantly to meet farmers' demand.

Regulatory and ecosystem issues: Government subsidies for irrigation systems helped JAIN sales take off, reducing the cost by 50 to 90% for poor farmers (initially, JAIN received the subsidies directly but this had to be discontinued as delays in government payments endangered JAIN cash flows). On the other hand, free provision of water and electricity for farmers makes the economic case for irrigation systems less attractive for farmers.

Is the project impactful?

Improvement of productivity and incomes:

- Compared with traditional flood irrigation practices, micro-irrigation increases yields by 50% to 200%. When associated with new crop varieties and agricultural practices (e.g. change in the density of plants per acre), increase can be fivefold for banana yield in 12 months (instead of 18), and near two fold for onion yields in 4 months (instead of 6)
- Micro-irrigation also reduces the need for fertilizer by 30 to 40%. Other JAIN agro practices and equipment limit labour needs, translating into additional savings for farmers
- The annual increase in revenue for a farmer holding 2 acres of land ranges between \$500-4,000, and savings between \$100-300. The investment in MIS (~\$1000) is thus usually recovered within one year.

Other benefits: Farmers report that they are no longer insecure about their future, and can send their children to school and college. Some report that their children had migrated to the city but decided to come back to work on the farm as they saw this was a good livelihood opportunity.

Scale and reach

- **Total number of farmers reached:** 4m farmers since inception, around 200,000 yearly
- **Rate of penetration in target communities:** JAIN reaches over 80% of farmers in some communities

- **Growth rate:** +16% revenue growth between 2013 and 2014
- **Ability to reach the poorest:** 60% of JAIN customers are BoP customers (estimates)
- **Farmer satisfaction and loyalty:** As most of JAIN sales are made through dealers, JAIN does not know exactly how many users are repeat clients. In contract farming, 15-20% new farmers join JAIN every year, both as the program grows and due to the necessary churn for crop rotation.

Acceptance and usage: NA

Is the project (economically) sustainable?

For smallholder farmers

NB: Below are typical numbers for a smallholder farmer holding 2 acres of land, which may vary $\pm 50\%$ depending on soil and weather conditions

- **Initial cost:** \$1,000 for a micro-irrigation system lasting 8 to 10 years
- **Recurring cost:** \$1,000-1,500 per year for inputs (seeds or saplings, fertilizer, manure), labour (land preparation, weeding, harvesting), and transport
- **Additional in-kind support received at farmer level if any:** Training and exposure visits, agronomic guidance of Good agricultural Practices, Packaging material (jute bags)
- **Cost of best alternative(s) and savings made thanks to project:** Savings in electricity and water cannot be monetized in India, as they are free for farmers in India. However, micro-irrigation and new practices reduce the use of fertilizer by 30-40% and save 10-20% labour costs (up to 50% for some crops), typically enabling \$100-300 savings per year
- **Affordability:** A micro-irrigation system costs 25-40% of farmer net yearly income, hence the need for credit
- **Additional income generated by solution:** The annual increase in net revenues as compared to flood irrigation and former practices is \$500-4,000 depending on crops.
- **Additional net income generated by solution:** ~\$400 million (~\$2,000*200,000 farmers)
- **Breakeven for farmer:** An irrigation system typically pays back within one year depending on harvest life cycle.

Farmers' P&L for onion contract farming

Farmers entering into contract farming are required to purchase JAIN seeds and use micro-irrigation. The investment required for 1.5 acre is in the range of \$250 for seeds, fertilizer and pesticides, plus \$250 in labour costs (for land preparation, weeding and harvesting), plus \$750 for an MIS lasting 8 to 10 years.

Farmers are guaranteed a minimum sales price, as JAIN purchases harvested onions at either at a pre-agreed sales price or at current market price, whichever is the highest at time of purchase. Farmers hence typically generate \$2,600 revenues within 4 months, or \$1,350 of net revenues even if taking into account the full cost of the micro-irrigation system.

Farmers' P&L for banana farming

Farmers willing to grow bananas need to order saplings from JAIN 6 months in advance. Saplings are sold at \$0.27 per unit (including transport), which represent approximately \$500 for 1.5 acres. They also invest \$2,000 in fertilizer and pesticides, \$750 in an irrigation system lasting 5 years, and spend another \$150 in labour for harvesting.

Improved practices would enable farmers to harvest 50 tons of bananas on 1.5 acres, and generate \$9,000 revenue after 12 months, or net revenues of \$5,600 within the year.

For the central organization:

- **Revenues:** In 2014, JAIN generated total revenues of \$940m, including \$430m from micro-irrigation, \$87m from processed foods (onions, vegetables and fruits), and \$16m from banana saplings
- **Operations profits (EBITDA):** Total EBITDA of \$140m in 2014. JAIN gross margin is in the range of 30-40% on MIS sales, covering field staff and overhead expenses, and leaving a 10% net margin on these products.
- **Breakeven date:** Total profit of \$32m in 2014. As a new business unit, SAFL has not broken even yet as they are still in expansion.
- **Repayment rates:** SAFL experienced no default but had to reschedule ~5% loans for farmers unable to repay their instalments because of various shocks (illness, climate, etc.)
- **Financing:** JAIN received long-term debt financing (3-10 years) from various banks (including State Bank of India, Central Bank of India, South Indian Bank) and financial institutions (including IFC, PROPARCO, FMO). It is now looking for low-interest debt in local currency to avoid exchange rate risk: in the past it benefitted from <5% rate debt in foreign currency, which turned out to cost >10% of interest rate in local currency, due to fluctuations in exchange rate.

Positive externalities: NA

Is the project environmentally sound?

Environmental sustainability strategy: JAIN has a direct impact through the sales of irrigation systems products and solar products. It also encourages farmers to adopt sustainable agricultural practices through its simplified certification standards JAINGAP.

Observed impact of the project on:

- **Land use and sustainable management:** 7,000 farmers certified under JAIN GAP
- **Management of water resources:** Micro-irrigation reduces the use of water by 50% to 80% as compared to flood irrigation. JAIN evaluates water saved thanks to its products since 1988 at 25 billion m³
- **Biodiversity:** JAIN has taken measures to protect, conserve and enhance biodiversity on their own premises. JAIN has developed a Biodiversity Conservation Action Program in 2010. They found 150 flora and 141 fauna species in the small watershed which they have developed since 1988. JAIN planted about 116,221 trees in 650 acres in their premises and every year 25,000 trees are being planted. JAIN also encourages farmer to get involved in social agro forestry programs in their respective villages. JAINGAP also includes biodiversity criteria
- **Emissions of greenhouse gases and other air pollutants:** Water savings can also be expressed in emission reduction, which JAIN evaluates as 3.2 Giga ton equivalent CO₂.

Is the project reinforcing the local social capital?

Involvement and empowerment of local organizations and their leadership: JAIN puts forward its early adopters as model farmers in the community.

For its contract farming onions, as JAIN faces high demand, it limits areas that each farmer can get under contract farming to ensure that all farmers who want to benefit from it get a share of the season's contracts. This has avoided creating conflicts among farmers.

Involvement and empowerment of women: JAIN has always encouraged involvement and empowerment of women in society. At the company level, JAIN encourages female associates to take higher jobs and responsibilities. At the farmer level, JAIN does not maintain data on women involvement. One data point is the 'Unnati project' (with Coca-Cola India Pvt Ltd), cultivating mango with Ultra High Density planting technique, which counts 41% women farmers (a high level as there are fewer women farmers than men farmers in India). JAIN also awards progressive women farmers for their individual achievement and contribution to the society.

Is the project scalable and replicable?

Key challenges and possible solutions to scale further

- **Leveraging ICT for CRM:** As most sales are done via dealers, JAIN has little oversight of its final clients. JAIN field reporting is still partly paper-based and could gain efficiency by leveraging ICT, which would also allow monitoring dealers' activity more closely. The company has started designing adapted IT systems.
- **Continuing innovations for 'dry-land farmers':** The proportion of farmers without water access –60% across the country and up to 85% in Maharashtra –hinders the potential market of JAIN. JAIN is already working on solutions both at community level, e.g., water conservation structures on river and in the village catchment, and at individual level, e.g. farm ponds for storing water on field, to make water available to more farmers.
- **Extending partnerships with organizations bringing complementary skills:** JAIN has already developed a few partnerships, including a flagship program with Coca Cola for mango production "Project Unnati", and Public Private Partnership project for Integrated Agricultural Development with state governments. However, there is still a high potential for developing more partnerships in other areas, e.g., with utilities that could bring water to 'dry-land farmers', or with other food companies interested in the traceability that JAIN can bring.

External pre-requisites for the project to replicate in a new country

- **(Low) availability of water:** Micro-irrigation can only be installed where farmers have access to water. A country where water cost is high would translate into a better economic value proposition for farmers.
- **Government support:** 30-50% of JAIN revenue are related to government-funded programs: the government funds directly some of JAIN programs (e.g., providing connected 24/7 automated irrigation to 7,000 farmers in Karnataka), and subsidizes 50% of irrigation systems' costs for farmers up to 5 acres.

Sources

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