Growing Food, Products and Businesses:

Applying Business Incubation To Agribusiness SMEs

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Applying Business Incubation to Agribusiness SMEs

Review of 10 Agribusiness Incubator Case Studies in Brazil, Chile, India, Indonesia, Malaysia, Mexico, Mozambique, South Africa, and Uganda.

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About *info*Dev

This report is commissioned by *info*Dev, a global partnership program within the Financial and Private Sector Development Vice Presidency of the World Bank Group. Its mission is to enable innovative entrepreneurship for sustainable, inclusive growth and employment.

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PREFACE

The Review of Agribusiness Incubator Case Studies[1] presented in this report draws upon the field missions conducted by the Consultant's Team during November 2010 to April 2011. Ten agribusiness incubators or institutions involved in agribusiness incubation have been visited in three continents, including 3 organizations in Africa, 4 in Asia, and 3 in Latin America.

The Consultants would like to express their thanks to the incubators' management, staff and clients. The respondents have been generous with their time and cooperative in sharing information.

The opinions expressed in the report however are those of the consultants and do not necessarily represent either the opinion of the incubators' management or clients, *info*Dev, and the World Bank.

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10 October 2011

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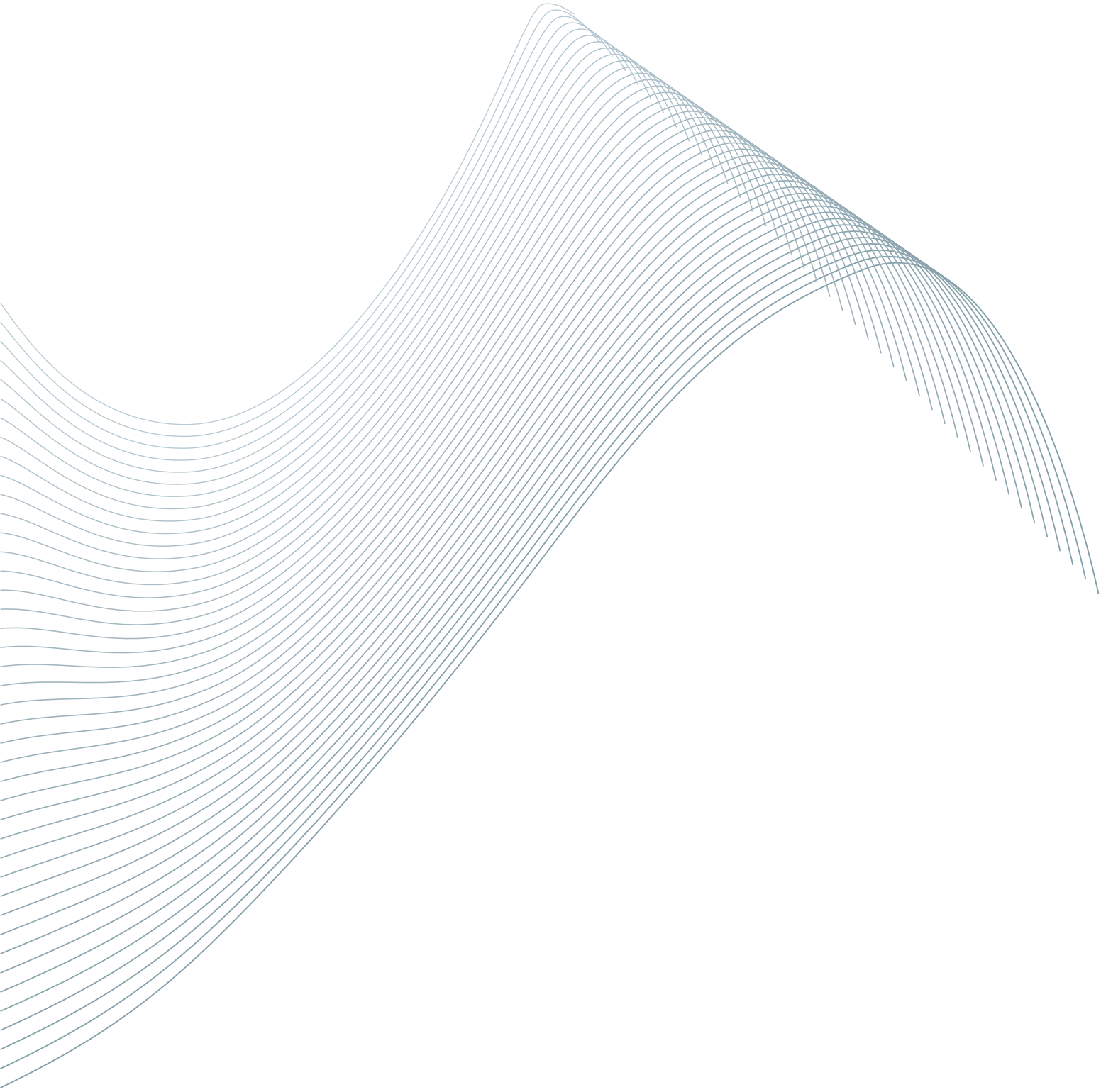
Abbreviations

Acronym	Explanation
AABI	Asian Association of Business Incubation
ABI	Agribusiness Incubator
AIBI	Association of Indonesian Business Incubators
APIN	Asia Pacific Incubation Network
BMG	Bogor Municipal Government
BULOG	National Logistic Agency
CME	Coordinating Ministry of Economics
ERDC	Entrepreneurship Research and Development Center
FAO	United Nations Food and Agriculture Organization
IAA	Incubator for Agribusiness and Agroindustry
IAA-IPB	Incubator for Agribusiness and Agroindustry, Bogor Agricultural University
ICMSME	Innovation Center for Micro and SMEs
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IFAD	International Fund For Agricultural Development
IFC	International Finance Corporation
IP	Intellectual Property
IPB	Bogor Agricultural University
IT	Information Technology
LPM	Institute for Community Services
LPPM	Institute for R&D
MCSME	Ministry of Cooperative and Small Medium Enterprises Development
MLSCF	Malaysian Life Sciences Capital Fund
MNE	Ministry of National Education
MOA	Ministry of Agriculture
MOH	Ministry of Health
MOI	Ministry of Industry and Trade
MOL	Ministry of Labor
MTA	Material transfer agreements
PPP	Public-private partnership
SME	Small Medium Enterprise
TnsMz	Technoserve Mozambique
UDET	Uganda Development Trust
UIRI	Uganda Industrial Research Institute
UNDP	United Nations Development Programme
UNIDO	United Nations Industrial Development Organization



Executive Summary

According to the World Bank, "the potential of agricultural growth to reduce poverty is four times greater than the potential of growth from other sectors." The 2008 World Development Report outlined how investments in agribusiness produce significant multiplier effects through their forward and backward linkages, generating demand for agricultural products and associated inputs and services and creating on- and off-farm employment. Interventions that can help transform comparative advantages in commodity markets into competitive advantages in differentiated product markets can therefore have a tremendous development impact.

The creation of a competitive indigenous agribusiness sector requires an effective innovation and entrepreneurship ecosystem that enables the start-up and growth of innovative enterprises. Good infrastructure, effective policies and regulations and access to appropriate financing are critical enablers. In addition, access to and adoption of innovation along with entrepreneurial skills will be critical to advancing the sector.

Business incubation can be one approach to enabling the start-up and growth of innovative enterprises. Beyond business incubators' immediate impact on enterprise and job creation, *info*Dev has found that they can be important change agents in the innovation and entrepreneurship ecosystem. Business incubators have strategic linkages with the broader innovation and entrepreneurship ecosystem actors comprising academia, industry, government, financiers and entrepreneurs; they offer financiers a pool of enterprises that are being handheld and thus represent lower risk; they offer corporations innovation and supply chain development; and they offer academia an outlet for research commercialization and employment of graduates. Across *info*Dev's network of more than 400 business incubators across 100 countries, there are also numerous examples of business incubators stimulating the start-up of new financing products for SMEs and providing inputs to new SME policies or regulation.

This being said, the agricultural sector has some distinct features, which pose particular challenges for business incubators. All innovative early stage enterprises—regardless of sector—face technological and market related risks. However, agribusinesses also face risks particular to this sector such as biological and weather related risks, and commodity price volatility. Agribusinesses also operate within the context of rural areas, which are characterized by more limited availability of infrastructure and skills. To be effective, business incubation applied to agribusiness must therefore adapt to these particular circumstances.

There is not much evidence-based literature on agribusiness incubation. *info*Dev therefore commissioned this study to better understand the role of business incubation in the context of enabling the start-up and growth of innovative agribusiness SMEs specifically, and to identify what lessons and good practices can be derived from the experience of mature agribusiness incubators.

The audience for this report includes stakeholders wishing to learn what interventions can be used to effectively promote the start-up and growth of innovative agribusiness SMEs in developing countries. This audience includes international donor agencies and governments looking to enhance the income generating potential of the agricultural sector, as well as agribusiness incubators seeking to improve the efficiency and effectiveness of their own operations. *info*Dev has also commissioned a training program designed to provide specific guidance on how to best plan and operate an agribusiness incubator. More information about the training program can be found at www.idisc.net.

This report is based on a literature review, complemented by the findings and conclusions from 10

case studies of agribusiness incubators in nine low- and middle-income countries. The case studies were conducted via site visits and interviews between November 2010 and April 2011. These include the following:

- Fundación Chile (Chile)
- Technology Based Business Incubator, Federal University of Viçosa, CENTEV (Brazil)
- Fundación Jalisco (Mexico)
- Incubator for Agribusiness and Agroindustry Bogor Agriculture University, IAA-IPB (Indonesia)
- Agribusiness Incubator-ABI, ICRISAT (India)
- Villgro (India)
- Malaysian Life Sciences Capital Fund, MLSCF (Malaysia)
- Timbali Industrial Incubator (South Africa)
- Technoserve of Mozambique (Mozambique)
- Uganda Industrial Research Institute, UIRI (Uganda)

These cases were selected based on years in operation (ranging between 5 and 36 years) and track record in graduating competitive agribusiness SMEs. The authors also sought to strike a geographic balance and to represent various types of agribusiness incubation models.

In this report, agribusiness incubation is presented as one approach that can contribute to commercialization and modernization of agriculture, as well as the promotion of a competitive indigenous agribusiness industry. Other approaches which aim to achieve these objectives include (i) strengthening farmer organizations, (ii) investing in large scale agribusiness, and (iii) value chain development. Within this spectrum of complementary options, agribusiness incubation specifically aims to facilitate new, indigenous, firm entry by nurturing early-stage innovative enterprises that have high growth potential.

The role of agribusiness incubators is to demonstrate that new business models can operate profitably, and to have a catalytic effect in the sector. Incubation is thus a very targeted approach, selective in nature, offering growth oriented entrepreneurs a combination of tailored services that often include 1) shared facilities and equipment for production and testing; 2) business development, market access, quality assurance and technology transfer and assessment services; 3) financial services; 4) mentoring and networking; and 5) assistance with navigating and complying with regulatory requirements. As illustrated in this study, incubators often play a significant role in lending credibility to start-up enterprises and affecting the enabling environment for agribusiness entrepreneurs.

> *"Affiliation with the CENTEV/UFV Technology Incubator and the UFV "brand" supported the prestige of the company and provided a high level entry point in contacting other companies and institutions."* NUTRYCLIN FOODS, incubated by CENTEV/UFV Technology Incubator in Brazil.

> *"Timbali gave me the skills necessary, and the drive, stamina and ability to start my own company."* Caroline Matalane, incubated by Timbali Technology Incubator in South Africa.

Many models exist for agribusiness incubation. Selection of a model depends on the core objectives of the stakeholders, combined with the unique characteristics of the local business environment, and the amount and nature of the funding available to initiate the incubation activity. A commonality amongst the case studies assessed in this report, was that most were structured as public-private partnerships. Beyond that, there were significant differences. The report identifies 3 types of agribusiness incubators including (i) agribusiness sector/value chain incubators; (ii) agricultural research commercialization incubators; and (iii) technology transfer incubators. Within each type, there are significant differences in terms of forms of public-private partnerships, affiliations, target clients, business models, and organizational design.

Incubators evolve over time. Agribusiness incubators pass through similar early stages of development, but subsequently pursue alternative pathways of development over time. The three stages of "early stage development" are: (i) Install the Basic Business Infrastructure; (ii) Prove Ability to Add Value and to Graduate Incubatees; and (iii) Insert Incubatees into the Business Ecosystem. The study identified five alternative pathways for more advanced development and scale-up of agribusiness incubation including: (i) Technology Commercialization-the

incubation of diverse agribusiness SMEs; (ii) Focus on Specific Value Chain and/or Serial Expansion of Multiple Value Chains; (iii) Enhance Whole Sector Competitiveness; (iv) Replicate Incubators and/or Densify the Incubation Ecosystem; and (v) Make Way & Collaborate in the Incubation Ecosystem.

While the incubators assessed operate at vastly different scales (i.e. starting capital ranges from USD 10,000 to 50 million, the impact and cost benefit analysis conducted in conjunction with each of the case studies indicates that the majority have been successful in creating sustainable and competitive enterprises and benefits that outweigh the cost, while diffusing a number of technologies, as well as product and process innovations. For example, Fundación Chile has spearheaded the development of the salmon industry that in a span of just slightly more than 10 years has been able to grow by a factor of 1000 and contributed to US$2.2 billion exports and more than 35,000 jobs. The efforts of Technoserve in Mozambique and Fundación Jalisco in Mexico have led to the upgrading of entire sub-sectors such as poultry, cashew nuts and blueberries. CENTEV-UFV has developed a new model for commercialization of agricultural research in Brazil, and has cultivated successes such as a biotechnology business specializing in a fungus that protects plans from parasitic nematodes, a product which could help reduce the yearly US$100 billion losses in world agriculture. Timbali Industrial Incubator in South Africa has transformed the life of poor women into assertive entrepreneurs in the highly competitive flower business. ABI-ICRISAT has supported the growth of successful biotech companies; and IAA-IPB has promoted the growth of zero-stage enterprises owned by women into successful, competitive, and growing medium enterprises.

> *"After Fundación Chile came and showed me what to do, I have been making more in 7 months than I used to do in two years."* Farmer in Chile.

Based on the literature review and the case studies conducted, it appears that the success of agribusiness incubators in creating sustainable and competitive enterprises relies upon 6 factors, including the ability of the business incubator to effectively: (1) help the entrepreneur manage the risks associated with an agribusiness enterprise through a combination of technology, institutional, and networking strategies; (2) understand the value chain affecting the success of the enterprise and assisting the enterprise with positioning itself in the value chain by linking farmers and enterprises to meet the demand of consumers for stable, quality, and affordable products; (3) identifying and demonstrating innovative business propositions so as to catalyze broader sectoral take-up; (4) adapting the focus and business model of the incubator, and strategically scaling it up in response to market opportunities and market failures; (5) pro-active business orientation actively identifying market opportunities; and (6) incubation design basics, including: leadership with a business mindset and excellent agricultural market knowledge (preferably with agribusiness experience), a lean staff complemented by strong partnerships, an institutional framework that provides sufficient flexibility allowing for learning by doing, strong capital structure, and dense networks—including effective linkages with sector leaders.

Ultimately, scale and replicability of the incubator are the real test of the efficacy of the incubating approach to agribusiness development. By design each incubator can reach only a limited number of enterprises. In order to have larger impacts, the approach either has to move to a sector approach or be replicated to reach out a larger number of enterprises.

Key recommendations of the report include:

- **Broader In-Depth Assessment of Agribusiness Incubators.** To pursue a more in-depth and broader assessment of agribusiness incubators based on a larger sampling of cases in order to validate the conclusions of this report, and to better understand the impact of agribusiness incubation on catalyzing a new sector, increasing the competitiveness of an existing sector, or stimulating local or regional economic development. Agribusiness incubators are relatively recent in developing countries. This study assessed the existing literature, as well as ten hand-picked cases. Further analysis—including of agribusiness incubator that failed—is recommended. Such as study would require significant field research, including extensive interviews with entrepreneurs, farmers and other stakeholders.

- **Training and Capacity Building.** To further disseminate the knowledge on agribusiness incubators and provide training for new agribusiness incubator managers, *info*Dev has taken leadership in initiating training for agribusiness incubators based on the assessment of good practices. The demand for this type of training is quite high, since so far no other training has systematically benefited from the experience of agribusiness incubators in developing countries. Through further investment in research, as well as engagement of developing country incubators in a peer-to-peer learning format, the body of knowledge on this subject can be enhanced and enable more effective and innovative solutions to increasing incomes based on a comparative advantage in agriculture.
- **Agribusiness Incubator Programs.** Promote agribusiness incubator programs, as opposed to agribusiness incubator projects. An agribusiness incubation program considers investment in agribusiness incubators as part of an overall effort towards agricultural commercialization and growth of sustainable and innovative agribusiness SMEs. Rather than seeing an agribusiness incubator project investment in isolation, it aims at establishing a network of agribusiness incubators integrated with other initiatives already occurring in the same countries, such as value chain development, farmer organization development, improved business environment, promotion of SMEs, and promotion of innovations and technology.

Introduction

This report represents an important step in the ongoing efforts of *info*Dev to make effective and useful knowledge available to policymakers, investors and private sector development stakeholders to use in their efforts to encourage private sector investment and private sector led economic growth. The effects and effective leverage on poverty alleviation are particularly great in the domain of agribusiness development where *info*Dev is focusing this particular project. Strong and dynamic agribusiness sectors allow farmers to strengthen their linkages to markets, to improve their productivity and to diversify their production from low value products. If more value addition can happen locally, developing countries can also reap significantly more benefits from their comparative advantage in agriculture.

Agribusiness incubation can be utilized to accelerate the commercialization and modernization of agriculture and to develop a competitive agribusiness sector in developing countries. It complements other approaches such as development of farmer organizations, investment in large-scale agribusiness, and value chain development. The approach offers the potential to develop SMEs which add value to primary agricultural production and to link farmers to markets in ways which other development tools do not offer.

The objective of this report is to present a summary of results and lessons from experiences with using business incubation to stimulate the start-up and acceleration of innovative agribusiness SMEs.

1.1 Definitions: Business Incubation, Agribusiness, Agribusiness Incubators

For the purpose of this report, agribusiness incubation is defined as a process which focuses on nurturing innovative early-stage agro-based enterprises that have high growth potential to become competitive businesses. The business incubation process is highly selective, pro-active and holistic. It provides a combination of:

- Shared facilities and equipment;
- Business development, market access, and technology assessment services;
- Financial services; and
- Mentoring and networking.

The heart of a business incubator is the business support service and the mutual support from fellow incubatees that it provides to companies it supports. The typically limited incubation period is most often laid out in performance agreements which codify relationships between incubator and incubatee at the beginning of an incubatee's tenure. The enforced discipline of these agreements acts as an introduction to commercial reality for many clients. In lieu of even tougher market competition, incubators cultivate a no-excuses performance culture among their clients through the hard budget constraints and tough incentives which they enforce on them.

The term "agribusiness" as it is used in this report refers to a diversity of commercial activities conducted both on farms, as well as off farms and importantly, between farms and their off-farm partners. These activities include crop cultivation and animal rearing, input supplying, agro-processing, food manufacturing, merchandising, exporting and retailing, as well as the operations of specialized service providers who support core agro-processors with transportation, finance, information and other critical farm support services.

1.2 Approach to the Assessment

Agribusiness incubators are a relatively recent innovation in developing countries, and thus not much evidence-based literature on them exists. The earliest and perhaps most successful example is Fundación Chile, started in 1975. Most agribusiness incubators in developing countries have developed over the past 15 years.

The assessment of good practices of agribusiness incubators presented in this report is based on 10 case studies of incubators distributed across Africa, Asia, and Latin America[2]. The methodology of the assessment (see APPENDIX 3) is based on a set of interview guidelines that have been developed by the project team and conducted over the period of November 2010 to April 2011 (see APPENDIX 1). Each case study includes a set of success stories. An overview of the characteristics of each case study is provided in APPENDIX 4. A separate report contains the details of the case studies and success stories[3]. The 10 agribusiness incubators (see Figure 1) include:

- Fundación Chile (Chile)
- Technology Based Business Incubator, Federal University of Viçosa, CENTEV (Brazil)
- Fundación Jalisco (Mexico)
- Incubator for Agribusiness and Agroindustry Bogor Agriculture University, IAA-IPB (Indonesia)
- Agribusiness Incubator at International Crops Research Institute for Semi-Arid Tropics, ABI-ICRISAT (India)
- Villgro (India)
- Malaysian Life Sciences Capital Fund, MLSCF (Malaysia)
- Timbali Industrial Incubator (South Africa)
- Technoserve of Mozambique (Mozambique)
- Uganda Industrial Research Institute, UIRI (Uganda)

The case selection was based on consultation with *info*Dev and on the maturity of the incubators, demonstration of results, and location in a developing country. The case studies collectively assure wide coverage of different types of agribusiness incubators. The case studies span beyond the "traditional incubator" view as technology-oriented and a spin-off from a university or research center. There are 3 research center-based incubators covered in this assessment and they are fairly representative of this type of incubators. For other types of incubators presented in this assessment, we are discovering a new territory, and it is difficult to know to what extent the case studies are representative of each type. APPENDIX 2 provides a brief summary of the justification for inclusion of each case study. APPENDIX 4 presents the general features of the 10 agribusiness incubators. APPENDIX 5 presents a discussion of internationalization issues related to agribusiness incubators.

1.3 Organization of the Report

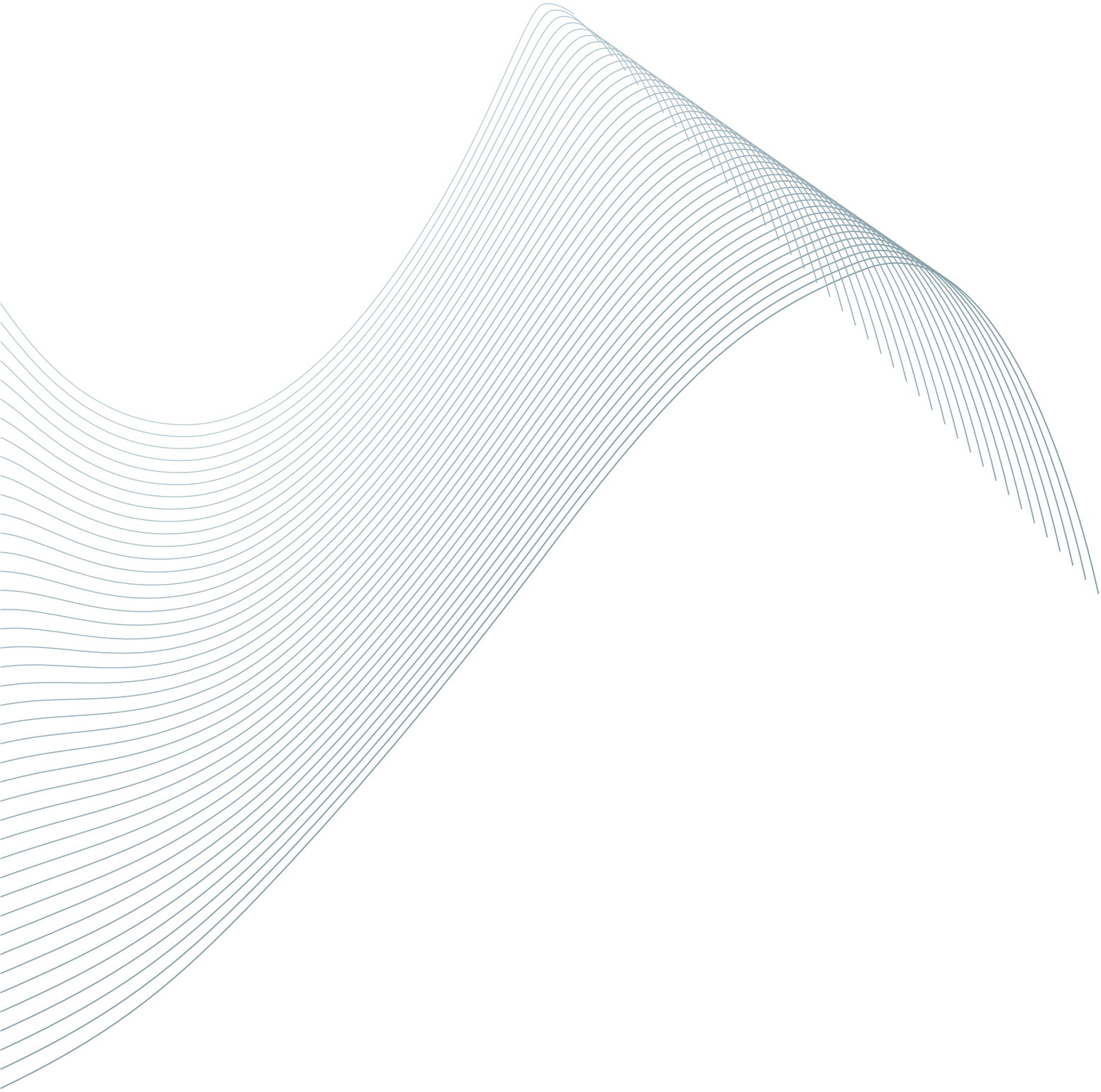
The report is organized into 9 chapters. Chapter 1 provides the introduction to the report. Chapter 2 presents alternative approaches to agribusiness development and Chapter 3 discusses the role of agribusiness incubators. Chapter 4 discusses the challenges of agribusiness incubators and chapter 5 presents a typology of agribusiness incubators. Chapter 6 elaborates on the evolution of incubators over time. Chapter 7 presents the analysis of impact and cost-benefits. Chapter 8 summarizes good practices and lessons learned. Chapter 9 presents the recommendations.

2 The project team conducted 12 case studies, including the 10 discussed in this report and two additional case studies in Uganda of two organizations that practice some elements of agribusiness incubation. These two case studies (UDET and Technoserve Uganda) in retrospect did not prove to be suitable examples of agribusiness incubators and therefore are not included in the discussion of the main report.

3 ACI-ETG (2011) Agribusiness Incubators: Case Studies and Success Stories, a report prepared for *info*Dev by Agrifood Consulting International (ACI) and Economic Transformation Group (ETG), Bethesda, US.

Figure 1 Location of 10 Agribusiness Incubators

Source: Authors.



Chapter 2

Alternative Approaches To Agribusiness Development

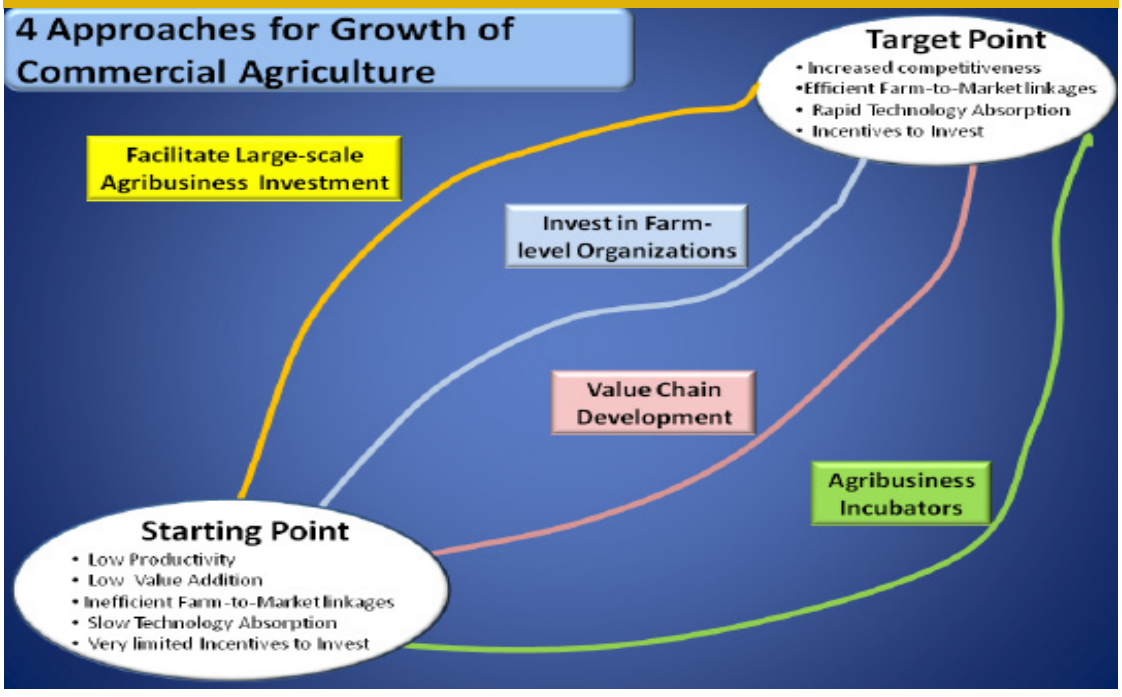
The assessment in this report will show that there are many types of agribusiness incubators differing in terms of several dimensions. What all these types have in common is an approach—incubation of start-up enterprises—that provides an alternative path for agricultural commercialization and agribusiness development.

The objective of this chapter is to locate agribusiness incubators within the context of alternative approaches to agricultural commercialization and agribusiness development. Three alternatives will be presented and compared to the agribusiness incubator approach.

2.1 Alternative Approaches

The agribusiness incubation process focuses on nurturing innovative early-stage agro-based enterprises that have high growth potential to become competitive businesses. Agribusiness incubators often enable the start-up and growth of innovative value adding agribusinesses. Alternative approaches to transforming comparative advantages in commodity markets into competitive advantages in differentiated product markets have been tested over the past two decades by several development organizations such as the World Bank, the Food and Agriculture Organization (FAO), and the International Finance Corporation (IFC). In general development strategies for agribusiness involve one version or other of four general approaches, as the figure below represents.

Figure 2 Alternative Paths for Driving Agricultural Market Development



Source: Authors.

2.1.1 Strengthening Farmer Organizations

In this approach, investments have been designed in order to enable farms to operate as for-profit businesses, even at small scales of commercial operation. Some of the investment programs tested involved direct[4] investment in farm-based business models and others involved indirect investment in supportive services, enabling rural infrastructure and policy reform. Examples include the strengthening of agricultural extension services, the reform and modernization of public sector agricultural research centers and the transformation of both into more farmer demand-responsive institutions. Other programs with similar designs and comparable objectives involved the strengthening and reengineering of farm level organizations. Programs designed to strengthen farm to market linkages and to acquire quality farm inputs have been particularly popular among donors. Examples include the Cereal Banks of Kenya which the Rockefeller Foundation has supported, the Commodity Trading Company and network of subordinate commercial farming organizations in Mozambique which the International Fund for Agricultural Development (IFAD) has helped to launch and which continue to be supported by Fair Trade International, and the expanded networks of farm input stockists in Zambia and elsewhere in East and Southern Africa which the Gates Foundation is supporting. The approach to strengthening linkages between farms and markets which these donors and others are pursuing operates at the base of the rural pyramid. Typically the social benefits which they afford extend beyond commercial farm viability and increased farm wages to include various aspects of social life in rural areas, through investment in education and health.

2.1.2 Large Scale Agribusiness Investment

A quite opposite approach is through the investment of large agribusiness companies and to rely on trickle down effects to benefit other participants in the value chain. This approach involves the following: Enhancing private investment in agribusiness by improving the investment environment for agriculture and by investing in missing or weak infrastructure. The premise underlying this approach is that large companies possessing the essential competencies, strategic market access, technological "know-how" and complementary business interests can create significant incremental value for their shareholders by applying these core competencies in the markets of developing countries. In this way they are able to transform latent comparative advantage in agricultural production into sustainable competitive advantage. This approach would have donors committing resources to reforming and removing government policy failures and market coordination failures. It would also make infrastructure development an agribusiness development priority. Importantly, it would leave much of the implementation and execution of detailed tactics for sector development to large agribusinesses. The collateral dynamism which these businesses are able to create would be disseminated to other private companies through example, affiliation, and spinoff.

2.1.3 Value Chain Development

Value chain development has gained enormous momentum over the last decade. In this approach the key idea is to increase competitiveness and bridge the gap between farmers and markets through the development of contracts and partnerships with agribusiness enterprises; this in turn will ensure that farm production is responsive to market demand and value addition is increased and shared among the stakeholders in the chain. Typically instruments to implement this approach are matching grants to SMEs and farmer groups, policy dialogue, strategy development for enterprises and subsectors, and public private partnerships to promote investment in the agribusiness sector.

2.1.4 Agribusiness Incubation

Agribusiness incubation entails directly working with early stage enterprises and facilitation of their growth through a number of services (shared facilities and equipment, business development, technology, finance, mentoring and networking). The approach tends to be less investment intensive than the approaches mentioned above while emphasizing building capacity, facilitating access to market, decreasing risk and increasing the competitiveness of the enterprise.

4 IFAD have pioneered in designing various programs for stringing farm level governance, re-skilling and teaching farmers, and building out supply chains with a base in farm level organizations. The World Bank has also been active in testing and strengthening various forms of farm level organization.

2.2 Comparison of the Alternative Approaches

The alternative approaches all contribute to commercialization and modernization of agriculture, development of an agribusiness sector and an increase in farming incomes. However, they operate in different ways, apply different incentives, leverage different participants, and require different levels and types of investments.

While initiatives designed to encourage large scale agribusiness investment typically begin at the demand end of global value chains, and farm group strengthening typically begins at the supply end, **Incubator development begins somewhere in the middle of the value chain**. Moreover, differently from the value chain approach that is not necessarily focused on any specific value chain actor, agribusiness incubators are more focused on nurturing and promoting growth of sustainable and innovative start-up enterprises.

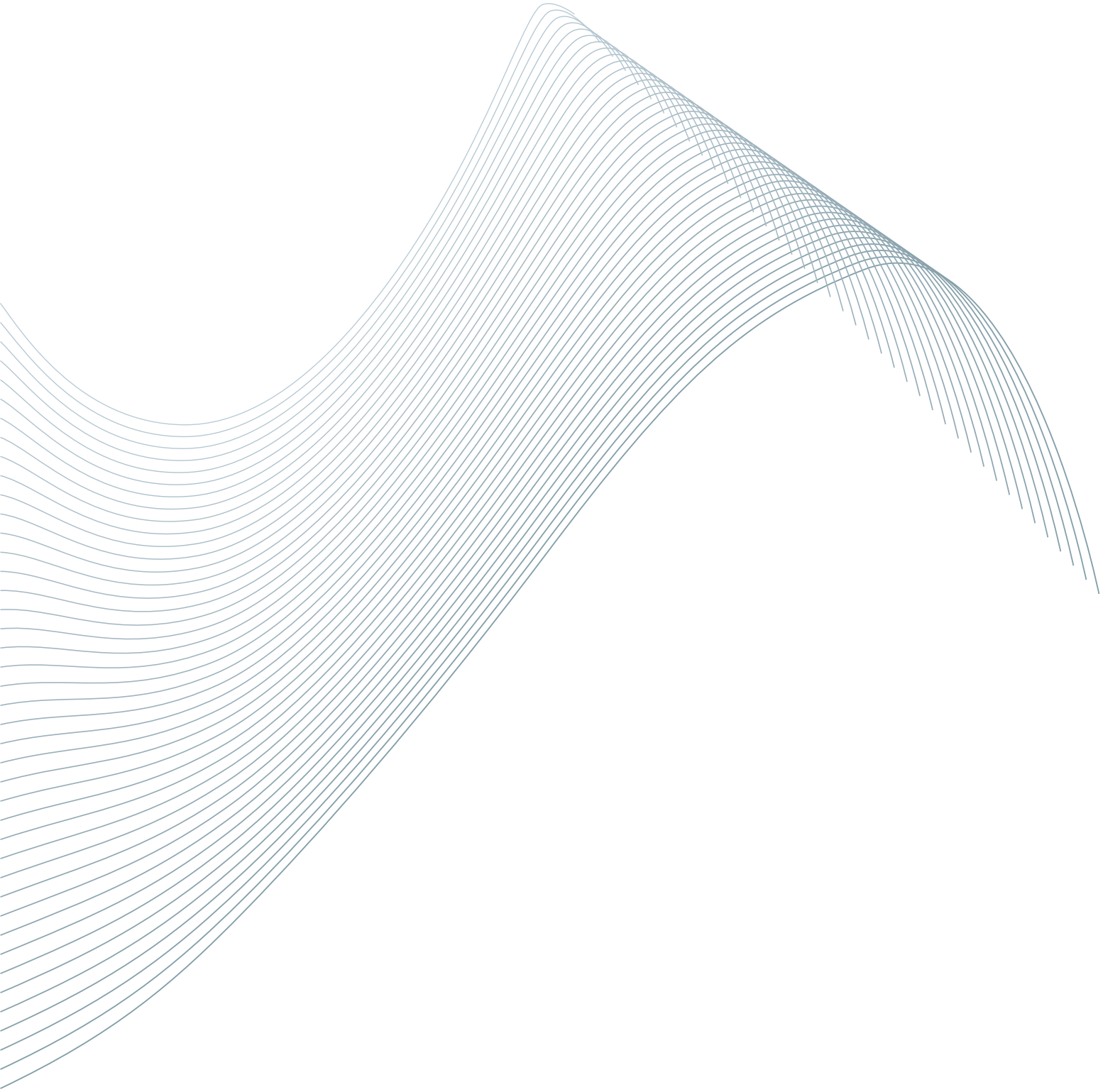
Table 1 Features of Alternative Approaches to Commercialization of Agriculture

Approach	Core Objective	Types of Interventions	Main Beneficiaries	Major Outcome
Strengthening Farmer Organizations	■ Increase farming productivity and farmers' incomes	■ Support to farmer organizations ■ Develop rural infrastructure ■ Improve input supply ■ Investment in education and health ■ Credit, usually as microcredit	Farmer organizations	Significant impact on the productivity and incomes of smallholder farmers
Large Scale Agribusiness	■ Stimulate international investment and export earnings	■ Improve investment environment, including removing entry and trade constraints ■ Level competition with parastatals	Large scale agribusiness enterprises (often multinational companies)	Significant impact on supermarket expansion and industries such as poultry, seed
Value Chain Development	■ Improve linkages among actors in the value chains	■ Improve investment environment ■ Matching grants ■ Public private partnerships	Farmer groups and enterprises	Significant impact on value added of specific value chains
Agribusiness Incubators	■ Stimulate innovation and new firm entry	■ Shared facilities and equipment ■ BDS, market access, technology services ■ Financial services ■ Mentoring and networking	Agribusiness SME	Significant impact on growth of sustainable agribusiness SMEs

In terms of investment levels, all four approaches outlined require investment in minimum serviceable levels of infrastructure[5]. Beyond that, each approach requires different types and levels of investment. For example, trying to transform small scale farmers who are primarily concerned with food adequacy for their own households and who consequently may be reluctant to take additional risks over and above those associated with traditional subsistence farming requires investment in leadership, discovery of new opportunities, transformation of values and the development of new skill sets at the farm level.

Incubator development entails a great deal of institution building and institutional learning about what works best and what does not with respect to incubator operations. It also requires investment in networks where founder/leaders of new incubators can find answers to specific pressing questions, and where they can identify sources of appropriate technology and, most importantly, where they can find financial resources needed to fuel their own development.

5 For more discussion on the role of supportive infrastructure see APPENDIX 6.



Chapter 3

The Role of Agribusiness Incubators

The role of agribusiness incubators is to stimulate innovation and new firm entry. They do this first to demonstrate that new business models can operate profitably and that traditional, primary sector production, when complemented by organized value chains, can create sustainable wealth and new employment in rural space. Their additional role is to communicate this information to persons who may be interested in forming new businesses. Through their activities, their communications and their network formation, agribusiness incubators need to create credible information about value addition. Once created, this information can have tremendous economic value to potential investors who are sufficiently challenged and motivated to undertake additional private investment.

3.1 Promoting Innovative "Agropreneurs"

A number of agribusiness entrepreneurs with a clear view of value-adding opportunities are emerging in developing countries. These entrepreneurs are linked to agriculture by birth right; they are pragmatic and practical but also aware of the need for a new agriculture based on effective competition in value added markets, including healthy food markets, convenience, modern packaging, functional food, and nutraceuticals (see Box 1). These "agropreneurs" understand that the growing global consensus that agriculture needs to be sustainable and eco-friendly opens up many new opportunities to create competitive advantage from innovative value chain design, innovative technology, new forms of partnership along value chains, new ways to measure and manage carbon footprints, etc. Agribusiness incubators identify and mobilize this small cohort of emerging entrepreneurs.

BOX 1. Pulus Wangi, Pak Ede Kadarusman, Vetiver Essential Oil

Mr. Ede is a farmer, currently heading a vetiver farmer cooperative in Garut, a hilly area of West Java, Indonesia, famous for the cultivation of vetiver and vegetables. Mr. Ede is also the Chairman of the Vetiver Farmer Association including 5,000 farmers and cultivating 1,700 ha of vetiver. Together with his son who is a 29-year old graduate in Business Management he has developed a company that is making 550 thousand USD per year. The main traditional use of vetiver in Garut is for essential oils. However, other uses include aromatherapy, and Mr. Ede's son has started to consider a number of applications such as handicrafts (like bags, frames, vases, pots), fertilizer, medicinal, and even vetiver-coffee!

Since 2009, when Mr. Ede and his son joined the Incubator for Agribusiness and Agroindustry associated to the Bogor Agricultural University in Indonesia (IAA-IPB), production has increased from 2,000 kg/year to 3,000 kg/year of essential oil. This was possible partly through facilitated access to credit, partly through better linkages with buyers, and partly through efficiencies gained in the use of new distillation equipment. Both Mr. Ede and his son attended training facilitated by the agribusiness incubator both in Indonesia and abroad. The company has been awarded a number of prizes in Indonesia and abroad for its innovative uses of vetiver.

BOX 1. Pulus Wangi, Pak Ede Kadarusman, Vetiver Essential Oil

Mr. Ede and his son plan to expand production to 5,000 kg/year by 2014. This will be achieved through expansion of cultivated area and investment in new distilleries. The market for vetiver is large and growing and there is a huge gap to fill, not only for perfume, but also for aromatherapy. Mr. Ede's son is thinking to engage in new services such as eco-tourism and edu-tourism. Eco-tourism is targeted to people who want to observe the beautiful scenery of vetiver fields in cool mountainous areas, while having interactive discussion with the vetiver farmers and distillers. His company can also provide lodging for overnight staying.

In order to expand, the company will have to make considerable investment in accumulating stock of essential oil to ensure timely and regular delivery to the client and overcome fluctuations due to various climate conditions. Moreover, new technologies both in production and processing will allow to obtain higher yield per ha and higher yield of oil per kg of vetiver.

While the key customers are currently the perfumery industry and the hotel and tourism industry (for spa, aromatherapy and ecotourism services), a potential customer could be the pharmaceutical industry (for some therapeutic property of vetiver) and the cosmetic industry. The company is in the process of certifying its production as organic and engaging in a "zero-waste program" to support green and environmentally friendly production.

3.2 Enhancing Sector Competitiveness

Agribusiness incubators operate in business environments which are dynamic and in which the competitiveness of an entire sector is determined, in large part, by the sector's ability to learn more rapidly than its competition. The process of competitive enhancement entails continuous learning: learning about new technologies, new market trends and new challenges, which competitors are initiating. Incubators can play a significant role in this process of continuous sector level learning.

Agribusiness incubators can assist, for example, with the development of competitively robust agribusiness spaces in which knowing more and more about an increasingly narrower sector/market domain becomes a generally accepted strategy among industry leaders. They can provide information through market research, new product testing, and commercial demonstration projects. Incubators can help early-stage small agribusinesses identify best available technologies and absorb them more quickly. They can assist with developing value chain structures, which serve increasingly refined market segments.

BOX 2. Fundación Jalisco: Launching New Agribusiness Value Chains In Mexico

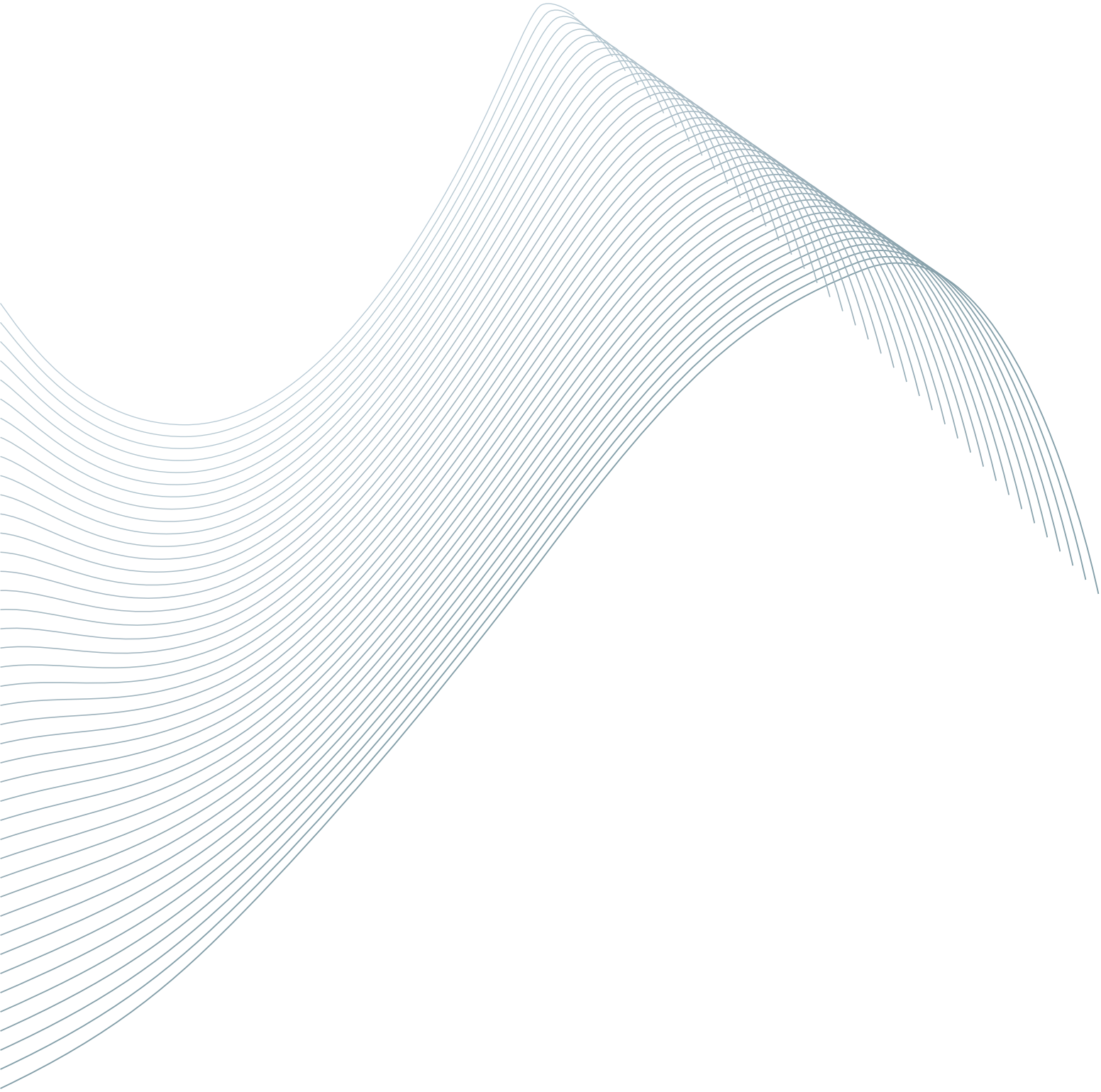
After visiting Fundación Chile in 2005, the business leadership of Fundación Jalisco in Mexico decided early on that it would take too much investment and time to replicate a large institutional model like Fundación Chile. Instead they decided to develop a smaller model—to become an applier of technology rather than a generator of innovation. Essentially, Fundación Jalisco became a promoter of value chains, actors, investors, field extension agents, and farmers in a new business area. As such, Fundación Jalisco is a relatively "lean and mean" agribusiness innovation and incubation institution, now with a professional staff of twelve. In the past five years, they have launched three new agribusiness value chains in the state of Jalisco: blueberries, olives, and goat cheese. The most successful has been blueberries, in which Fundación Jalisco served to articulate the farm to market chain and made key investments in pioneering companies. Fundación Jalisco co-invested in developing a blueberry nursery, attracted a world-class berry commercializer, VitalBerry, and collaborated with the state government to create a "berry program" that subsidizes farms with blueberry planting material and provides technical assistance and training to the farmers.

At the same time, individual agribusinesses need to develop sufficient confidence to rely on other members of their agri-industrial cluster to invest in competencies which complement their own. The result is the development of new industrial structures which promote both cooperation and competition. The strategy underlying cluster development is simply the strategy of investing more narrowly in competencies, which encourage companies of the first rank within their respective domains to link up with other companies, which have invested in becoming the best in their respective service classes. Incubators can assist these developments by providing information and strategic direction and by brokering end-to-end linkage. Among the case study incubators both TnzMz and Fundación Chile are active and effective in all of these areas.

The internal dynamics, which emerge from this kind of approach, are both competitive and collaborative. A few years ago two game theory professors at MIT coined the term, 'Coopetition[6]' to describe the process of shifting the basis of competition away from price and onto other bases (e.g. quality, time to market, value addition, etc.). Under such circumstances first movers can enjoy advantages and are able to further segment entire markets into increasingly narrower and more profitable niches. Within each of these niches non-price competition prevails until the second and third movers enter the market.

Technoserve has succeeded in developing a poultry cluster in Mozambique, which is becoming interestingly competitive within the region. This cluster is organized into three regional zones which compete with one another for access to the Maputo market, but which have formed a Mozambican Poultry Association to facilitate their collaborative development by setting food safety standards and by working with government to reduce the risk of infectious disease. In a parallel effort, Technoserve facilitated the development of a cashew cluster several years ago, which continues to develop on its own. More narrowly, Timbali has developed a cut flower cluster around its activities and Fundación Jalisco is doing the same thing with berries.

6 Branderburger, Adam, and Barry J. Nalebuff, Coopetition: A Revolution Mindset That Combines Competition and Cooperation : The Game Theory Strategy That's Changing the Game of Business, 1996, Doubleday, NY.



Chapter 4

Challenges in Agribusiness Incubation

Agribusiness incubators must think and work differently than other types of incubators because the risks they must manage, institutional constraints they face, and competencies and assets available in rural areas are more severe than in other sectors.

4.1 Risk

A distinctive aspect of agribusiness incubation involves the **unique high-risk features of agribusiness markets**. Competing in these markets entails exposure not only to operational, competitive, technology, and consumer risk but also to biological risk (e.g. pests and diseases) and climate change risk. Additional risks need to be managed over the entire value chain where a failure in any specific activity jeopardizes revenue for the entire set of chain participants.

Perishability is a risk that is quite unique to the agribusiness sector, implying the need of specific technologies (e.g. cold storage and cold chains) and coordination of several actors along the chain to ensure that products flow through the chain at the right moment.

Prices in commodity markets are subject in most national markets to unpredictable increases and decreases, as well as to slightly more predictable seasonal increases and decreases.

A major challenge that agribusiness incubators must understand to help their clients is how to **diversify** among different commodity markets or how to add value to commodities and thus move into product markets which are differentiated and more stable in price.

Other risks involve **government policies**. These can significantly undercut the value of commodities being held or traded among private investors. Variable government policies can also affect expectations regarding price, availability and quality of farm products. The following set of government policies are known to distort markets and to make contract enforcement more difficult in developing countries: i) direct government intervention in food staple markets either through food security agencies, regulatory agencies, or branches of government responsible for " price stabilization"; ii) minimum price supports which governments set under key commodities in order to subsidies farmers; iii) preferential access to limited supplies of food staples for parastatal organizations, aid agencies, etc.; iv) input subsidies and input price supports which make trading in input markets more risky; and v) trade barriers erected in response to food security concerns.

As a result of these risks, **fewer entrepreneurs are willing to invest in agricultural businesses than are willing to invest in other businesses**. Agribusiness incubators can therefore not wait passively for investment opportunities to come to them. In the agribusiness sector, incubators must be pro-active in generating interest in new business formation and encouraging entrepreneurs to invest.

Agribusiness incubators must understand these risks well so that they can play an important role in advising their clients on how best to manage these risks. Moreover, incubators can play a role in advocating for policy changes or government programs that could help reduce the risk for agribusiness entrepreneurs.

All of the agribusiness incubators described in this report operate in business environments that can be described as what economists would term "low equilibrium.[7]" The term refers to environments in

7 "A Theory of the Low Equilibrium Trap in Underdeveloped Economies," Richard R. Nelson, the American Economic Review, 1956, pp.894-908.

which markets work inefficiently, public policies are only partially supportive of private investment, and market information is missing.

Agribusiness incubators focused on primary agriculture typically begin their operations in the context of risk-averse agricultural commodity markets, where margins are low, prices variable, and risks associated with starting up private businesses high. In these difficult environments they must deal either directly or indirectly with traditional farm organizations, which are change-resistant because of the existential risks which farm producers face in developing countries. Consequently, agribusiness incubation is a high-risk undertaking[8].

4.2 Institutional Constraints

The perception of high risk with respect to rural business activities affects the **availability of credit and banking services** as well. These effects manifest themselves in a dearth of local financial services, a lack of short term credit for farm production, and a serious scarcity of longer term debt or equity investment. Rural areas in most developing countries have few commercial bank offices, and even when rural areas do have offices, these offices make few loans to local businesses. They only accept deposits. Thus, incubators are confronted with the need to assist their clients in overcoming the finance availability challenge, not only with respect to venture capital, but also with respect to securing short-term credit with which to survive until their cash flow becomes positive.

Another consequence of the scarcity of businesses in rural areas is that many rural areas are underserved with respect to retail outlets and stores that distribute farm inputs. As a result, incubators planning to distribute new products and services into rural areas must solve the **product/service distribution challenge**. In some cases, agribusiness incubators collaborate with rural retail distributors and in others they have no choice but to develop their own retail distribution systems.

4.3 Availability of Competencies and Assets

Small-scale farmers in developing countries possess very limited competencies and very few assets. They are risk-averse because of their close proximity to subsistence, and they have few assets by virtue of their limited capacity to create value. Moreover, economies of scale production and of specialized production are not available to most small-scale farmers in developing countries. **Farm level organizations** sufficiently large to sustain a minimum level of competitiveness and farm level organizations which possess a minimum level of business skills and who inculcate a minimum level of business-oriented values are often missing. **Networks that link small scale farmers to markets**, to input providers, and to sources of technology appropriate to their needs are also often lacking.

Agricultural assets are costly in comparison with the incremental profits which they afford. Essential assets, which are typically part of an agricultural product, like land or irrigation systems, are difficult to finance. As a result, **cash flow to equity ratios are relatively low.**

The economic lives of productive agricultural assets are also long. **The break-even levels** to profitability for these assets correspondingly stretch out over long time periods. Their investment requires "patient equity." For orchard investments, for example, break evens can range between 14 and 18 years, and for grape arbors they are typically 4 years. In both respects assets are mismatched with agricultural product markets, which are typically seasonal and increasingly exposed to global supply risk.

8 Kang. K.G., & Mahajan, N. (2006). An introduction to market-based instruments for agricultural price risk management. Agricultural Management, Marketing, and Finance (Working document 12). Food and Agricultural Organization of the United Nations.

iller, C. (2008, January). Risk Mitigation and Management for Agricultural Investment. Food and Agriculture Organization of the United Nations. EASYPol Module 161.

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Fuksaku, K. (2007). Business for Development: Fostering the Private Sector. Organisation for Economic Co-operation and Development. OECD Publishing.

4.4 Strategies to Meet the Challenges

Against the backdrop of these challenges, every new agribusiness incubator team needs to ask itself: What are the market opportunities the incubator is responding to? Do we fully understand the markets and the value chains that the target enterprises operate in? What is our unique contribution to the agribusiness ecosystem in which we will be operating? What is our strategy for coping with the challenges enumerated above? What are the core competencies of the incubator and how does the incubator propose to strengthen and sharpen these core competencies? How does the incubator build active networks and collations among expert groups outside itself whose support is essential for enterprise development? How does an incubator create unique value or competitive advantage?

Agribusiness incubators have pursued a varied set of strategies to respond to the challenges described above (risk, institutional constraints, and availability of competences and assets). To address risk factors, successful agribusiness incubators have adopted a number of risk management practices, including a combination of technology, institutional, and networking strategies. These are described in Section 8.2. To overcome institutional constraints such as availability of credit and distribution channels, agribusiness incubator managers have been actively involved in facilitating client access to credit and supplier networks. To overcome the limited competencies and assets in rural space described above, agribusiness incubators have been active in establishing networks to link small-scale farmers to markets, promote linkages of SMEs with farmer organizations, help clients evaluate their business plan supported by a clear financial analysis, and overcome limitations in assets through partnerships with the public sector.

Additional strategies discussed in the following sections include affecting priorities for supporting infrastructure development and developing farm-to-market linkages.

4.5 Supporting Infrastructure Development

The coordination work of incubators is most productive when the national/business infrastructure is sound and, more specifically, when it is responsive to the needs of local companies. Economic infrastructure is the foundation that new enterprises and farm-level organizations require in order to work together flexibly, efficiently and reliably, to the extent that they are able to enter a policy dialogue with governments and donor incubators are able to affect priorities for infrastructure development.

In Mozambique Technoserve has been particularly effective in influencing public policy. In Mozambique, policy making, administration of the law, and allocation of public resources has increasingly taken place at lower levels within the government hierarchy. Technoserve deliberately cultivates relationships with local government officials, briefs them on agribusiness sector priorities and needs within their jurisdictions, and engages their support to influence policymakers at the national level. Technoserve has developed a sophisticated system of public interest advocacy for the sectors, which it refers to as "supply chain federalism." This is a system successful in aligning infrastructure development priorities with interests to cashew growers, tropical fruit producers, and most recently Mozambique's rapidly developing poultry industry.

In many of its agribusiness chain incubation processes Fundación Chile plays a critical role in orchestrating the timely development of supportive infrastructure. During the 1980s, Fundación Chile initiated the "Asparagus Cultivation" program, encouraging its export while providing technical assistance to farmers in the introduction of green asparagus, a variety in high demand by the U.S. and European markets. Fundación Chile helped foster this opening of international markets, while dealing directly with the producers, to increase the area planted with asparagus. It also worked closely with CORFO, Chile's economic development agency, the Ministry of Agriculture, and other agencies to coordinate the development of water, transportation, and technology infrastructure. At the onset of the program, Chile was producing 6.2 tons. As a result of this program cultivation techniques were adopted that led to improved product quality and to

considerably increased exports. Towards 1990, Chile's asparagus exports reached 7,550 tons.

4.6 Developing Farm to Market Linkages

In most developing countries, activities taking place at the farm and industrial processing stage of the value chain are often separated not only by distance and time, but also by culture and, in some countries, by language. Linking farms and processing plants is a complex undertaking. With that said, every agribusiness ecosystem contains leading companies whose source of competitive advantage is their ability to work effectively across these barriers and in the process to change the behavior of farmers.

Incubators need to be aware of these sector leaders and need to engage them in further sector strengthening activities.

Essential farm product inputs typically come from a diversity of sources scattered among a number of geographically dispersed providers. Primary providers need to be linked to secondary value added processors by value chains, risk management systems, and a reliable telecommunications system. By testing, refining, and demonstrating new modes of value chain integration, incubators are able to significantly contribute to improving sector competitiveness. Several of the incubators profiled in this report have done precisely that. They include Fundación Chile, Fundación Jalisco, Timbali Technology Incubator, TnsMz, and ABI-ICRISAT.

BOX 3. Oleotop – A Successful Case Of Farm-To-Market Linkage

The case of Fundación Chile is particularly instructive because they have had success in developing farm-to-market chains in agribusinesses ranging from asparagus to berries, salmon, and meat. A recent company co-developed by Fundación Chile, Oleotop, spawned the creation an entire chain of canola oil production destined to supplement salmon feed and human consumption. The production of canola entailed the mobilization of hundreds of Chilean small and large farmers to switch to this new crop. The founder of Oleotop, Karina Von Baer, with the support of Fundación Chile, put together the business plan and got the initial funding of US$7 million to create the seed company and oil processing plant. Through her business, Karina is in turn able to help small farmers gain a firmer foothold in the marketplace. "We provide technology and help them reach government programs that support production and provide market access." She also offers business loans to the small farmers with whom she works directly to ensure that they can produce the following year's crop. The technical backing and reputation of Fundación Chile enabled Karina to provide intermediation services between farmers and the businesses involved in the commercialization of canola and related products. Fundación Chile placed a key "bet" in backing Karina, like they had done in so many other pioneering agribusiness ventures. While the technical details were important, a Fundación Chile manager, Marcos Kulka, chose to "bet" not only on canola, but on the entrepreneur. Karina Von Baer grew up in a rural part of Chile. Her parents were farmers. From an early age, Karina knew the richness of her country's agricultural resources. As a result of her initial investment in Oleotop in 2000, she is now the major shareholder in five enterprises – Saprosem, Granotop, Avenatop, Oleotop and Treetop – that combined employ almost 100 staff and have an annual turnover of US$50 million. While each of the five businesses focuses on a different agricultural product, they are all dedicated to improving the agricultural process, principally related to the wheat and canola value chains. In 2007, Karina was named Entrepreneur of the Year for Chile by Ernst & Young. Karina's and Fundación Chile's success is largely due to their key role in connecting and synchronizing the activities on the farm with the industrial and market ends of the agribusiness value chain.

Chapter 5

Agribusiness Incubators Typology

5.1 Introduction

An overview of all the most important features of all the agribusiness incubators assessed in this study is provided in APPENDIX 4. The common goals of all the incubators assessed in this study include a) introducing and enabling innovation, and b) assisting entrepreneurs by providing them with a tailored service. However, the case studies summarized in this report indicate that no single prototype exists for agribusiness incubators worldwide. Incubators differ from one another in fundamental ways. For example, they carry out different missions; they embody different business models; they finance the services which they deliver in different ways; and they relate differently to the business ecosystems of which they are a part.

This chapter discusses the features which distinguish agribusiness incubators from one another and presents a typology of incubators based on the case studies conducted.

5.2 What Are The Incubators' Distinguishing Features?

Distinguishing features[9] discussed in this section include the following:

- Scale
- Business models
- Forms of public-private partnership
- Strategic affiliation
- Target clients and selection process
- Instruments for driving change
- Level of technology upgrading
- Organizational design

5.2.1 Scale

The ten case studies of agribusiness incubators presented in this report exhibit a considerable variability in scale of operations, ranging from a few tens of thousand dollars per year in operational cost to several million dollars. The variability in scale suggests a considerable flexibility in the incubator model that could be adopted in a range of different situations, including those where very limited resources are available.

5.2.2 Business models

There is a considerable variety in the way agribusiness incubators fund themselves and pursue financial objectives. In all cases reviewed, however, initial capital and the first few years of operations are fully funded by donors, the private sector, or government.

Over time, some agribusiness incubators are able to finance an increasing share of their operational budget through a combination of service fees, consulting fees, marketing fees, and franchising fees. In some cases, like ABI-ICRISAT and IAA-IPB, the incubators are fully funding their operational costs (see Figure 4).

The business model for most incubators is a revenue generation model, where the revenues consist partly of fees from various activities such as consulting and business development services, and partly from rentals on infrastructure and facilities provided.

Typically, these fees are either not levied or are highly subsidized during the early years of the incubator life. As the incubator matures and proves itself as successful in facilitating the growth of

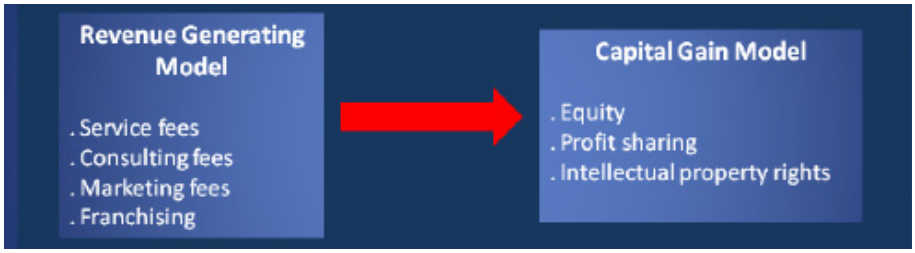
9 In addition to the features mentioned in this section, there are differences in world views, briefly discussed in APPENDIX 7.

10 One company alone, Salmones Antartica, acquired by Fundación Chile in 1981 for US$1 million, and sold in 1988 for US$22 million, prompted a wave of continued equity investment by Fundación Chile during the 1990s and up to today.

sustainable enterprises, it becomes easier for the incubator to levy fees from its clients.

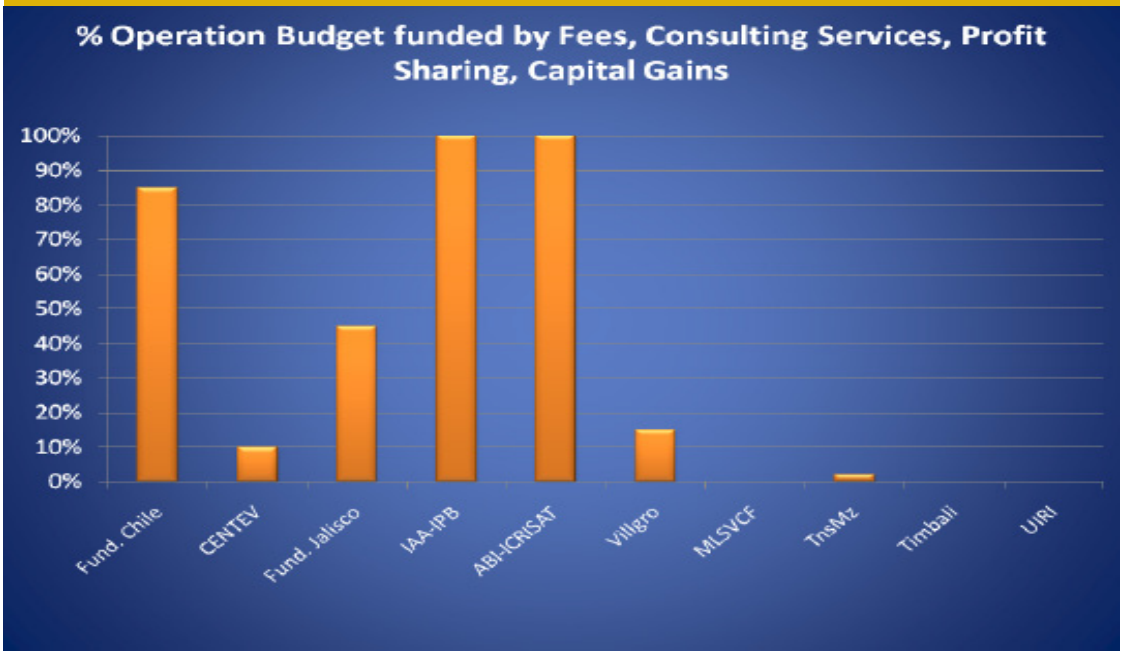
Over time, some of the incubators decide to move from a business model based on revenue generation to a business model based on capital gain. This is based on equity investment in successful incubatees, profit sharing, and intellectual property rights and royalties on technologies developed through the incubator (see Figure 3). The specific modalities of profit sharing, equity investment, and intellectual property rights are not yet codified in a "standard practice" across incubators. ABI-ICRISAT and IAA-IPB are just moving towards a capital gain business model, whereas Fundación Chile has been making profit on its equity investment in start-up enterprises[10] for some time already.

Figure 3 Business Model Transition for Agribusiness Incubators



Source: Authors.

Figure 4 Funding of Operational Costs of Agribusiness Incubators



Source: Authors.

5.2.3 Forms of Public-Private Partnership

Agribusiness incubators face similar challenges with respect to balancing the need to provide additional services against the constraints of limited funding. In order to accomplish more service delivery with less than optimal financing, most of them operate as public-private partnerships (PPP).

Agribusiness incubators can be separated into two generic kinds of public-private partnerships. These include incubators fortunate enough to have secured long-term financing (at least 5 years), ideally in the form of an endowment or equity infusion. This kind of **"capitalized incubator"** typically enjoys a significant degree of decision-making autonomy, with respect both to strategy and tactics. Consequently its strategies for agribusiness development can be wide ranging and may even include direct investments in new enterprises. It can also afford to take more risks, e.g. betting on more investments than it expects to succeed.

At the opposite pole are incubators whose financing is short-term, possibly tied to annual public sector budgets or to program-specific grants. Under these circumstances a **"budgeted incubator's"** management typically surrenders a great deal of decision-making discretion to an outside funding authority or program grantor. In this case an incubator's degree of freedom with regard to the support it can offer its incubatees may be limited to the basics: mentoring and offering of incubator facilities. Typically financial support or direct investment in incubatees is more constrained under these circumstances given the need of balancing against the financial needs of the short term.

The best example of the former arrangement is the oldest and arguably the most successful capitalized agribusiness incubator in the world: Fundación Chile. Fundación Chile was launched in 1976 as a joint venture, non-profit corporation between the government of Chile and ITT with an initial endowment of US$50m and a broad mission to undertake R&D and foster development in agribusiness sectors, in which Chile had little presence. The initial endowment was used between 1980 and 1990. In 2005 the private company BHP Billiton joined Fundación Chile's board and contributed funds matched by the Chilean government to create a new endowment of US$40 million.

IAA-IPB in Bogor, Indonesia is an example of a budgeted incubator. It is dependent on financing from several public and donor sources; principal among these is federal government funding under a diverse set of programs. The Agricultural University of Bogor provides the incubator with offices and space for tenant incubatees. IAA-IPB is still affiliated with that University. Not only is the incubator dependent on its parent institution for facilities, but university policies directly affect its staffing, its mission definition and its functional service delivery capabilities.

Most incubators fall somewhere between the two poles marked out by IAA-IPB and Fundación Chile. Most of them do not have to spend as much of their management time in perpetual fundraising or work with borrowed assets and outside technical staff as does IAA-IPB. Most of them have more strategic control over their priorities, programs and new directions. With that said, few of them are as well endowed as Fundación Chile. Few enjoy the ability to test as many new directions and new models of agribusiness development, or to take the risks Fundación Chile has been able to take, in order to launch entire new agribusiness sectors with their own equity investments.

5.2.4 Strategic Affiliation

One kind of affiliation, which seems to have wide applications, is that between an incubator and a university. IAA-IPB, for example, is closely affiliated with the Bogor Agriculture University, of which it remains a subordinate part.

This kind of strong affiliation affords both benefits and risks. Thus, IAA-IPB's primary sources of value addition derive, at least in part, from the expertise and technology "know-how" of members of the university's faculty. At the same time, the incubator's flexibility and its degree of entrepreneurial freedom are constrained by the university's tight control and by the university's own agenda, which is different from that of the incubator.

The Technology-Based CENTEV/UFV Incubator at the Federal University of Viçosa (UFV) in Brazil was recognized as the best incubator among Brazil's 83 incubators in 2006 by ANPROTEC, Brazil's national association of incubators. The incubator was spawned in close association with the UFV, which is known as Brazil's top agricultural university. It was

created in 1996 and became the path-breaking symbol to convert this "ivory tower" of agricultural research excellence into an "entrepreneurial" university that contributes to local, regional, and national agribusiness and high-tech development. While the incubator was organized as a classic university spinoff business incubator, the unique brand of leadership and the creation of solid alliances within the university and between the incubator and state and federal funding agencies, the incubator was able to create a highly effective system to support university professors and their students to develop successful agribusiness and high-tech companies.

Technoserve Mozambique (TnsMz) is affiliated with an International NGO network, the Technoserve Group. Within the Technoserve Group, TnsMz is autonomous financially, generating sufficient donor support in recent years to progressively expand its programs. TnsMz is also generally acknowledged to be the leader within the group. The approaches and methods, which TnsMz has pioneered, have routinely become "best practice" templates for other Technoserve country operations and, indeed, best practice templates within Mozambique itself. In Mozambique, TnsMz's activities in the cashew, banana, and poultry sectors are generally acknowledged to be successful. As a result, Technoserve Mozambique has earned a level of independence from its affiliated group. For example, TnsMz has recently started up two for-profit businesses that are wholly owned subsidiaries of itself. These two new start-ups will allow TnsMz to operate both at the nano enterprise level and the macro enterprise level where its leverage has been limited in the past.

Two other interesting affiliations involve the parent-offspring relationship existing between the Agribusiness Incubator (ABI) and ICRISAT, and the symbiotic relationship existing between the Malaysian Life Sciences Capital Fund and Burrill and Co.

The International Crops Research Institute for the Semi-Arid-Tropics (ICRISAT) is a non-profit, non-political organization that conducts agricultural research in Asia and sub-Saharan Africa. ICRISAT is headquartered in Hyderabad, Andhra, Pradesh, India, but has additional offices in sub-Saharan Africa. The Ford and Rockefeller Foundations, together with a number of other donor groups and foundations, organized ICRISAT in 1972. Its charter was signed by the FAO and the UNDP. India as its host country has granted it special status as a UN Organization, thus making it eligible for special immunities and tax privileges. Moreover, India granted land to ICRISAT.

ICRISAT conducts research on five drought-tolerant crops: chickpea, pigeon pea, pearl millet, sorghum and groundnut. It also develops crop management systems for semi-arid tropical food crops, which apply efficient and sustainable methods of natural resources conservation. It also advocates policies and creates institutions for improving the livelihoods of poor farmers in drought-affected areas.

ICRISAT started Agribusiness Incubator (ABI) in 2002 under the Technology Business Incubators Scheme of the Indian Department of Science and Technology. The mission of ABI is to facilitate the creation of competitive agribusiness enterprises through technology transfer and commercialization. ABI assists new entrepreneurs with handholding services ranging from business conceptualization to product marketing, to production line implementation, and finally to commercial scale up. ABI has since become the largest and most visible agribusiness incubator in India.

The incubator remains closely affiliated with ICRISAT and supports its parent's mission by disseminating technologies created in ICRISAT labs and experimental farm plots. ABI commercializes some non-ICSRISAT technologies, particularly ones which relate to drought-tolerant agriculture. However, its tie with ICRISAT remains very strong. In recent years some of the transfers ABI has effected between ICRISAT and private companies have included the use of sweet sorghum for ethanol production, BT cotton seed multiplication, the Bio Fermi BTA Fermentor, and multiplication and release of new groundnut and chickpea varieties.

The Malaysian Life Sciences Capital Fund (MLSCF) is a venture capital fund founded in 2006 as a public private partnership. The Malaysian Technology Development Corporation (MTDC), which is a wholly owned government organization, and Burrill & Company, a San Francisco based private merchant bank, co-manage the Fund. The fund currently manages US$150 million in committed capital, which it invests in first growth stage life-science companies. Its mission is to facilitate the

transfer of world-class biotechnology into Malaysia. MLSCF specializes in early stage investments in companies that apply advanced biotechnologies in the areas of agriculture, industrial chemistry, and healthcare. MLSCF has been included in this report of business incubators because of its apparent success in transferring biotechnologies from more developed to less developed countries. The specific technologies of interest to the fund have important implications for agricultural production. Once successfully launched the companies applying these technologies should be able to help transform entire agribusiness sectors and significantly improve farm productivity.

In its technology transfer activities MLSCF pursues two objectives: superior financial returns for its investors and the advancement of the life sciences in and for the country of Malaysia. The governance structure of the fund reflects these dual objectives.

Burrill & Company is the partner primarily instrumental for defining the strategic agenda for MLSCF. Since helping first to conceive and then to organize the fund, members of the Burrill management team have remained active in overseeing the fund's ongoing activities. Burrill & Company specializes in biotechnology and has had extensive experience in investing in first and second stage biotech companies. The company's dual science and venture management competencies span the entire spectrum of the life sciences. However, its competencies in biotech applications in agriculture are particularly strong.

The examples above show a variety of affiliation structures, each of which could provide a strong anchor for the development of an agribusiness incubator. There is no one preferred affiliation strategy; each affiliation structure could be best adapted to a specific environment.

5.2.5 Target Clients and Selection Process[11]

Another important attribute that distinguishes incubators from one another is their primary point of leverage—that is, the entity which the incubator attempts to influence in order to effect change in the surrounding agribusiness ecosystem.

The business domain of incubatees may be very narrowly defined, as is the case with Fundación Jalisco. Fundación Jalisco recruits, trains and co-invests only with blueberry farmers whose products it can assemble, process and market to the US and Great Britain. Since 2008 when it started up, Fundación Jalisco has recruited 200 commercial farmers to produce blueberries on 300 hectares. The incubator has built up an entire supply chain to support these farmers and to facilitate their profitable growth. Incubators like IAA-IPB support the development of a broad array of SME enterprises that participate in multiple business domains, some of which extend well beyond agribusiness.

The Timbali Technology Incubator, based in Nelspruit, South Africa, works on a different point of leverage. It supports the development of black, mostly poor, female aspiring agricultural entrepreneurs located in the Mpumalanga region. Candidates for its mentoring and support programs must qualify under criteria intended to screen for business success in farming.

The Timbali incubator is designed to develop farmer franchisees. It endeavors through a two-level development program to select, prepare, and qualify farmers to produce specific crops (mostly cut flowers), of specified quality, to be timely delivered to Timbali's marketing company.

The Timbali franchisee preparation incubator offers clients a standardized and replicable business structure, which enables them to realize improved livelihoods as long as they deliver consistently high quality products in a timely fashion. Timbali not only provides its incubator clients with resources and training in the system but also with market contacts, a credit history, and vendor introductions necessary to take up an independent, sustainable business

Other incubators, like Technoserve of Mozambique, leverage entire agribusiness sectors. Within specific sectors, TnsMz identifies first movers and industry leaders and works with them to reengineer their business models and to competitively upgrade their business processes. It then engages these sector leaders to show the way forward to other members of the sector through training, workshops, and other forms of knowledge sharing. The incubator engages sector

11 A summary of selection criteria for the 10 case studies is presented in APPENDIX 11.

leaders, for example, to train farm level groups and to provide them with marching grants which they can use to upgrade their farming efforts. In several instances, TnsMz has helped to develop new industry associations through which it works to disseminate competitiveness-enhancing technology, new and better business processes, and business model templates. However, the points of leverage on which TnsMz primarily focuses are industry leaders who are also supply chain integrators.

5.2.6 Instruments for Driving Behavioral Change

Most incubators attempt to influence their clients directly through a rapport, which they develop with them over time. For example, Villgro selects only zero-stage growth potential businesses as incubatees, ones that are likely to respond to the kinds of support services, and to the kind of innovation milieu, which it provides. The offer of business development services, however, is not unconditional. It takes place in the context of a continuous management review of clients' progress in developing their enterprises.

A common approach among most incubators is the one followed by Villgro. Upon entry of incubatees into its program, Villgro performs a comprehensive diagnostic on each incubatee and on that basis develops for each a tailored menu of services appropriate to their specific needs. For their part, incubatees commit to achieve specific development goals. Each quarter the incubator's management compares actual achievements against expected achievements. Enterprises that underperform are asked to leave the program.

Other incubators, especially those whose point of leverage is larger than a single enterprise, must by necessity find and apply other instruments. TnsMz, for example, provides incentives in the form either of soft loans or matching grants in its efforts to change behavior and to introduce new technologies at the farm level within the supply chains which it molds. As noted above, TnsMz works with first-mover agribusinesses that operate from the middle of their respective chains. It engages these sector leaders to show the way forward to other members of the sector through training, workshops, and other forms of knowledge sharing. Competitive emulation and leader-follower dynamics do the rest to motivate change within entire sectors. Importantly, TnsMz engages the same first mover, chain integrators, to choose specific farm level groups whose behavior they want to change and to offer these farm groups marching grants and soft loans programs through them. In order to assure that only serious and committed agribusinesses avail themselves of its support, TnsMz typically charges for its advisory services. Fees, however, account for very little of the non-profit's total revenues.

Other incubators invest directly in the companies they support. Some of them, for example, take equity positions. When they do, they insist on holding board appointments and, in some cases, they insist on holding the chairman's position. In this way, they influence the companies they wish to affect from the inside. This is the case, for example, with MLSCF when it operates as a venture capital fund and with Fundación Chile when it operates as a private equity investor.

Instruments for driving behavioral changes include a combination of incentives and control instruments. As in other features discussed above, there is considerable latitude of choice for agribusiness incubators to achieve their objectives. The common factor, however, is a concern for client performance.

5.2.7 Technology Upgrading

Three different kinds of technology upgrading by incubators can be usefully distinguished, as follows.

- **High tech agribusiness**, which puts cutting edge bio tech and advanced plant and animal science to work, holds out the prospect of improving food security greatly, and, at the same time, of enhancing the competitiveness/productivity of commercial agriculture. Linking biotechnologies to established food systems in developing countries, however, is difficult and risky. Advanced biotechnologies are typically transferred in the form of intellectual property rights, protected through treaty and law. Transferring cutting-edge agribusiness technologies across both national borders and institutional boundaries involves, among other things, transferring these rights. ABI-ICRISAT and MLSCF are the best examples of incubators facilitating these high-tech transfers.

- **Medium tech** is found in commercially available products. In developing economies, the use of

medium technology offers incremental improvements both in agricultural productivity and food quality. However, it may not be available in specific rural areas and to specific entrepreneur groups whose mode of operation an incubator attempts to change. Thus, for example, in their efforts to improve the yields and consequently the competitiveness of the berry farmers who have joined their supply chain, Fundación Jalisco provides its farmers with the best available plant material and the best cultivation and harvesting technologies it can secure, produce locally, and distribute to its supply chain partners. Similarly, the Timbali Technology Incubator supplies improved flower seeds and superior farming techniques to its flower-producing franchisees. Both incubators disseminate the best available technologies in order to strengthen their respective chains.

BOX 4. Villgro Transfer of Technology to Rural Areas of India

Villgro has taken on the challenge of finding, qualifying, producing locally, and distributing medium-tech products broadly to rural communities as its mission. This mission is nothing less than the transformation of rural India from a technologically static and dormant economic space into one where technology-driven change thrives and innovation becomes a new norm. Villgro carried out this mission in several different ways, including fostering innovation through recognition, awards and market feedback. Through its innovator to entrepreneur or I2E program, Villgro matches innovators with seasoned entrepreneurs who are seeking new market-ready products to manufacture, finance and distribute. Villgro markets new products to rural communities directly through its Villgro Stores affiliates, as well as through other distribution channels with which it is affiliated. Through its affiliations with specialized business service providers, Villgro can recommend and arrange for the delivery of specialized business services, such as legal services needed to protect intellectual property rights. Villgro has developed a set of business processes for selecting, incubating, and launching small-scale enterprises whose business strategies entail delivering improved technology to rural communities. The scope of Villgro's technology transfer activities is not specific to any particular use or application. Rather it relates broadly to rural uses and value creation for both rural consumers and rural producers.

- **Indigenous technologies.** Indigenous technologies are locally adapted or locally produced. These include technologies like the new vaccine for New Castle disease, which the Uganda Industrial Research Institute (UIRI) is assisting to develop, commercialize, and distribute through the company Brentech. New Castle disease causes the annual loss of 70% of all Ugandan chickens during the dry season. The company is testing a vaccine to counter the effects of this disease in UIRI's laboratory facilities. Creating new technologies is a slow, costly and uncertain process. It is difficult enough to apply imported technology directly to any specific market or to any local agribusiness environment. Creating new high and medium technologies outside a supportive ecosystem of companies working on parallel tech projects, educational and research institutions feeding the cluster with new ideas, and specialized tech service companies providing support, is doubly difficult. UIRI has not been fully successful to date either in graduating any of its incubatees or in delivering indigenous technologies to market. Brentech is its most promising prospect in the near term.

The adaptability of the agribusiness incubator approach is again proved in the versatility of different technologies that incubators are able to promote, ranging from high-tech to indigenous technologies.

5.2.8 Organizational Design

Most agribusiness incubators have a lean staff and have gone through the process of adjusting activities. The general principle, applicable across incubators, is simply this: Invest in key personnel and develop internal capabilities essential to the core incubation business, and develop strong partnerships with entities who are the very best at what they do. Fundación Chile, for example, currently employees 350 professional staff and engages the services of nearly 300 external consultants. The majority of Fundación Chile's staff is professional with a skill profile equivalent to that of a Bachelor of Arts or Science. Technical and administrative employees combined create the second largest cohort, followed by employees with a master degree. Those with a doctorate degree represent the minority within the organization.

These employees and consultants work in teams within a "matrix structure" that forces collaboration

through teams joining horizontal staff organizations and vertical line organizations. An example is collaboration between experts in specific technologies whose expertise has relevance across multiple sectors and specialists in agribusiness sectors whose marketing, finance and enterprise development expertise is specific to those sectors.

The organizational design used by Villgro is quite different. Its total staff numbers 63. Of these, 32 are involved in incubation activities and most of the remainder are involved with Villgro Stores. Villgro assigns a separate team of experts to each incubatee, which possesses all of the necessary expertise needed to assist it.

Another important feature of Villgro's organizational response to the needs of its incubatees is its assignment of tech-savvy and well-educated young managers directly to incubatees whose own set of human resources may require strengthening. In order to recruit, select and insert well trained and energetic young people into start-up companies, Villgro has developed a Villgro Fellowship Program. Another important feature worth noting is the monthly review of each incubator's progress. A collateral aspect of Villgro's incubation process involves the "eye dropper" dispensation of financial resources. One drop of funding is released at a time to incubatees and then only when they have made sufficient progress against action items included in their incubation plan.

TnsMz employs 63 people who are divided about 50/50 between support staff and professionals. TnsMz maintains a revolving door policy, encouraging its people to move out into agribusiness sectors with which they work, or alternatively into government in policymaking capacities. As a result its alumni association is extremely strong and very influential. A related feature of TnsMz's organization is the thin and porous interface, which separates team members inside TnsMz from industry leaders, industry associations and policymakers outside TnsMz. The non-profit's ability to attract top-notch talent and to function on the public-private sector frontier is due in part to the porous nature of these interfaces. In addition TnsMz's reputation for being able to mobilize world-class resources at high points of leverage attracts the best and the brightest.

The non-profit organizes itself into teams, each responsible for the development of specific agribusiness sectors in which it is active at any given time. Three sets of skills are typically included in each team ensemble: i) analytic skills in market research and finance; ii) strategic industry skills which include know-how and know-who derived from deep private subsector involvement; iii) specialized skills in specific areas posing road blocks to further private investment or related to applying appropriate technologies within subsectors.

5.3 Type of Agribusiness Incubators

The table below describes three types of agribusiness incubators encountered in the case studies, namely (1) agribusiness value chain/sector development incubators; (2) agricultural research commercialization incubators; and (3) technology transfer incubators. The rest of this section discusses the merits of each incubator type and the circumstances under which these specific designs afford the best choice for developers of new incubator institutions.

Table 2 Features of Different Types of Agribusiness Incubators

Tools & Institutions	Defining Features	Examples
Agribusiness Value Chain/Sector Development Incubators		
Supply Chain Network Manager	Targets qualified small holder farmers Organized as supply chain manager Active only in specific sectors where prior studies indicate comparative advantage exists Profit oriented	Fundación Jalisco (Mexico)
Farm to Market Chain Franchisor	Targets qualified small holder farmers Organized as supply chain franchise operator targeting specific sectors Profit oriented	Timbali Industrial Incubator (South Africa)
One Stop- Agribusiness Sector Developer	Large start-up endowment Strong internal research capability; Professional management corps Capacity to apply its own market and tech research, enterprise management, and equity funding to new business start-ups Profit oriented	Fundación Chile
Entire Sector Incubator and BDS Supplier	Pragmatic and sector focused Leverages BDS to transform entire sectors Makes strategic interventions at multiple levels within supply chains Effectively engaged in policy reform both at high levels and at local levels Mix of for profit and non-profit	Technoserve of Mozambique
Agricultural Research Commercialization Incubators		
Agricultural Technology Oriented Incubator With Research Center Affiliation	High-tech focus Strong affiliation with a world class research center Strong initial financial support Classic research park incubator with strong affiliation with research center Non-profit oriented	ABI-ICRISAT of India UIRI of Uganda
Business Incubator with University Affiliation Specializing in Agribusiness	Strong affiliation with a university Classic research park incubator with strong university affiliation Enjoys only weak outside financial support Non-profit oriented	IAA-IPB of Indonesia
Technology-Based Business Incubator	Classic university spinoff business incubator High-tech focus	Technology Based Business Incubator, Fed. Univ. of Viçosa, CENTEV (Brazil)
Technology Transfer Incubators		
Low Tech-Domestic: Rural Innovation Facilitator	Rural low-tech and rural consumer focus Links up innovators and entrepreneurs Leverages multiple methods for promoting innovation Weaver of strong networks Visionary and dynamic leadership Non-profit	Villgro (India)
High-Tech International: Transnational Strategic Alliance	High-tech focus Classic VC design Strong capitalization Clearly defined mission Competent transnational management For profit	MLSCF (Malaysia)

5.3.1 Agribusiness Value Chain/Sector Development Incubators

Agribusiness incubators that specialize in developing value chains or entire sectors include those specializing in providing market access to small-scale farmers. Timbali and Fundación Jalisco fall under this category. Both have developed simple farm level business models that can be learned and applied commercially by large numbers of small-scale farmers. Both provide essential supply chain support services to their clients, including marketing, value-added packing, order fulfillment, logistics, and cash management. Both of them also specialize in producing, selling, and delivering high-value horticulture—in the case of Fundación Jalisco, packed fresh berries, and high-end floriculture (e.g. cut flowers) in the case of Timbali. Neither incubator attempts to work outside its competency and primary business know-how. Both incubators work avidly to refine their business models. Timbali's model is a flower-growing franchise. Fundación Jalisco's is a contract marketing and logistics management service company fused with an incubator function. Both incubators also strive to remain competitive by introducing new agricultural inputs, new cropping methods, and new handling technologies to their incubatees.

Both incubators are also intensely focused on improving the livelihoods of small-scale farmers who in most developing countries, including South Africa and Mexico, possess limited competencies and few assets, and are risk averse. A good deal of the work Timbali and Fundación Jalisco undertake is the creation of farm level organizations in possession of a minimum of business skills and which inculcate a minimum level of business values.

Other important activities of agribusiness incubators which support specialized supply chains involve the creation of networks to input providers and other sources of technologies appropriate to their clients' needs.

Both Timbali and Fundación Jalisco have created a supportive environment which shelters its client farmers from many of the risks associated with agricultural production and, at the same time, allows them to benefit from direct and efficient access to distant niche markets which they could not access on their own.

Importantly as well, new food products require a market test before their launch. Market tests are both too expensive and too complex for small-scale farmers to conduct on their own. Both Timbali and Fundación Jalisco have developed marketing partnerships with other specialized market research companies, as well as their own internal market sounding competencies for undertaking such tests.

Examples of agribusiness incubators specializing in entire value chains include Fundación Chile and Technoserve of Mozambique. Both Fundación Chile and Technoserve of Mozambique possess strong multifunctional agribusiness development competencies. By virtue of their superior market research capabilities, for example, they both afford clients a clear vision of where sources of comparative advantage exist within their respective agricultural economy. They transform comparative advantages in commodity markets into competitive advantages in differentiated product markets. As a result of the strong investment banking skills they both possess, they are able to engineer capital structures for new undertakings, which are appropriately adapted to the business, market and policy risks investors face. Because of the abundant management resources they possess, both organizations have the ability to respond flexibly, quickly, and pragmatically to various challenges and opportunities across multiple agribusiness sectors simultaneously, although Technoserve tries not to undertake more than three agribusiness transformations at any given time. Fundación Chile's project research department, on the other hand, is able to deal with more than 100 projects every year.

Both one-stop incubators are able to offer their clients advantages as a result of their distinctive abilities to analyze agricultural supply chains and to determine where in those chains economies of scale and of scope may be missing and could be added at low investment cost. By mandate and in order to encourage early-stage investments, Fundación Chile always invests at a seed stage in partnership with third-party investors, taking 30 to 40% equity share. It operates as a private merchant banker. For its part, Technoserve is able to advise private investors and to work with them as a financial advisor to direct their investments in Mozambique. Both organizations are called on frequently to provide government officials at various levels within government with policy advice.

Ultimately the comparative advantage of both one-stop agribusiness organizations comes from the breadth of their capabilities to respond to new opportunities and from their ability to recruit highly competent people quickly. Both organizations are agribusiness problem solvers first and foremost, even before they are incubators. Incubation is one method among others which they apply to stimulate growth in the specific agribusiness sectors which they target.

One-stop agribusiness development organizations are particularly effective in situations in which markets for equity capital, specialized business services, expert management and corporate control have not yet developed.

Both of these models are difficult to replicate in other countries given their complex design structure. With that said, forming alliances with them and encouraging them to extend their expertise across borders through some form of joint venture is possible. Indeed, in recent years, a number of efforts have been launched to create entities that use elements of the Fundación Chile model to grow new agribusiness value chains. Among these are two based in Mexico: Fundación Jalisco (FJ) of Guadalajara, which is the subject of a case study included in this report, and Fundación Sonora (FS) of Hermosillo. See APPENDIX 8 for more details.

5.3.2 Agricultural Research Commercialization Incubators

As Mian (1997) has pointed out, incubators afford mechanisms to facilitate the transfer of technology from higher learning institutions and from research centers to new enterprises. The key function of incubators strongly affiliated with research institutions is to accelerate technology transfer.[12]

Arrangements for technology transfer determined solely by a university or research center, as part of their mandate, tend to be more rules-based and less flexible. In general, the stronger the affiliation, the less open to experimentation and refinement are subordinated incubators[13]. Moreover, resource allocation decisions made by the academy tend to relate more to the academy mission than to market opportunity criteria. There is therefore a risk that the technologies developed do not correspond to market opportunities.

Incubators anchored in research centers or in higher learning institutions typically have a broad governance platform involving many diverse stakeholders as indicated by Lalkaka (2001)[14]. An important tradeoff which is designed into most university- or research center-affiliated incubators is one between faster rates of innovation and broader community or business goals. These generalizations appear to apply to the three incubators included among the case studies—ABI, affiliated with ICRISAT in India and fully committed to fast rates of technology innovation; IAA-IPB, affiliated with Bogor Agriculture University in Indonesia and committed to community development; and Technology Based Business Incubator, affiliated with the Fed. Univ. of Viçosa, CENTEV in Brazil. The latter incubator is also committed to fast rates of technology innovation.

Strong affiliations with institutions of learning and research carry both benefits and risks. Thus, IAA-IPB's primary source of value addition derives, at least in part, from the expertise and technology "know-how" of members of the university's faculty. At the same time, the incubator's flexibility and its degrees of entrepreneurial freedom are constrained by the university's control and by the university's own agenda, which is different from that of the incubator.

Over time, the IAA-IPB incubator management has put a greater effort in networking with government organizations responsible for SME development, financial institutions, local government, and other national and international incubator associations. This networking has resulted in better access to resources which have recently resulted in new infrastructure and equipment investment.

Technology-Based CENTEV/UFV Incubator at the Federal University of Viçosa (UFV) has been recognized as the best incubator among Brazil's 83 incubators in 2006 by ANPROTEC, Brazil's national association of incubators. The incubator, created in 1996, was launched in close association with UFV, Brazil's top agricultural university.

12 "Assessing and Managing the University Technology Business Incubator: an Integrative Framework," Sarfraz A. Mian, Journal of Business Venturing, 1997, vol 12, pp 251-285

13 Ibid.

14 "'Best Practices' in Business Incubation: Lessons (yet to be learned)." Rushtqam Lalkaka, EU Conference on Business Centers, Brussels, November 2001.

It quickly became a pioneer in breaking a new path for technology commercialization. While the incubator was organized originally as a university adjunct, a unique combination of leadership and solid alliances within the university and between the incubator and state and federal funding agencies enabled the incubator to create a highly effective system for launching successful agribusiness and high-tech companies. Both faculty members and their students have become enthusiastic participants and high-tech entrepreneurs. Since 1996, the incubator graduated 25 incubatees, with a 100% success rate with all businesses graduating within 2 years. The average annual revenue which the incubator's clients generate three to five years after graduation is US$2.5 million.

CENTEV/UFV's success depends on its excellent deal flow, as well as on the unique entrepreneurship/science mix found among UFV faculty members. CENTEV/UFV's well structured operating procedures, its customized software for supporting new business development, its ready access to the best available state and federal research, as well as its strong working relationships with venture capital agencies, provide it with additional advantages. Most importantly, however, is the continuing legacy of leadership excellence, which the founder of the incubator provides and which continues to inspire its current management, staff, and incubatees.

ABI is affiliated with ICRISAT, the International Crop Research Center for Semi-Arid Tropics. Initially, the mandated crops of ICRISAT and the associated technologies defined the scope of work for ABI. Very soon, however, the scope of work expanded and ABI has been engaging with the promotion of companies ranging from biotech to organic farming, from agricultural equipment to biofuels. The success of ABI in promoting agribusiness and innovations is largely based on a tradition of excellence of the research programs at ICRISAT and partly on a new business orientation provided by ABI's management trying to bridge the gap between scientists, farmers, and the market. ICRISAT's strong brand in India has facilitated the work of ABI in agribusiness development. The success over the past decade has also led to the Government of India choosing ABI-ICRISAT as the lead incubator in the national network of agribusiness incubators (NIABI) with the task to help new agribusiness incubators to grow. One limitation of the ABI-ICRISAT model is the difficulty in replicating the ICRISAT brand name. ABI-ICRISAT is progressively moving towards the incubation of other incubators in India, rather than replication of its own model. In Africa, ABI-ICRISAT has been trying since 2007 to study opportunities for developing agribusiness incubators in Mozambique and Uganda, but so far there have not been results.

5.3.3 Technology Transfer Incubators

Technology transfer incubators operate either at the low-tech (e.g. Villgro) or at the high-tech (e.g. MLSCF) end. Villgro works at the grassroots of rural India, aiming to build wealth at the base of the rural pyramid. Villgro incubates a diversity of small-scale businesses which sell their innovative products into underserved rural areas, and it supports the development of new productivity-enhancing farm products, new consumer products designed for rural households, and new services which interconnect economic opportunities between rural and urban spaces.

This non-profit organization with fewer than 90 employees has as its overriding goal nothing less than the replacement of a technologically static rural space in India with one that is dynamic and highly absorptive of relevant new technologies. Villgro employs a variety of methods, programs and incentives to accomplish its mission. It disseminates the commercial knowledge which it generates broadly through example, through competitive challenge, and through high-visibility promotion. The incubator has developed strong relations with a number of network partners. Importantly, Villgro operates its own network of retail outlets, called Villgro Stores.

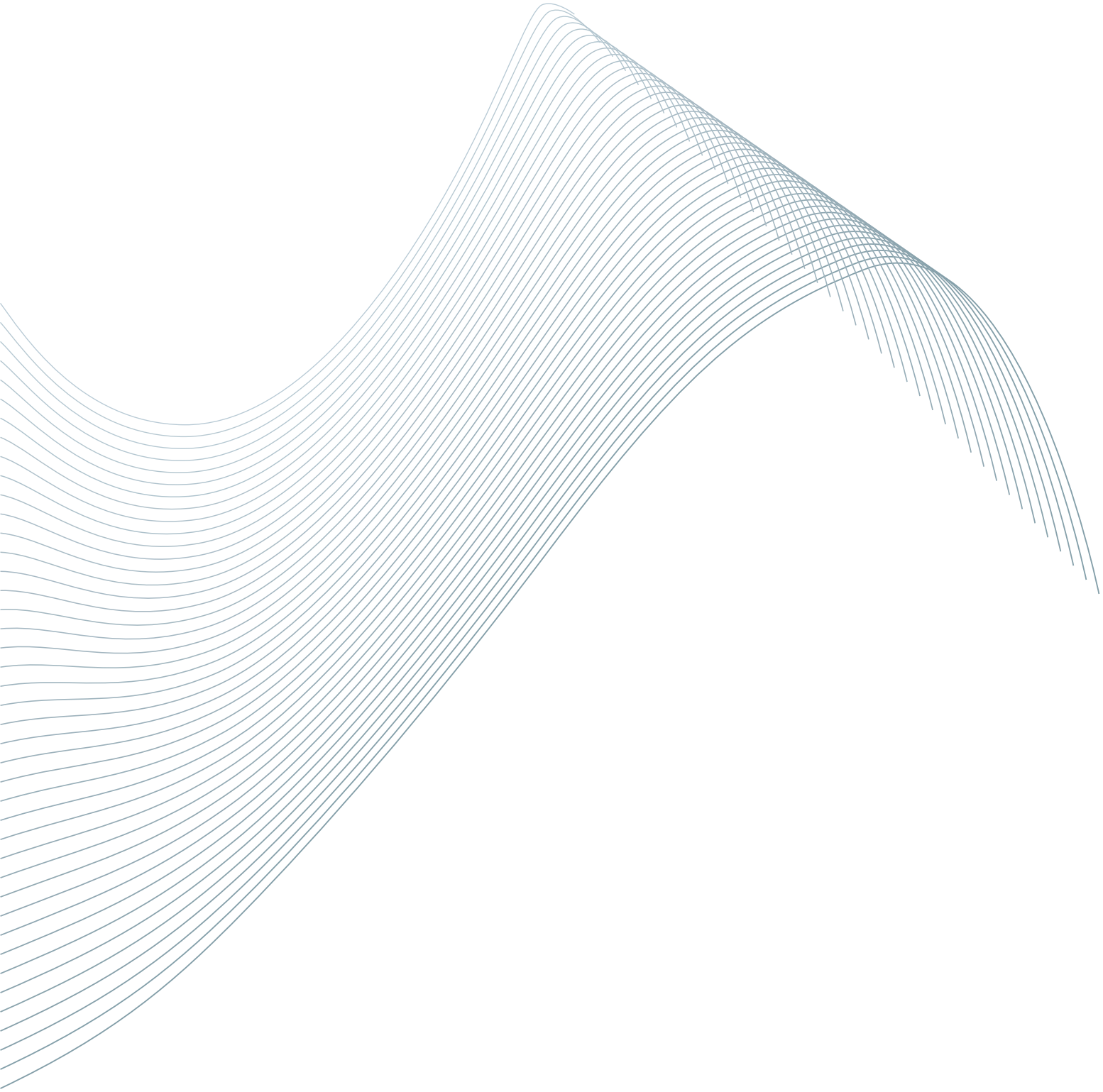
Villgro includes multiple resources to accelerate indigenous technology take-up. These ancillary methods include knowledge creation, knowledge sharing, competitions and awards, and own-operated retail distribution chain and brokerage between technology innovators and entrepreneurs. It entails a nascent cultural transformation, a transformation in rural confidence, speed to change, adaptability and network interconnectedness.

A new form of a jointly managed and jointly invested biotech venture capital fund is being tested in Malaysia, where a local development institution is

partnering with a biotech venture capital fund based in San Francisco to develop a local fund, called the Malaysian Life Sciences Capital Fund. What is most interesting about this undertaking is that the Fund is attempting to transplant transformative technologies into Malaysia which hold out the promise of significantly expanding the usefulness of oil palm and other basic farm commodities in Malaysia.

The methods and the skills required to develop cutting-edge biotech companies are unique and difficult to learn except by doing. The challenge associated with transferring these skills to Malaysia involves not so much the launch of a new biotech companies as it does the transfer of advanced technology across borders from concept to product and ultimately to market.

Incubators can play a useful role in the zero-stage development of cutting-edge biotech companies. However, several echelons of funding and mentoring support are required to bring new biotech products to market. Each of these echelons become more specialized and more expert. MLSCF specializes in developing first-stage companies (ones aiming to fully test market their products at the end of their first round of venture capital financing). Its larger role, however, is to facilitate the transfer of biotechnology across borders and across corporate boundaries in the multiple forms of IP, contract manufacture, and joint technology ventures into Malaysia.



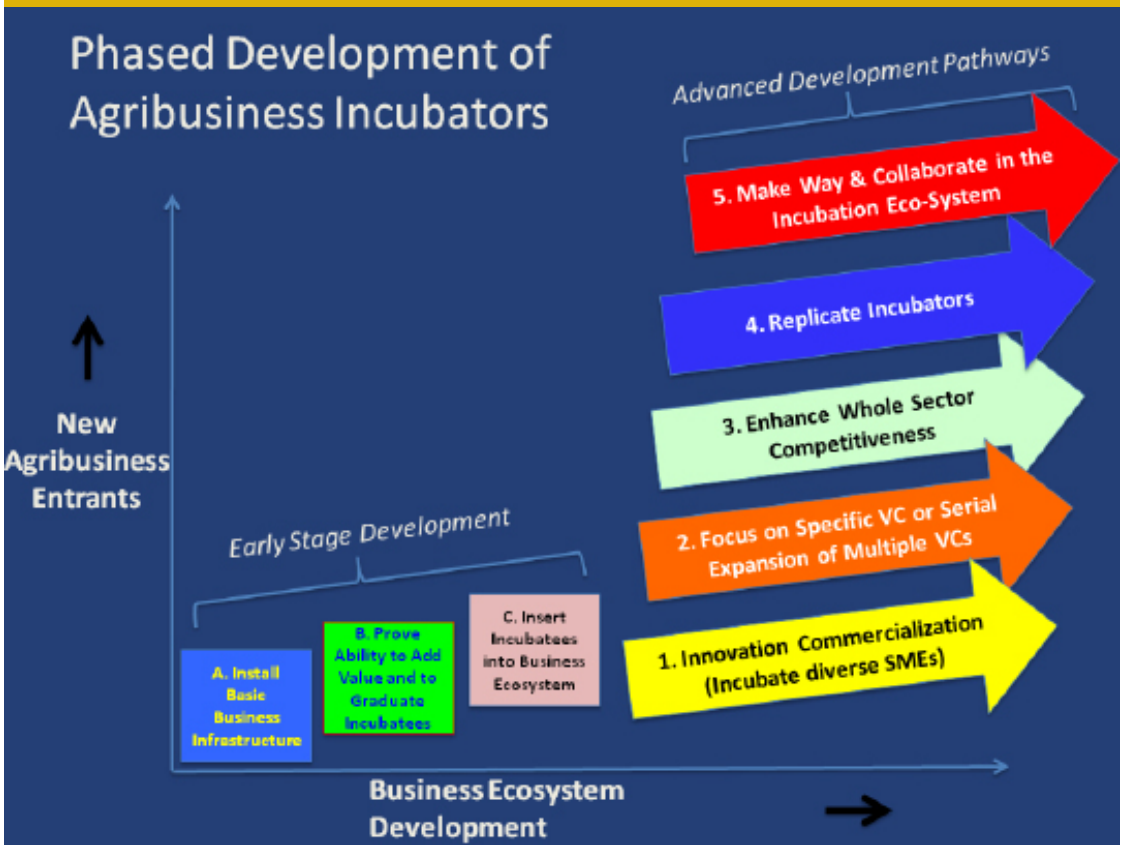
Chapter 6

Evolution of Agribusiness Incubators

6.1 The Phased Development of Agribusiness Incubators

Agribusiness incubators evolve in different directions over time in response to an evolving agenda for enterprise development which is determined in large part by changes in their business ecosystem and corresponding changes in incubator strategy. The project team's review of diverse agribusiness incubators suggests that all pass through similar early stages of development, but subsequently pursue alternative pathways of development over time. The figure below depicts three stages of "early stage development" and five alternative pathways for more advanced development and scale-up of agribusiness incubation.

Figure 5 Phased Development of Incubators



Source: Authors.

6.2 Early Stage Development

Agribusiness incubators typically engage in a series of early stage development activities on the way to establishing themselves as viable players in the incubation process. These stages might be called the ABC's of establishing an agribusiness incubator:

Install the Basic Business Infrastructure

Building an institutional foundation sufficiently sturdy to support the delivery of business support services and, at the same time, sufficiently transparent to satisfy the requirements of donors and financial supporters poses a first and significant challenge for many incubators. This first stage entails a number of steps, each of which is simple to state but which may be difficult in practice to implement:

- Feasibility study and risk analysis regarding the likely success and specific management action agenda for the incubator;
- Development of a clear and comprehensive mission statement and corresponding set of results indicators;
- Recruitment of a competent and inspired management team. Ideally, one with prior agribusiness experience at the executive level;
- Initial fundraising;
- Development of selection criteria and a selection process for accepting enterprises into the incubator;
- Defining core business processes and developing systems to support them. These systems would include accounting systems, budgeting systems, costing systems, and client activity-monitoring systems;
- Development of network connections sufficiently strong to generate desired deal flow;
- Design of layouts and equipment for facilities suitable for supporting incubatees;
- Selection of an independent board of directors which includes experienced, knowledgeable and principled persons of good character; and
- Implementation of appropriate methods of corporate governance and management accountability assurance. Good practices for business incubation are generally outlined in further detail on www.idisc.net.

Prove Ability to Add Value and to Graduate Incubatees

Testing the effectiveness of a new incubator's enterprise support systems for the first time marks a second critical development plateau. The ultimate proof of an incubator's ability to create value is their demonstrated ability to graduate clients who continue to grow after graduation and to generate progressively increasing levels of profit.

Most clients enter a business incubator as "zero-stage" companies. "Zero stage" means a company which has developed a business plan but which lacks a market-ready product and has not generated any revenue. Incubators make their best efforts to raise the enterprise maturity of their clients to "stage one" before they graduate. Stage-one companies possess market-ready products, which they have successfully test marketed and as a result they have generated limited revenue. The first class of graduates marks a successfully completed final exam of sorts for the incubator itself, an exam which proves its ability to create value within emerging companies through the services it offers and the mentoring it provides.

Insert Incubatees into the Business Ecosystem

Understanding the importance of full integration into a national agricultural system and being able to effectively introduce new enterprises into that system marks a third critical development plateau. Agribusinesses can be only as successful as their suppliers, their service providers, and ultimately their customers. The nexus of commercial relationships into which incubators introduce their clients are their business life support system. These relationships must serve incubatees effectively until they are capable of realigning and reinitiating them on their own. This typically takes one to two years.

Every emerging agribusiness has different needs for external support, but in general, the higher the quality and reliability of its trading partners, the more competitive the enterprise. Agribusiness ecosystem support is essential initially on four fronts: i) farm inputs, ii) other supplier inputs, iii) service inputs, and iv) customers. In order to provide their clients with useful advice and effective network introductions, incubators must possess tacit and up-to-date knowledge of all four markets which support their incubatees. Incubators can only provide this kind of tacit knowledge if key members of their staff have been involved recently in these markets as buyers, sellers or ancillary service providers. In order to deliver value to their clients,

incubators need to be fully versed in all elements of the business ecosystem. In this aspect of incubation, "know-who" is more important than "know-how."

6.3 Advanced Development Pathways

As incubators pass through the initial development stages, they face alternative development pathways. Based upon our review of incubators we identified five advanced development pathways. These pathways are not mutually exclusive, but they are presented by increasing degrees of complexity,

- Technology Commercialization—the incubation of diverse agribusiness SMEs
- Focus on a Specific Value Chain and/or Serial Expansion of Multiple Value Chains
- Enhance Whole Sector Competitiveness
- Replicate Incubators
- Make Way and Collaborate in the Incubation Ecosystem

One of the critical choices that agribusiness incubators make is whether to specialize or remain open to diverse technologies and value chains.

6.3.1 Technology Commercialization-the incubation of diverse agribusiness SMEs

Many agribusiness incubators choose to support the commercialization of agribusiness innovation, irrespective of the value chain or sub sector involved. This kind of incubator most resembles a general business incubator but with a focus on agribusiness industry. The two university-based incubators among our cases, IAA-IPB and UFV/CENTEV, illustrate this advanced development pathway. Both are engaged in supporting the commercialization of agribusiness innovation, no matter what value chain or sector. The focus of the incubator is more on the development of specific SME companies and less on the development of any specific value chain or sector. The difficulty with this approach is that the incubator cannot possibly be intimately familiar with all agricultural value chains. For such incubators, it is therefore critical to develop deep and adaptable external networks of specialized experts and specialized third party service providers.

6.3.2 Focus on a Specific Value Chain and/or Serial Expansion of Multiple VCs

Other incubators choose to focus their attention on the development of companies and support activities within one or more specific value chains. Timbali was launched with the single focus of development of the cut flower value chain. Similarly, after reviewing various agribusiness technologies, Fundación Jalisco decided to focus on the development of the blueberry value chain. Both incubators spent their early years developing various dimensions (farmer development, seed and plant nurseries, marketing and commercialization) of the specialized business models which serve specific value chains particularly well. Subsequently their primary challenge is to identify, recruit and engage micro enterprises and aspiring commercial farmers able to execute the basics of these business models. Once they have succeeded in designing and refining franchiseable business models in one subsector, they look to replicate the business franchise development success in other promising value chains.

6.3.3 Enhance Whole Sector Competitiveness

Some agribusiness incubators never reach the stage of being able to operate at the level of an entire agribusiness sector, as contrasted with operating at the level of accelerating individual enterprises. However, those which reach the sectoral level are able to effect significant improvements in the lives of tens of thousands of rural and urban households. In order to operate at this level an incubator must have professional and visionary leadership. It must also have the analytic capability needed to assess comparative advantages within specific sectors and competing value chains.

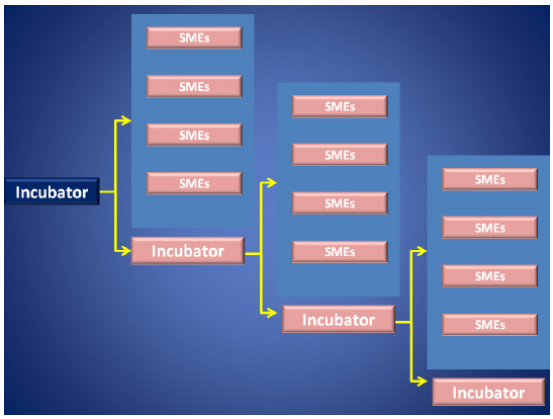
In addition, stage four incubators require staff capacity to assess new opportunities strategically. For example they require the capability for benchmarking and analyzing value chains so that they are able to diagnose strengths or weaknesses and develop programs for strengthening farm-to-market chains in each link. They need to be able to assess the appropriateness of alternative technologies for carrying out specific business functions within chains and further they need to be able to assess the kinds of financial structures and the potential returns to investors associated with undertaking investment commitments within specific chains.

Other prerequisites for operating at this level include: i) the ability to transfer appropriate technologies across borders; ii) the ability to form and motivate apex organizations which represent the sector in the public policy arena; iii) the ability to operate as a business broker and in this capacity to facilitate structural changes within the sector through mergers, strategic combinations, acquisitions, and reassignments of fixed assets; iv) ability to mobilize equity private capital in order to respond to specific opportunities; v) ability to carry out transactions which facilitate the consolidation of target sectors horizontally as well as affecting their integration vertically; vi) the capability to secure access to government policymakers at the highest level and to present policy positions to them which are well justified and empirically supported and which should deal at a high level with a host of issues affecting sector competitiveness; and vii) ability to build strong network linkages with a) specialized logistics service providers; b) capital equipment manufacturers; c) venture capital and private equity investors; and d) with the managers of multiple distribution channels, including both export and domestic.

Two examples demonstrate these developments. Technoserve of Mozambique has matured and evolved to the point where it is launching a new investment advisory service. Technoserve of Mozambique intends this new for-profit service to facilitate foreign direct investment in agriculture and agribusiness. It proposes to clarify local laws and regulations, to facilitate the compliance of foreign investors with these rules and regulations, and on behalf of large investors to implement all of the safeguards which apply to land and water use for agriculture. Technoserve's new for-profit company intends to charge for its services on a fee-for-service basis and at the same time to assure that rural community safeguards, environmental protections, and labor market regulations are all strictly complied with. In this way, the incubator will be able to protect investor interests and, at the same time, realize a larger measure of collateral social benefits from foreign investment.

A second example involves Fundación Jalisco in Mexico. This incubator has developed a set of business models for medium- to small-scale farms which link local producers of berries (e.g. blueberries, strawberries, etc.) to buyers in the US and Great Britain. Essentially, the Mexican incubator has developed a supply chain which is expandable and which links incubatees to foreign markets and passes back to them prices for quality controlled and artfully packaged berries which are highly remunerative.

6.3.4 Replicate Incubators and/or Densify the Incubation Ecosystem



Advanced incubators replicate and scale up through the incubation of new incubators. Scaling up and replicability are the real test of the efficacy of the incubating approach to agribusiness development. The evidence reviewed so far shows promise. Fundación Chile has been incubating the development of other incubators in Mexico (Fundación Jalisco and Fundación Sonora) and in Peru (Fundación Perú). Similarly, ABI-ICRISAT has been incubating 10 incubators in India. Replication and up-scaling will be facilitated by a policy framework favorable to the emergence of agribusiness incubators.

6.3.5 Make Way and Collaborate in the Incubation Ecosystem

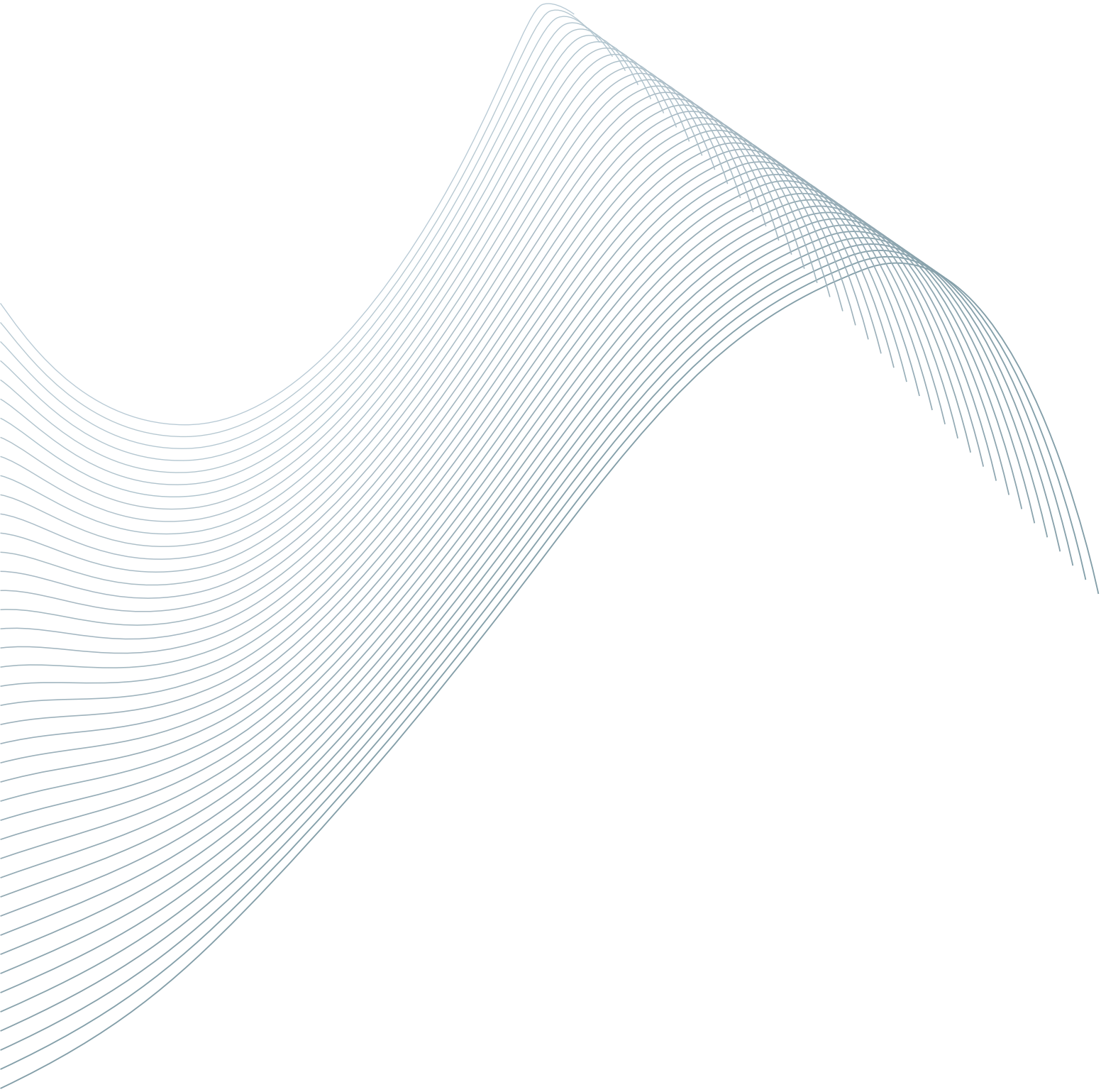
Ironically, as agribusiness incubators mature they are confronted with the need to become smaller, or at least narrower, in the array of services they provide and the ways in which they interact with their business ecologies. The challenge, as business environments mature, is to adapt the business incubation model to stay at the forefront where other actors have not yet entered, thus fulfilling its demonstration purpose.

At this point, a broad mission-committed incubator needs to become almost exclusively involved with sector statesmanship, developing new visions, managing other, more vital experts, and thus removing themselves from participating in every phase of the incubation process.

BOX 5. Illustration of Phased Development: Fundación Chile

Because of its long history as an agribusiness incubator, Fundación Chile provides important insights for other incubators. As noted above, every incubator follows a development trajectory that corresponds to the opportunities and risks emerging within its business ecosystem. For these reasons, no two incubator development tracks are exactly alike. The evolution of Fundación Chile's incubation process demonstrates this general fact. Although its development can usefully be divided into five stages, each of these is slightly different than the generalized stage discussed above because they emerged in distinct competitive contexts.

- Stage 1-Building an Organization for Innovation (1976-1980)
- Stage 2-Value Chain Development and Strategic Investments in Pioneering Enterprises, The "Big Bets" Era (1980-1990)
- Stage 3-Continuous Reinvention and Adaptation (1990-2000)
- Stage 4-Strategic Interventions in Value Chain and Continued Reinvention (2000-2007)
- Stage 5-Finding New Niches in the Innovation and Incubation Ecosystem (2008-2011)



Chapter 7

Impact and Cost Benefit Analysis of Agribusiness Incubators

Chapter 2 indicated agribusiness incubators as one approach toward commercialization and modernization of agriculture, as well as the promotion of a competitive indigenous agribusiness industry. The specific contribution of incubators to this transformation of the agricultural sector is through nurturing early-stage innovative enterprises that have high-growth potential to become competitive businesses.

This chapter presents the available evidence on the impact of incubators on the **creation of sustainable and competitive agribusiness enterprises.**

The chapter analyzes the impact of agribusiness incubators on (i) agricultural commercialization and upgrading of value chains and value adding activities; and (ii) creation and acceleration of individual agroenterprises that generate income and in turn lead to tax revenues.

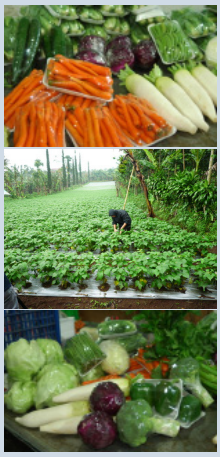
7.1 Impact on Agricultural Commercialization and Upgrading

The development of sustainable and competitive agribusiness enterprises is linked to two major transformations in developing countries: the transformation of agriculture from subsistence to commercial and the transformation (or modernization) of the economy from one mostly based on agriculture to one mostly based on services and industry. The latter transformation is often referred to as the structural transformation of agriculture. During this transformation the share of agriculture in GDP declines, but the share of agribusiness and agroindustry increases.

The success stories of the agribusiness incubators provide a vivid illustration of their contribution to commercialization and modernization. The IAA-IPB incubator facilitated smallholder vegetable farmers in the mountains of West Java, Indonesia to organize themselves and their supply chain so that they are able to sell their produce to supermarkets and fast food chains in Jakarta on a daily basis (see Box 6). This transformation not only improved the overall livelihoods of farmers but the connection of rural space to urban space was enhanced and higher income and increased food safety resulted among stakeholders in the value chain.

Villgro is helping micro and small enterprises to develop their potentials into sustainable rural businesses. ABI-ICRISAT has helped commercialization of subsectors (e.g. pulses seeds) that were hardly seen as an area for agribusiness. The Timbali incubators helped poor and underemployed women in South Africa to become franchises in the cut flower value chain, a modern value chain that is highly competitive and demanding in terms of quality and technology requirements. Fundación Chile has created world class business in innovative fields which have changed the composition of Chile's agricultural exports. Technoserve Mozambique has led the upgrading of entire subsectors such as poultry and cashew nuts.

BOX 6. Fresh Vegetables Supply Chain from Hills of West Java to Jakarta



Mr. Unang is a vegetable farmer located in the hilly areas (1000 meters altitude) of Cianjur in West Java and provides a variety of fresh vegetables to Jakarta. Among his produce are fresh lettuce, cucumber, tomato, onion, pak choy, carrot, baby green bean, celery, cherry tomato, and leafy vegetables. His sales provide sufficient supplies for 10 outlets in Jakarta. Every day he ships 2 trucks full of fresh vegetables, 2 times per day. Each trip takes 3 hours. Each truck transports between 500kg to 1 ton, 7 days/week.

Only a small part of the produce he sells comes from his own land (2 ha); most of the produce is sourced from 10 farmer groups representing a total of 100 farmers. All together they cultivate about 60 ha of vegetables.

Mr. Unang first contacted the IAA-IPB incubator in 1996 and became an incubatee in 1999. He found the incubator useful to his business particularly in terms of training (e.g. packging) and access to credit. In fact, the incubator facilitated him to obtain an initial credit of Rs. 35 million (US$3,500) which later increased to Rs. 150 million in 1999 (US$15,000). The incubator also facilitated his participation in a 2-month training course in Japan on the management of fresh vegetables. In 1996 he started contacts with supermarkets (facilitated by the incubator) for deliveries of 2 trucks/day.

Supply to McDonald's started in 2000 and was later discontinued in 2006 because of stricter policy requirements by McDonald's. The fast food company required moving production to an industrial area and adherence to good manufacturing practices (GMP). He did not have difficulty with adherence to GMP, but the move to an industrial area would have represented an investment that he could not afford. At about the same time, he became supplier for Wendy's and he continues to be a Wendy's supplier today. According to Mr. Unang, Wendy's is more flexible than McDonald's; moreover he can make 20% more profit, and benefit from a variable price in the contract (differently from McDonald's, which uses fixed prices).

In addition to his own packing house, he uses the cooperative's packing house. Total sales volume of the cooperative is on average 15-20 tons/day. The advantage of being part of a cooperative is negotiation with supermarkets and higher negotiated price (20% higher). Each member of the coop supplies directly to the supermarket, but the price is negotiated collectively.

He is currently planning to build 2 screen/plastic houses of 1,500 m2 for a cost of Rs 35 million. He intends to avoid pesticides and wants to be a certified organic farmer and dealer of fresh vegetables, a plan that might be possible to implement in his area which is relatively high-altitude and less exposed to pests.

His company won a National Award for Agricultural SME innovation for his work on building a sustainable operation linking vegetable farmers from high hills to modern urban retail chains. His total sales in 2010 were 1.3 billion (US$130,000) up from less than Rs. 300 million (US$30,000) in 1999 when he joined the incubator. His direct costs are about 20% of sales and his margins about 30%

He plans to increase the size of his business through the development of organic production and retailing. Another plan is to invest with a group of like-minded people in a retailing cooperative. That investment will be considerable, but he believes that the expected benefits will be high. He is currently writing a new business plan, and under the GMP of McDonald's, he will need capital of Rs. 6-10 billion (US$600,000 to US$1,000,000).

Commercialization and upgrading have often been the result of supporting innovation. The agribusiness incubators visited in the case studies have all been leaders in innovation, facilitating the adoption of new technologies, new products, and new management systems. Examples of remarkable impacts are listed in Table 3.

The innovations have ranged from sweet sorghum in biofuel production for ABI-ICRISAT to salmon rearing or boxed beef at Fundación Chile, franchising in flowers at Timbali to new distillation techniques for essential oils in IAA-IPB. The innovation has included high technology like in the case of advanced biotech at MLSVCF, CENTEV, and ABI-ICRISAT, or upgrading of existing technology like in the case of IAA-IPB, process innovations like franchising at Timbali and Villgro stores, and supporting new vaccine production at UIRI.

Table 3 Examples of Major Impacts of Agribusiness Incubators

Incubator	Example of Impact
Fundación Chile, Santiago, Chile	Salmon industry in Chile: from 347 tons production in 1983 to 383,000 tons in 2005, about US$2.2 billion exports in 2006, and more than 35,000 direct and indirect jobs created.
CENTEV/UFV Technology Incubator, Federal University of Viçosa, Viçosa, Brazil	DAP Florestal was started by two students from the forest engineering department at UFV in 2006 who saw the market need for an improved `forest inventory system. With the help of the incubator they developed software, graduated in 2010 and their sales in 2011 reached US$650,000.
Fundación Jalisco de Innovación y Desarrollo, A.C., [Jalisco Foundation for Innovation and Development, Inc.], Guadalajara, Mexico	Began blueberry program in 2008, as of 2011 have more than 220 producers growing 1.4 million blueberry plants on over 300 hectares, exporting blueberries to U.S. and U.K. markets.
Incubator for Agroindustry and Agribusiness– Bogor Agriculture University (IAA-IPB), Bogor, Indonesia	Tricoco, coconut based drink in Indonesia. Ms. Aprisusi started with a loan of about US$1,200 facilitated by IAA-IPB in 1999 and she is currently running a successful and growing business of more US$2 million in sales per year.
Agribusiness Incubator – ICRISAT, Hyderabad, India	Biofuel industry development using sweet sorghum technologies developed by ICRISAT to convert into ethanol. Innovation consisting in using food crop to produce biofuel without affecting food security (the grain and the stalk would be used for food and ethanols, separately)
Villgro Innovations Foundation, Chennai, India	Facilitated the growth of a company (Wondergrass) specialized in the design and prefabricated construction of low cost rural housing made from bamboo, to respond to the chronic housing shortage in rural India. Wondergrass prefabricated houses are designed and priced to be affordable.
Malaysian Life Sciences Capital Fund, Kuala Lumpur, Malaysia.	Facilitated the transfer of advanced biotechnology for improving oil palm yields and reduction of waste to Malaysia through joint ventures, intellectual property rights transfers and co-investment in shared technologies.
Technoserve of Mozambique, Maputo, Mozambique	Facilitated the development of new Chiquita Brand managed supply chains for bananas by linking up large scale producers in the Nacala Corridor to the Chiquita Band merchandising, order fulfillment, logistics and global super market supply system.
Timbali Technology Incubator, Nelspruit, South Africa	Poor women previously unemployed or underemployed becoming assertive and economically independent small entrepreneurs producing flowers as part of a franchising operation that allow them to sell more than US$30,000 per year per producer.
Uganda Industrial Research Institute (UIRI), Kampala, Uganda	Brentec Investments producing livestock vaccines to prevent New Castle Disease, affecting 70% of the poultry industry in Uganda.

7.2 Creation of Sustainable and Competitive Enterprises

A full cost benefit analysis of agribusiness incubator investment is available only for one of the case studies, namely for Fundación Chile (see APPENDIX 12). The Study shows that US$1.303 billion benefits of the seven selected programs are 23% higher than the US$1.05 billion in total costs of Fundación Chile over the 30 year period. For other incubators such in depth analysis either is not possible due to the recent period of establishment of the incubator or lack of data.

For other incubators, we have attempted a partial evaluation of impact and cost benefit analysis.

Perhaps the most important metric to evaluate the impact of an incubator is the number of competitive agribusiness enterprises that the incubator has helped to nurture and the total sales revenue of those enterprises vis-à-vis the amount invested in founding and operating the business incubator over the same time span. Typically this is related to the number of incubatees and graduates of the incubator.

For the incubators on which we have information (see Table 4), the number of graduates varies greatly from just a few (Jalisco) to hundreds (TnsMZ). The sales of the graduate enterprises range from just US$30,000 for Timbali to large size (US$5 million) for Fundación Chile.

An attempt to infer some idea about cost and benefit is to compare the initial cost of investment to the actual value of sales of graduate companies. This is a very rough measure, but in the absence of other more detailed measurements it could still provide an indication of the effectiveness of the incubator in using the initial capital to fulfill its mission. From this point of view, the case studies show an excellent performance of CENTEV (ratio sales/investment = 60.4) and Villgro (ratio=44). ABI-ICRISAT (ratio=17.8) and IAA-IPB (18.7) also seem to be excellent performers, indicating a good impact obtained from relatively low investment levels.

In conclusion, with the exception of the Uganda case (where ratio=0 since no company has yet graduated), most of other incubators seem to have a reasonable impact in terms of stimulating growth of competitive enterprises. Their cost/benefit ratios seem also to be favorable.

A more in-depth assessment spending significant time in the respective countries to track down and survey entrepreneurs would be needed to obtain a fuller picture of the impact these incubators have had and the cost-effectiveness of their interventions.

Table 4 Graduates, Sales, and Initial Investments in the Case Study Incubators

Incubator	Graduates	Average Sales (US$ million)	Starting Year	Average Graduate per year	Initial Investment (US$ million)	Investment in Current Prices (US$ million)	Sales of Graduates (US$ million)	Sales/ Initial Investment
Fundación Chile	85	5	1976	2.4	50	182.90	425	2.3
CENTEV	24	2.5	1995	1.5	0.7	0.99	60	60.4
Fundación Jalisco	4	1.25	2006	0.8	4	4.33	5	1.2
IAA-IPB	38	0.21	1995	2.4	0.3	0.43	7.98	18.7
ABI	7	1.5	2003	0.9	0.5	0.59	10.5	17.8
Villgro	50	0.058	2003	6.3	0.045	0.066	2.93	44
MLSVCF	0	na	2006	0.0	150	162.47	0	0
TnsMz	400	na	1998	30.8	0.5	0.67	na	na
Timbali	140	0.03	2003	17.5	2.8	3.32	4.2	1.3
UIRI	0	0	2002	0	0.15	0.21	0	0

Notes:
na = not available
For ABI-ICRISAT, the range of average sales is US$1-2 million and the range of total sales is US$7-14 million. In the table we have approximated with the midpoint of the range estimates.

Chapter 8

Good Practices and Lessons Learned

8.1 Main Message

The main message of this assessment is that success of an agribusiness incubator, as measured by growth of sustainable and competitive agribusiness enterprises[16], as well as the cost-effectiveness of an agribusiness incubator, is the outcome of six main factors: (1) risk management; (2) value chain integration; (3) demonstration effects; (4) adaptive scaling up; (5) pro-active business orientation; and (6) incubation design basics, including charismatic, business-savvy leadership, effective incubatee selection criteria and selection processes, a governance structure that provides sufficient flexibility to adapt the business incubation business model and service offering, and intensive networking and strong partnerships with stakeholders affecting the success of the incubatees.

The following sections are focused on the first 5 success factors. The sixth factor – incubator design basics – is common to all incubators regardless of sector. A summary of good practice incubation design basics with specific references to agribusiness incubation is provided in APPENDIX 9. More information can be found at www.idisc.net

8.2 Risk Management

As discussed in section 4.1 agriculture is inherently risky. One of the core competencies of any agribusiness incubator is therefore its ability to help clients reduce the risk inherent to agricultural production and distribution[17]. The cases assessed in this study applied a combination of technology, institutional, and networking strategies to help their clients mitigate risks and increase their growth potential.

Technology-based strategies to reduce risks include seed technologies such as drought tolerant seeds (e.g. Developed at ICRISAT and commercialized by ABI-ICRISAT) or pest-resistant biotechnology innovations such as BT cotton. Institution-based strategies include franchising to ensure market and price (e.g. cut flowers in Timbali and berries in Fundación Jalisco). Networking-based strategies include improving access to finance and facilitation in obtaining licenses and permissions.

Agribusiness incubators and agribusinesses of course also incur other risks such as technology, market and management risks. In the case studies assessed for this report, it appeared that the most important of these was "management risk," the risk that the core management team within an incubatee does not possess the ability to drive a start-up business to success. Fundación Chile for example performs a forensic review on its incubatees who fail. When it analyzes the factors causing the incubatees to fail, it is not market, financial or technical risk, but rather management risk, which is the primary cause. Consequently, incubators should develop effective forms of early warning to detect management risk and to advise the incubatee accordingly. *info*Dev's experience indicates that mentorship can be one effective tactic for this purpose.

8.3 Value Chain Approach

It would appear that case study incubators which support agribusiness development within the framework of a value chain approach have a smaller impact on the sector overall than ones who develop agribusinesses without this framework.

16 Sustainable and competitive agro-based enterprises could be individual farm enterprises (like in Timbali), or small businesses (like in IAA-IPB), or medium enterprises (like in CENTEV), or medium-large enterprises (like in Fundación Chile).

17 Other types of rik management, common to all types of incubators are mentioned in the Design Basics, see APPENDIX 9.

The value chain paradigm offers a useful structure for framing agribusiness development efforts generally. Chains are anchored in farm level organizations and are typically market driven and market connected. Two of the biggest challenges in developing agribusinesses exist at the farm and market ends of the chain. Applying the supply chain paradigm forces incubators to deal with mission critical supply and demand issues. Their use, for example, compels holistic consideration of farm product quality and cost and at the same time of consumer preferences, retail channel considerations, inventory tracking and financing, and the willingness of buyers to pay.

In many developing countries the absence of farm-to-market chains is the primary obstacle inhibiting agribusiness takeoff. For example, information and management systems, which allow farm-to-market chains to operate efficiently, may not have been extensively implemented or are being used in ways that exclude local producers. In such cases, affiliating with or creating de novo new retail outlet chains makes good sense, as in the example of Villgro Stores. In other cases distribution channels for new high value products like berries, cheese and olives into the US and UK simply do not exist, in which case developing new chains de novo makes good strategic sense, as in Fundación Jalisco.

In still other situations, incubators use supply chain paradigms both as the basis for evaluating competitive advantage and the basis for identifying specific competitiveness-enhancing interventions, as is the case for both TnsMz and Fundación Chile. TnsMz always studies a new agribusiness sector by applying a supply chain paradigm before entering it. It tries to understand the relative costs for each link in the chain and comparative product quality parameters vis-à-vis competing alternatives. The incubator tries first to analyze the structure and organization of legacy supply chains before assessing the difficulty associated with strengthening them. TnsMz tries new business models through demonstration before undertaking broader investment and full sector reform. Typically these demonstrations entail increased end-to-end integration and farm-to-market control. The admonition here is simply to understand the supply chain facts before committing resources.

An example of failure to understand the full implications of the value chain approach is in the evolution of Rusni Distilleries. The company was the first incubatee of ABI-ICRISAT and proved to be a very successful collaboration of three parties: a dynamic entrepreneur who wanted to commercialize a technology to extract ethanol from sweet sorghum, the scientists at ICRISAT who had developed the technology and the management of the ABI-ICRISAT who facilitated the licensing, the business development plan, the access to credit, and the promotion of the enterprise. During its initial stages, the company was able with help of the incubator to mobilize resources and get the visibility that it deserved. Subsequently, the company ran into considerable financial difficulties due to a number of internal and external factors. Among the key factors was an unfavorable policy environment towards biofuels and the lack of a network of reliable suppliers of raw materials. Failure to take into account those factors explains a considerable part of the later difficulties of the company.

8.4 Demonstration Effects

Successful agribusiness incubators have a powerful demonstration effect: previously untried ventures become possible and a positive energy for change becomes diffused. Demonstrations are a powerful way to have more extensive impact above and beyond the immediate enterprises directly served by the incubator. It also helps the incubator establish a good reputation, which in turn attracts resources and partnerships. A few examples include:

- After distilling sweet sorghum juice into ethanol, ABI-ICRISAT opened the way to a cluster of biofuel producers;
- After introducing new rearing technique for salmon in Chile, Fundación Chile revolutionized the sector;
- After showing that a determined young woman could defy convention and reach relative wealth from scratch in Indonesia, other women will follow the example;
- After showing that poor women could be successful at becoming franchisees for the cut-flower industry in South Africa, Timbali incubator opened the way to the development of a sustainable and competitive value chain;
- High-tech entrepreneurs associated with CENTEV were encouraged by seeing success of

some entrepreneurs bringing an idea to the market and moving towards mid-size biotech companies.

8.5 Adaptive Scaling Up

Scaling up and replicability are the real test of the efficacy of the incubating approach to agribusiness development. The evidence shows adaptive replicability through the incubation of incubators. Fundación Chile spinoffs include: Fundación Jalisco, Fundación Sonora, and Fundación Perú. ABI-ICRISAT is currently incubating 10 incubators in India.

Due to the unique circumstances surrounding the birth of Fundación Chile, an exact duplication of the Chilean model in other countries is highly unlikely. Indeed, in recent years, a number of efforts have been launched to create entities that use elements of the Fundación Chile model to grow new agribusiness value chains. Among these are two based in Mexico: Fundación Jalisco (FJ) of Guadalajara, and Fundación Sonora (FS) of Hermosillo. Both cases are documented in APPENDIX 8.

ABI-ICRISAT has taken the leading role in establishing the Network of Indian Agribusiness Incubators (NIABI) and subsequently training during their initial phase, ten incubators belonging to national research centers and universities throughout India. The concept of "Co-Business Incubation" allows it to develop a strong network among incubators that ultimately will enhance the development of agribusiness enterprise and the contribution to agricultural development.

It is this need to maintain a dynamic competitive/cooperative relationship with other participants in their immediate agribusiness ecosystems, which further characterizes successful agribusiness incubators generally. Incubators need to be designed purposefully to change themselves over time, as well as the business ecosystems which they affect. Incubators such as ABI-ICRISAT, IAA-IPB, and Fundación Chile have been proactive in supporting or starting new incubators. Eventually these other incubators will be in competition with the original incubators (particularly if they work in the same country). The expanded opportunity set derived from cooperation with them, however, outweighs the disadvantages derived from increased competition in the provision of incubation services.

8.6 Pro-active Business Orientation

As discussed, agribusiness incubators are unique in the sense that their clients need a high level of basic and advanced support when it comes to business modeling and marketing initiatives. It is all too common for an SME client involved in agribusiness incubation not to have the basic business skills necessary to create a sustainable business entity. It is also too common for these clients not to have the contacts and resources necessary to make sound business decisions.

Because of this, it is critical for the agribusiness incubator manager to devote much effort to developing the network and resources necessary to serve the needs of the SME client. Services that the incubator cannot directly offer need to be addressed through the development of an extensive network of official public and private relationships. If the incubator does not have a financial loan program, the incubator manager must work with local finance institutions to make those loans a possibility. Whether it is financial services, agricultural inputs, basic business services, or laboratory analysis, the needs of the agribusiness SME client rarely change. They need customers, and to do that, they must be shown where the customers are, what standards they must adhere to, and what competitive advantages they can exploit. Competitive markets will vary greatly depending on the scope of the client, the resources at their disposal and the products themselves, but defining their business model is job one. In the absence of in-house services, agribusiness incubators must develop and maintain relationships with outside organizations in an effort to serve the needs of the client. These services can be categorized, generally speaking, as follows:

- Inputs (seeds, fertilizer, processing equipment, packaging)
- Finance (loans, lines of supplier credit)
- Laboratory Services (nutritional analysis, shelf life studies)

- Compliance (regulatory certifications, standards)
- Markets (identification, routes, distribution models)

Of course, the success and sustainability of the SME clients has a direct relationship to the success and sustainability of the incubator itself, so it is in the best interest of the agribusiness incubator to ensure proper market development on behalf of their clients. Simply put, "no customers means no business", and agribusiness SME clients are often ill informed when it comes to market development, standards and legal compliance, and the competitive landscape in which they must operate in order to achieve their goals. By offering SME clients the services they need throughout the value chain, agribusiness incubators can ensure the sustainable survival of their clients as well as the ability of the incubator to continue attracting quality SME clients to their services in this very competitive arena.

Chapter 9

Conclusions and Recommendations

This assessment supports the notion that agribusiness incubators provide a useful approach toward commercialization and modernization of agriculture, and the development of an indigenous agribusiness sector in developing countries. Agribusiness incubation can thus be thought of as a complement to other approaches that have been pursued over the past 3 decades including (i) strengthening farm organizations; (ii) promoting large scale agribusiness investment; and (iii) value chain development.

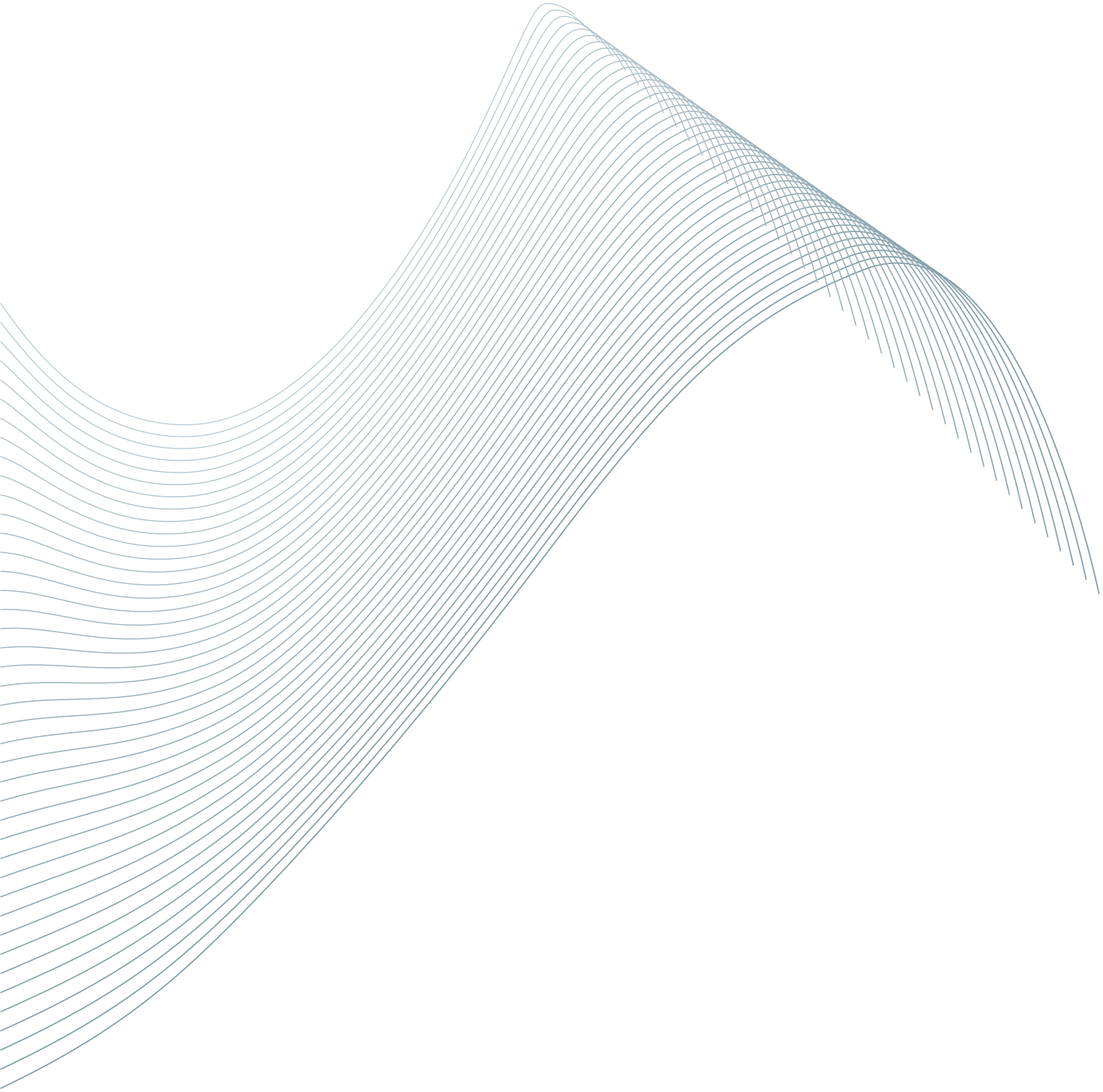
Agribusiness incubators share several aspects with each of these approaches. Agribusiness incubator managers deal with farmer organizations, provide integration along the value chain, often try to advance policies to improve the business environment, and sometimes work with large agribusiness enterprises. Their specificity consists in targeting innovative early-stage enterprises with a high-growth potential to become competitive businesses, and in the role they play as catalyzers or demonstrators of innovation and new firm entry, which ultimately stimulates competitiveness and growth.

The preliminary analysis in this report indicates that agribusiness incubators might be a cost-effective way to promote commercialization and modernization of agriculture, which is a fundamental avenue towards the structural transformation of the economies from primarily agriculture-based to primarily industry- and service-based. The structural transformation is accelerated through an increase in productivity in agriculture which is possible by increasing value added and developing competitive agribusiness enterprises; hence, agribusiness incubators might be an appropriate approach.

If the findings of this report are validated, then agribusiness incubators could represent a powerful tool for agricultural development. The tool has so far been relatively underinvested, particularly when compared to other approaches.

The main recommendations are:

- **Broader In-Depth Assessment of Agribusiness Incubators**. To pursue a more in-depth and broader assessment of agribusiness incubators in order to validate the conclusions of this report. Agribusiness incubators are a relatively recent innovation in developing countries. This study assessed the existing literature, as well as ten hand-picked cases; however, further analysis is recommended to gain a more in-depth understanding based on a larger sampling of cases, and a deeper analysis of the cost-benefits of an agribusiness incubation investment. The analysis should include examples of agribusiness incubators that have not been successful, and would require significant field research including extensive interviews with entrepreneurs, farmers, and other stakeholders.
- **Training and Capacity Building**. To further disseminate the knowledge on agribusiness incubators and provide capacity building and training opportunities for new agribusiness incubator managers. *info*Dev has taken leadership in initiating pilot training for agribusiness incubators based on the assessment of good practices. The demand for this type of training and information is quite high, since so far no other training has systematically benefited from the experience of other agribusiness incubators in developing countries.
- **Agribusiness Incubator Programs**. Promote agribusiness incubator programs, as opposed to agribusiness incubator projects. An agribusiness incubation program considers investment in agribusiness incubators as part of an overall effort towards agricultural commercialization and growth of sustainable and innovative agribusiness SMEs. Rather than seeing an agribusiness incubator project investment in isolation, it aims at establishing a network of agribusiness incubators integrated with other initiatives already occurring in the same countries, such as value chain development, farmer organization development, improvement of the business environment, promotion of SMEs, and promotion of innovations and technology.



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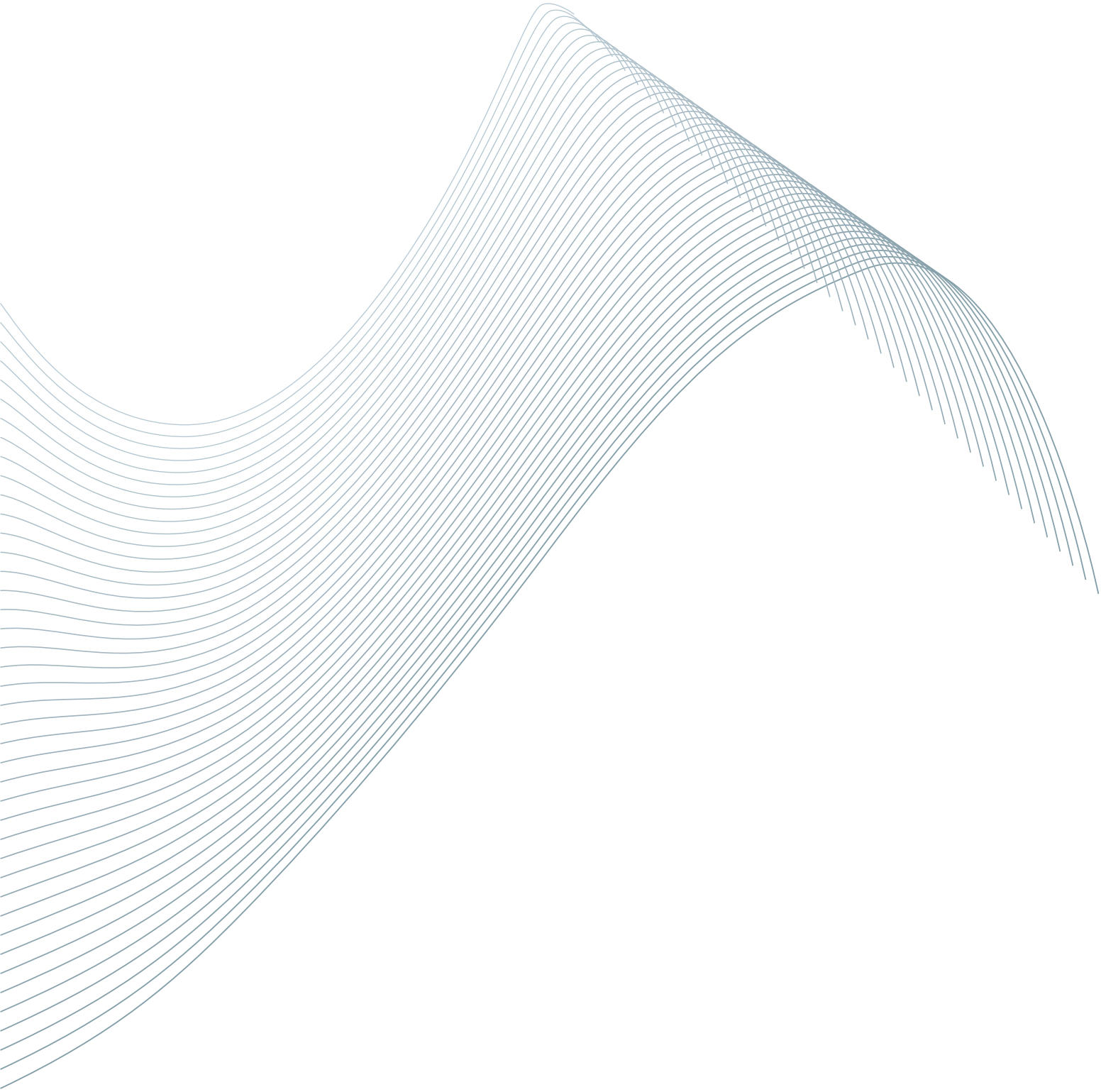
Appendices

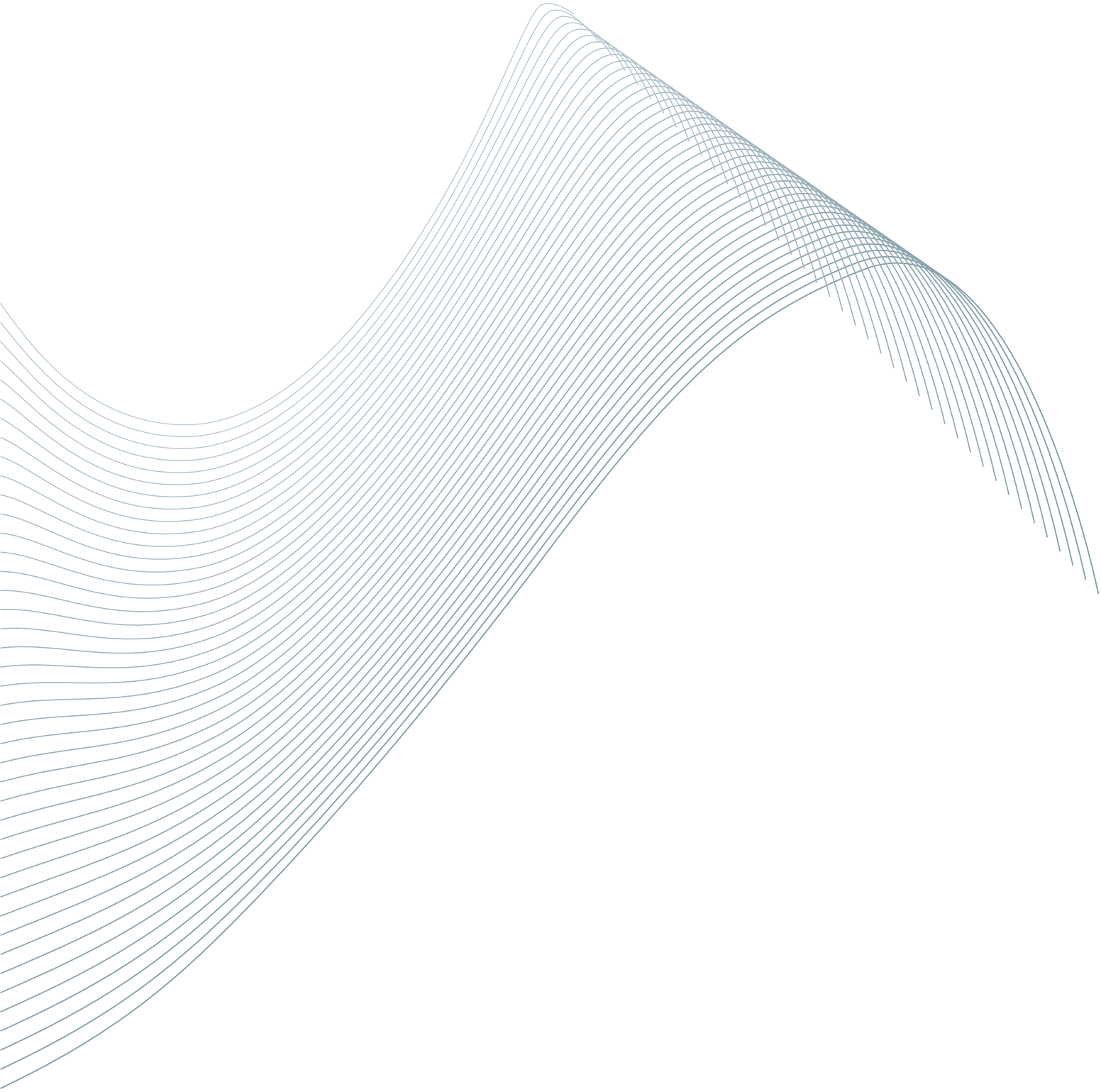


Appendix 1

Case Studies Missions

No.	Incubators/Business develoment organization	Country	Mission Dates
1.	Fundación Chile	Chile	31 Jan—4 Feb, 2011
2.	Technology Based Business Incubator, Fed. Univ. of Viçosa, CENTEV	Brazil	22 Feb—26 Feb, 2011
3.	Fundación Jalisco	Mexico	7 Feb—11 Feb, 2011
4.	IAA-IPB	Indonesia	13 Feb – 18 Feb, 2011
5.	Agribusiness Incubator-ABI, ICRISAT	India	24 Apr – 28 Apr, 2011
6.	Villgro	India	28 Oct – 3 Nov, 2011
7.	Malaysian Life Sciences Capital Fund, MLSCF	Malaysia	22 Mar – 30 Mar, 2011
8.	Timbali Industrial Incubator	South Africa	14 Feb – 18 Feb, 2011
9.	Technoserve of Mozambique	Mozambique	14 Mar – 21 Mar, 2011
10.	UDET	Uganda	7 Feb – 11 Feb, 2011
11.	UIRI	Uganda	7 Feb – 11 Feb, 2011
12.	Technoserve	Uganda	7 Feb – 11 Feb, 2011

Note: The case studies of UDET and Technoserve Uganda were conducted because initially thought as agribusiness incubators. The mission revealed them to be primiarly business development organizations and therefore they were dropped from the case studies relevant to the assessment of agribusiness incubators.



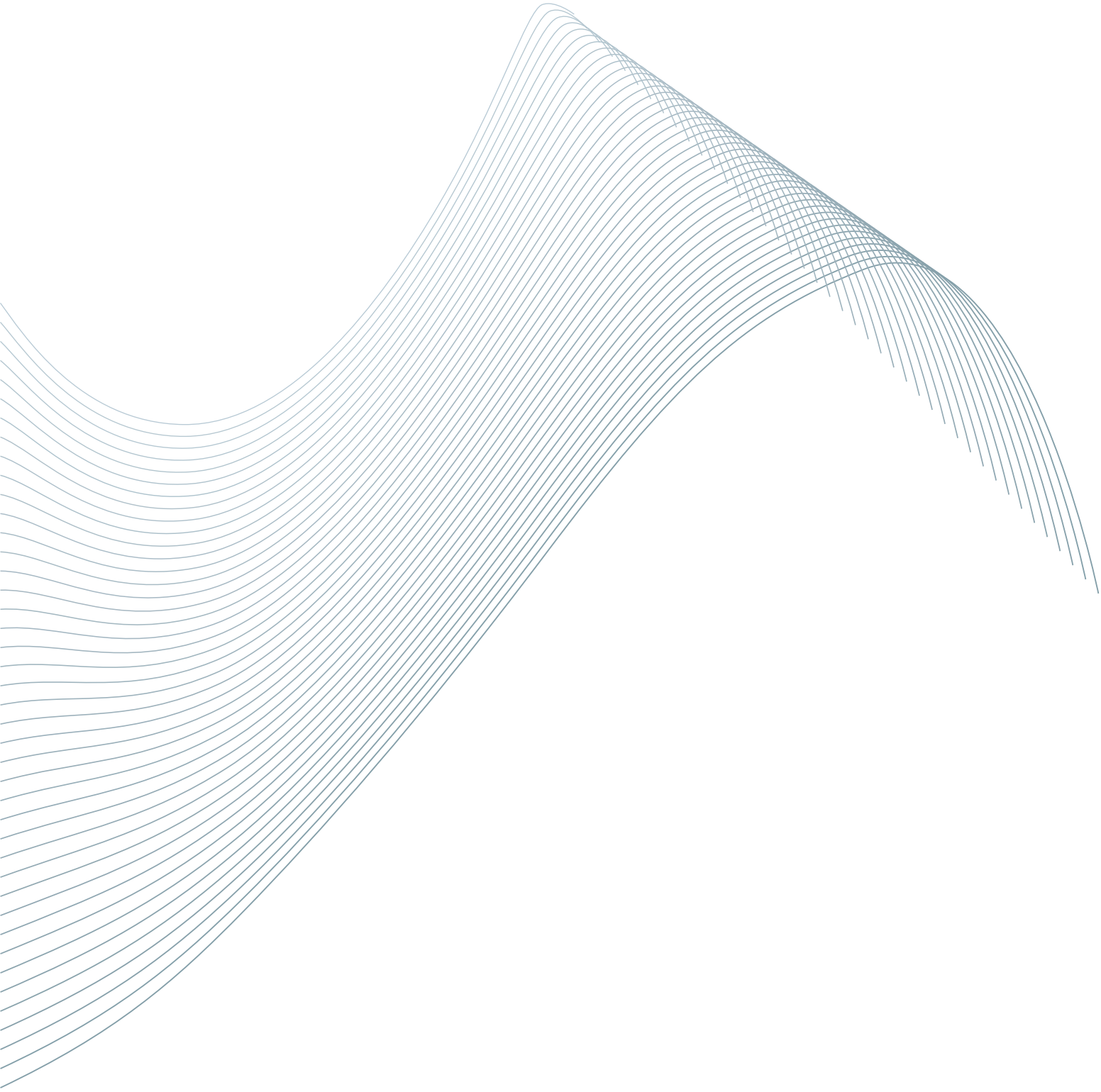
Appendix 2

Justification of Case Studies

Table 5 Agribusiness Incubator Case Studies – Justification for Inclusion and Model

No.	Name	Country	Starting Year	Justification for Inclusion in the Case Studies	Model
	ASIA				
1	Villgro	India	2002	Unique focus on improving rural livelihoods through commercialization and scaling of innovations	Technology Transfer – Low tech, domestic
2	ABI-ICRISAT	India	2002	Focus on commercializing state-of-the-art research on crops for semi-arid tropics and strong links with international center for agricultural research (ICRISAT)	Commercialization of Agricultural Research
3	IAA-IPB	Indonesia	1995	Focus on commercializing agricultural research on agricultural inputs, processes and machinery, and strong linkages with agricultural university and cluster of research centers in a region of Indonesia (West Java)	Commercialization of Agricultural Research
4	Malaysian Life Sciences Capital Fund (MLSCF)	Malaysia	2006	Focus on international high tech transfer. Based on a venture capital investment approach combined with technical assistance	Technology Transfer – High tech, International
	AFRICA				
5	Timbali Technology Incubator	South Africa	2002	Focus on improving the livelihoods of disadvantaged smallholder farmers through a market-based approach	Agribusiness Value Chain/Sector Development
6	UIRI	Uganda	2002	Focus on commercializing research on agricultural inputs, processes and machinery	Commercialization of Agricultural Research
7	Technoserve		1998	Focus on strengthening/reviving selected agricultural value chains	Agribusiness Value Chain/Sector Development
	LATIN AMERICA				
8	Fundación Chile	Chile	1976	Focus on pro-actively identifying market opportunities and stimulating new agricultural sub-sectors	Agribusiness Value Chain/Sector Development
9	Fundación Jalisco	Mexico	2004	Focus on pro-actively identifying market opportunities and stimulating new agricultural sub-sectors	Agribusiness Value Chain/Sector Development
10	Fed. Univ. of Viçosa, CENTEV	Brazil	1998	Focus on commercializing agricultural research on agricultural inputs, processes, and machinery	Commercialization of Agricultural Research

Source: Authors
Note: The primary criteria for selecting these case studies were a) location in a developing country, b) the number of years in operation, c) a demonstrated track record, d) spread in geographic location and type of incubator



Appendix 3

Methodology

The project team has developed a set of interview guidelines which are intended to identify and to assess "good practices". The interview guides include requests for quantitative metrics which measure incubator effectiveness, outputs, outcomes and input/output cost benefit ratios. Several approaches have been used to indentify "good practices" with which high performance should be correlated. In the first instance "good practices" need to be self-proclaimed and self-identified through the questionnaire. Further exploration with incubator managements and further testing with 3 or more incubator graduates have helped us to identify aspects of agro-incubator management practice which are unique and which are uniquely valuable from the perspective of characterizing methods and strategies which other, start up agro-business incubators can usefully emulate and profit from. Interviewing successful incubatees has provided context and informed opinion about what specific incubators do well and what they either failed to do from which incubatees would have benefited, or did poorly.

CHEKLIST GUIDELINE FOR INTERVIEWS

History of the Incubator

- When and where was the incubator founded?
- Why was it founded?
- Does it have a subordinate or subsidiary relationship with another institution or organization? If so, explain.
- What was the incubator's original legal status? What is its current legal status?
- What changes took place subsequent to start up in the incubator's mission, organization, funding or legal status?
- What set of events did lead to its initial start-up?
- What subsequent set of events took place, which most significantly influence its current mission, form or function?
- What does the incubator do well? What does it not do as well as it might? What progress has been made in correcting this situation over time?
- What lessons were learned from its start-up and subsequent strategic inflection, which may have relevance to other emerging incubators?

Geographic Domain

- Describe the economic/business context in which the incubator operates, e.g. business density, population, third party service reliability, infrastructure quality, etc.
- What does the incubator consider to be its primary service domain? What is its secondary service domain? Who are its primary customers or stakeholders?
- Within what geographic boundaries does it operate?
- What set of constraints limit or define the incubator's primary service domain?
- Is it the incubator's strategic objective to remove these constraints in the future? If so, how?
- Where is incubator's headquarters or its primary business located? What facilities exist at this location?
- Where else does the incubator have business offices?

Ancillary Business Support Services

- Does the incubator have a permanent banking relationship? If so, with which commercial bank do you deal? What size of credit line does this bank hold open for the incubator?
- Does the incubator have an outside auditor? If so, what services does that auditor provide?
- Does the incubator retain the service of legal counsel? If so what litigation or what legal disputes are pending?
- What other business support services does the incubator retain? Explain.

Complementary and/or Supplementary Relationships with Academic and Public Sector Programs

- Do any of the services, which the incubator offers complement or supplement similar

services offered by branches of government or academic institutions? Explain.
- Describe the relationship, which the incubator maintains with government sponsored agricultural extension services, agricultural research foundations, technical schools or universities and explain how these relationships have changed over time.
- Do weaknesses exist in the governments own systems of technical or service support to farmers (e.g. agricultural extension), which the private sector needs to supplement?
- Are the incubator's programs purposefully designed to fill gaps or to strengthen weak links in the government service system?

Strategic Vision

- Do all stakeholders know the incubator's strategic vision?
- How does the incubator's management communicate that vision to them?
- What is your incubator's mission statement?
- How has the incubator's strategic vision changed over the past 5 years?
- What caused it to change?
- What would management expect the incubator to become in 5 years? In 10 years?
- What four key actions are required to realize this future vision?

Unique and Distinguishing Attributes

- What four aspects of the incubator's mission, core competencies, service delivery systems or network relationships most distinguish it from other business incubators?
- What are the incubators four primary strengths?
- What are its primary weaknesses?
- How does management propose to augment its existing strengths and overcome its weaknesses?
- What lessons can be taken away from the way in which the incubator has built up its strengths or compensated for its weaknesses since its founding, which might have value to other emerging incubators?

Management Team

- Who are the core members of the management team and what are their business backgrounds and training?
- How would you describe (in your own words) the management style of the core team?
- What are the primary competencies contained within the management team?
- What are the primary weaknesses of the team?
- How did the management team come together?
- How long has the team worked together?
- What lessons can be learned from your experience about management team recruitment, team cohesion and team building, which may have relevance to other incubators?
- Do core members have food production experience?
- Does core management have local, regional and/or international marketing experience?
- What is the staff to client ratio? How many staff do you have? What are their profiles and what services do they provide?

Leadership

- How important is strong leadership to the incubators success? Does the incubator have enough leadership? Do you have too many or too few leaders within your incubator?
- In your own words how would you describe leadership within the incubator (top-down, bottom-up, sideways, clear and un-ambivalent, changeable based on circumstances, noisy and sometimes unclear, etc.)?
- How does the incubator go about developing leadership among its incubatees?
- What lessons can be learned from your experience in developing both internal and external (among incubatees) leadership, which may have relevance to emerging incubators?

Modes of Governance and of Management Oversight

- What mechanisms or controls work to assure that the Incubator uses the resources under its management's control for maximum impact in terms of generating competitive enterprises?
- What powers of oversight are vested in a board of directors or oversight panel? Does the board include representatives of public, private, financial and academic institutions?
- On what basis is the compensation of the CEO of the incubator determined? On what basis can the CEO be dismissed? Has this ever happened?
- What is the background or qualifications of board members (e.g. private, public, academic, finance)?
- Do any management personnel have financial interests in private agribusiness enterprises?

Start up Funding

- What was the incubator's original funding source?
- What conditions/requirements did the original funding source impose on your incubator?
- What subsequent funding was the incubator able to secure?
- How did it go about securing this funding?
- What lessons can be learned from your experience with fundraising, which might have relevance to other incubators?
- What works best and what does not seem to work in this area of fundraising?

Sources and Uses of Funds in an Ongoing Operating Mode

- What is the business model of the incubator?
- In addition to external (donor or government funding) what other external or internal sources of funding support your incubator's operations?
- What service fees does your incubator impose on incubatees? How do you go about pricing these services?
- What are the primary sources and uses of cash for each of the past 3 years? Which sources/uses are increasing and which are declining? What proportion is earned and what proportion is comprised of subsidies? When did you reach/anticipate to reach break-even? If financial sustainability (defined as covering your operating expenses through earned revenues) is not a goal, please explain why. Discuss.
- What lessons can be learned from your fundraising experience, which may have relevance to other emerging incubators?

Selection of Incubatees

- On what basis do you find your incubatees? How many apply annually? How many have you selected per year for the past 3 years?
- Do you have different classes of incubatees and if so do you recruit them from different sources and in different ways? Explain
- Do you apply formal criteria to the final selection of incubatees? If so what are they and how often do you reapply them in an effort to weed out non-performers?
- What lessons again can you take away from your experience with the selection of incubatees, which may have relevance to emerging incubators?
- How many incubatees do you serve at any given time?

Graduation of Incubatees

- How many incubatees have you graduated in total?
- On what basis do you graduate your incubatees? How many have you graduated per year for the past 3 years? What has been the average age of a graduate when they separate from the incubator for each year over the past 3?
- Do you have different classes of incubator graduates and if so on what basis are they caused to leave the incubator? Explain.
- Do you apply formal criteria to the selection of incubatees for graduation? If so what are these criteria? What is generally the annual turnover of the enterprises at the start of the incubation process? What is it generally at graduation? How many employees do the incubatees generally have at the start of the incubation process? How many do they generally have upon completing the incubation process?
- What are the export earnings of the graduated companies? What investments have been attracted?
- What lessons again can you take away from your experience with the graduation of incubatees, which may have relevance to emerging incubators?
- What is the average time frame for companies to graduate?
- What role does the incubator play in establishing business linkages for incubated companies?

Success and Failure of Graduates

- What percent of your graduates are still in business 2 years after graduation?
- What is the average revenue generated per incubatee per year, 3-5 years after graduation? How many new jobs does each graduate generate 3-5 years after graduation?
- What factors most determine the business success or failure of graduates?
- What lessons have you learned about how best to assure graduate success?

Services Offered Incubatees

- What core services do you offer to your incubatees? How did you identify these? How do you charge for them?
- What non-core or optional services do you offer?
- Has this service mix changed over time? If so, why?
- What lessons have you learned about the value of various services, their offer on a pro bono or

fee for service basis and their offer as part of a standard package or on an a la carte basis from a menu?
- Does the incubator help incubatees identify appropriate technologies to enhance the quality and/or volume of the product offering? If so, how?
- Does the incubator help incubatees with export promotion? Sourcing from abroad. How? Examples?
- Does the incubator help with meeting standards, ensuring quality?
- Does the incubator offer incubatees to market under the incubator brand?
- Does the incubator offer physical facilities for incubatees? If so, describe.
- Does the incubator offer facilities for testing, production, warehousing and shipping? If these services are provided what is the modus operandus?
- What research tools does the incubator offer for incubatees to examine business opportunities?
- How are the incubatees financed? What size financing do they normally require?
- What do you see as the top 2-3 challenges for your incubatees?

Capital Assets and Facilities

- What core fixed assets are owned by the incubator and used for its delivery of services to incubatees?
- What non-core fixed asset are owed by the incubator and not used to support its delivery of services to incubatees?
- What is the original cost basis for all fixed assets, land and facilities owned by the incubator?
- What has been your annual capital or fixed asset budget per year for the past 3 years?
- Is it easier for your incubator to raise capital to invest in fixed assets as contrasted with providing for expanded operations and additional operating expenses?
- What fixed assets do you want to add to your portfolio in order to improve your ability to support your incubatees?
- What lessons have you learned about facilities management and investment in fixed assets?

Cost of Services Provided

- What is your variable cost per incubatee per year?
- Is the average cost of supporting an incubatee rising or falling over time? Why?
- How does your unit cost compare with that of other agro-business incubators? What is the reason for this difference, if one exists?
- What lessons have you learned about cost control, which might be of value to emerging incubators?

Networks and Partnerships

- What are the four most important network relationships or partnerships to the success of your incubator?
- What specialized competencies do each of your four most important network partners bring to their association with your incubator?
- Which competencies do you choose to in-source? Which competencies do you choose to out-source? What is the basis for this inside/outside division of responsibility?
- How do you determine when a networked partnership is productive and useful? How do you determine when it is not?
- What strategy do you use when choosing network partners? What balance do you try to maintain between cooperation and competition when choosing or retaining partnerships?
- What lessons have you learned concerning the development of strategic partnerships, which might benefit emerging incubators?
- What involvement does the incubator have in the formation or strengthening of related organizations, particularly agricultural cooperatives or other members of the value chain?
- Does the incubator assist companies in supply negotiations for supportive services, including shipping quotes, packaging supplies, processing equipment or financing?

19. Results: Outcomes and Outputs

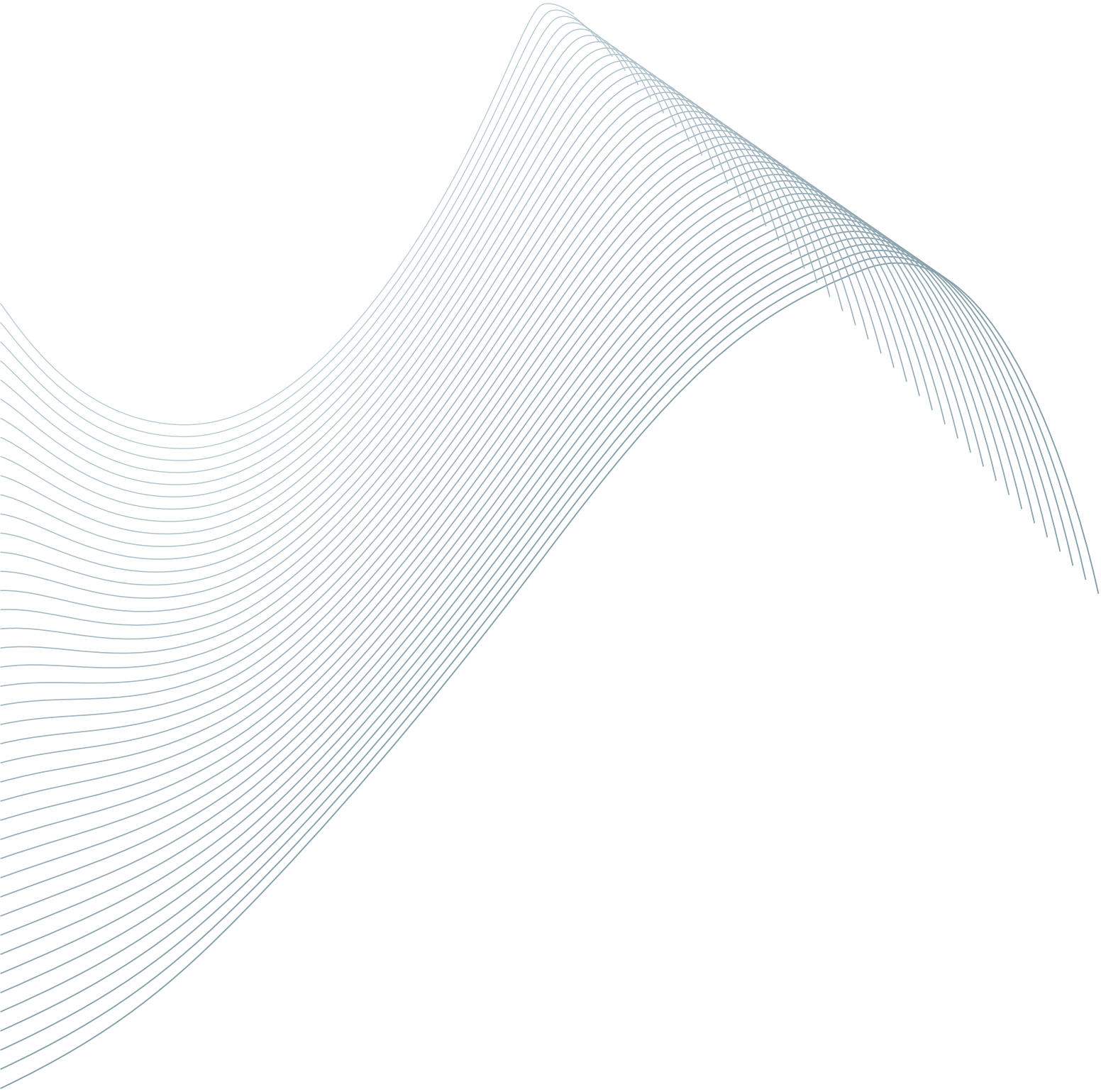
- How do you measure the results of your incubation work? What are appropriate metrics?
- On the basis of these metrics has your incubator been able to realize good value for money over the past 3 years?
- How many new jobs have the incubatees created per year during this period? What kind of jobs? (high skill/low skill, full-time/seasonal)
- How many new businesses have you helped to start up? To accelerate?
- What effect have you had on farmer's incomes and/or on their wealth over the same period?
- Have you been able to affect any changes in policy/government programs? Academic offerings? Financial offerings? The societal

perception of business and entrepreneurship? Please explain and offer examples.

- What lessons have you learned about maximizing value realized for expenses incurred which might have relevance to start up incubators?

Post Graduate Affiliation

- Do graduates continue to be associated with the incubator even after they graduate? Have they formed any informal or formal business associations to help themselves and fellow graduates? Explain.
- Have graduates attempted to go further and to associate with one another through clusters, mergers, shared distribution channels or supply chains? Explain.
- What lessons can be learned from you experience in managing post graduate incubatees and continuing to associate with them which may have relevance to new incubators?



Appendix 4

Overview of The Case Studies

Table 6 General Features of 12 Case Studies

Incubator	Objective	Value Chain Segment	Target Clients	Founding	Results	Service Offering	Business Model
1. Fundación Chile, Santiago, Chile	To increase the competitiveness by promoting and developing high impact innovations, technology transfer and management for the country To serve as the country's leading technological institution, for the creation and dissemination of innovative businesses that have a high impact on the institution's target sectors	Fundación Chile began with development of agribusiness chains ranging from vegetables and fruits, berries, and wine, to salmon and other aquaculture, beef, forestry, and today is also involved in biotech, IT, environmental technologies, and other advanced services Fundación Chile supports the start-up and growth of enterprises that commercialize new products and technologies in new value chains	Fundación Chile supports development of entire value chains with co-investments in pioneer companies and strategic investments in gaps in value chains Clients range from entrepreneurs to farmers. Targets both early-stage entrepreneurs and more mature enterprises that aim at the next stage of growth	1976 US$50 million in start-up capital Jointly founded by the Government of Chile and IT&T Corporation (USA)	Helped to create more than 85 companies Has created an estimated US$1.3 billion in social benefits for Chile (1976-2005) Has contributed to the commercialization of more than 15 value chains	1. Provides technology transfer services, business plan development, market studies and strategies, and access to finance 2. Co-invests in pioneer agribusiness and industry ventures 3. Brokers technical knowledge from businesses and world markets to the needs of the Chilean industries, companies, and start-up companies 4. Links entrepreneurs, companies, and farmers to government programs	Operating costs estimated at an average of approximately US$40 million per year Operations funding (average): 30% technology sales, 40% contributions to R&D, 12% contract research with gov't agencies, 6% gov't performance agreement, 15% other sources (dividends, capital gains, own capital) Fundación Chile revenues are 85% earned versus non-earned revenues

Incubator	Objective	Value Chain Segment	Target Clients	Founding	Results	Service Offering	Business Model
2. CENTEV/UFV Technology Incubator, Federal University of Viçosa, Viçosa,, Brazil	Facilitate the creation and development of new, technology-based businesses and promote the diffusion of entrepreneurial culture and innovative technologies coming from the academic community, contributing to local development	Broad focus on incubating value added companies in agribusiness, biotech, IT and other technology companies	Incubator primarily assists university researchers and students start-up zero-stage enterprises	1996 US$0.7 million in start-up capital Founded by the Federal University of Vicosa	Outcomes: 24 companies have graduated with median sales of US$2.5 million per year Estimated aggregated sales revenue of US$40 million and 100 jobs created Commercialization of technologies in agribusiness, food engineering, biotechnology, forest management	Incubator provides a full range of pre-incubation and incubation services: Provides specific guidance for the design, implementation and consolidation of enterprises High quality business training of entrepreneurs how to manage their businesses	Estimated Annual budget: US$400,000 Operations funded principally by fees, grants and fellowships from state agencies, and university support
3. Fundación Jalisco de Innovación y Desarrollo, A.C., [Jalisco Foundation for Innovation and Development, Inc.], Guadalajara, Mexico	Generation and distribution of wealth by developing and managing agribusiness technology transfer projects that facilitate access to innovation, detecting business opportunities, and linking all the necessary stakeholders	Fundación Jalisco focused on enabling the development of entire value chains, including start-up and growth of enterprises that provide inputs to primary agriculture as well as enterprises that add value and market agricultural products. Principal value chain segments include: blueberries, cheese, and olive oil.	Incubator supporting 200 farmers to grow blueberries, helped start-up blueberry nursery, facilitated investment attraction of major blueberry distributor to the region.	Fundación Jalisco founded in 2006 Estimated US$4 million of start-up capital Founded by private sector investors and the state government of Jalisco	Outcomes: 200+ farmers now grow 300 hectares of blueberries, goal is 800 farmers producing 3500 ha. by 2015 4 companies have graduated (blueberry nursery, berry commercializaton company, olive oil production company, gourmet cheese company) Estimated aggregated sales revenue of US$5 million and 400 jobs created Blueberry growing technologies commercialized	Provides training, technical assistance, and access to finance for farmers regarding production of new high value crops Brokers technical knowledge to the needs of the Jalisco's agricultural sector Promotes and co-invests in pioneer agribusiness ventures Links the stakeholders of high value agricultural value chains	Annual budget estimated at US$400,000 Incubator funded by fees, equity, investors Relative percentage of earned versus non-earned revenues is 45%

Incubator	Objective	Value Chain Segment	Target Clients	Founding	Results	Service Offering	Business Model
4. Incubator for Agroindustry and Agribusiness– Bogor Agriculture University (IAA-IPB), Bogor, Indonesia	Providing incubation services to help the growth of start-up small scale enterprises in agribusiness and agroindustry into strong and independent enterprises ready to scale up to medium scale	Cover different agribusiness value chains (e.g. fresh vegetables, essential oils, juices, honey) and more recently 30% of its incubatees will be from IT, Leather, and Handicrafts	Start-up entrepreneurs or SMEs with 1-3 years experience. Focus on graduates of the university and entrepreneurs in West Java	1995. An initial grant of US$100,000 from the Ministry of SMEs provided seed money for 10 incubatees. Since 2000 the incubator is self-sufficient financing its operational expenses with rents, fees, profit sharing	The incubator has helped to start-up an accumulated number of 77 new businesses, of which 27 are still under incubation and 38 have graduated, and 12 withdrawn Over past 3 years, agroindustry and agribusiness enterprises had sale growth of over 20% comparing favorably with the average growth of 18% over different sectors In terms of average size, agribusiness enterprises are relatively small with sales less than US$100,0000 per year and IT and agroindustry are larger size (US$900,000 and US$250,000) Farmers income increased through higher unit prices for supplying raw material and higher volumes Impact on developing academic curricula for entrepreneurship. Impact on policy formulation of incubation strategy	1. Office space and utilities for resident incubatees, at a very moderate rental cost 2. Other office facilities, such as meeting and training rooms at no charge 3. Free consultation for technology development, management improvement, and marketing plan 4. Free training, business meetings, and workshops 5. Access to processing plant and labs, with moderate charge on service basis 6. Free consultation for writing business plans required in credit application 7. Facilitation in credit application. In particular, the incubator helps incubatees in looking for specific credit schemes with low interest from government programs. Size of this finance varies according to the type of business, but most incubatees have been able to get loans of at least Rp 100 million (about US$11,000)	University and Research Based Their operational budget is about US$10,000 per year. IAA-IPB has 5 full-time staff members.Management successful in ensuring coverage of operational expenses since 2000. Over past 3 years able to raise funds for investment in new facilities and equipment to allow expansion of number of resident incubatees. Future directions include: 1. Lobbying policymakers to guide the regional government in supporting the incubator 2. Strengthening the capacity of the assistant managers who are full time staff 3. Starting implementing policy to draw more contribution from the incubatees since the initial incubation period 4. Strengthen postgraduate program 5. Expand the focus beyond agribusiness

Incubator	Objective	Value Chain Segment	Target Clients	Founding	Results	Service Offering	Business Model
5. Agribusiness Incubator—ICRISAT, Hydebarad, India	To facilitate the creation of competitive agribusiness enterprises through technology development and commercialization	ABI will promote ventures directly through its service strategy. The identified new strategic services of ABI are in the area of ■ Seed Ventures ■ Biofuel ventures ■ Innovative ventures ■ Farm ventures and ■ Agri-biotech ventures	SMEs, farm entrepreneurs, innovative SMEs, innovative biotech start-up, and start-up incubators in the Network of Indian Agribusiness Incubators	2002 with an initial funding of US$0.5 million from Government of India	40,000 farm beneficiaries ■ 4000 acres were brought under Sweet Sorghum cultivation ■ 1500 farmers are benefited from cultivating ICGV91114 groundnut variety over 5000 acres ■ JG 11 chick pea is being grown by 20,000 farmers covering around 100,000 acres ■ Bajarangi Bt was commercialized by ABI. Around 525,000 packets of Bajarangi Bt cotton seeds were sold during the last 2 years benefiting 200,000 farmers and covering 500,000 acres Impact on Society ■ Entrepreneurs trained: 656 ■ Ventures incubated: 156 ■ Investment mobilized for ventures : US$16.3 million ■ Employment generated (direct): 832 ■ Products introduced in the market : 64	Business consultancy Technology consultancy Business development Networking Capacity Building Infrastructure facilities Access to laboratories and experimental fields	<u>Mostly in the past: FRANCHISE / REVENUE GEN. MODEL</u> ■ Incremental technologies/ pure services ■ Type of incubatees: Numerous small businesses/entrepreneurs ■ Characteristics: ■ Needs significant ABI mgmt. support ■ Does not need great new tech inputs ■ Needs investment in technology transfer ■ Needs investment in branding / marketing ■ Service / royalties / one time fees <u>Aimed to in the future: CAPITAL GAINS MODEL</u> ■ Big impact highly proprietary technologies ■ Types of incubatees ■ Mature/ large businesses ■ Start-ups with solid entrepreneurs ■ Characteristics: ■ Needs less ABI mgmt support ■ Needs great new tech development support from ICRISAT ■ Equity payment primarily Annual budget US$223,000

Incubator	Objective	Value Chain Segment	Target Clients	Founding	Results	Service Offering	Business Model
6. Villgro Innovations Foundation, Chennai, India	Create wealth for rural households in India through innovation	The incubator focuses on zero stage enterprises, which supply productivity enhancing farm tools and inputs, consumer products and new services to poor rural households. The incubator operates its own rural retail network, which delivers many of the products/services, which its clients develop	The incubator assists zero stage enterprises, which are owned by early stage entrepreneurs many coming from rural areas	The incubator was founded in 2001 with a start up grant from the Lemelson Foundation. Its founder is a charismatic social entrepreneur	Outcomes: It has assisted more than 50 client companies in starting up It has commercialized 1500 new products, sold innovative products to more than 350,000 rural households and realized net social benefits of US$5 million plus	The key services which the incubator provides are mentoring, business plan development, product market testing, product testing of technical feasibility, distribution channel development, entrepreneur/ product innovator match making, investor/ entrepreneur matchmaking	Its current annual budget is Rs 88 million. Approximately 85 % of this funding comes from donors Approximately 3% of revenues are earned, from fees and other sources
7. Malaysian Life Sciences Capital Fund, Kuala Lumpur, Malaysia	Create an advanced biotech sector in Malaysia by transferring advanced technology across borders and by starting up local bio tech companies	The incubator is focused on enabling the start-up and growth of first stage high tech enterprises, which provide tools and products to agricultural value chains, health care providers and producers of food products	The incubator assists zero and first stage enterprises that possess IP to advanced technologies	The incubator was founded in 2006 with a US$ 150 million of committed capital primarily from the pension funds of several state owned enterprises The founders were a Californian VC and a Malaysian state owned technology development agency	Outcomes: Two local companies have been invested. Ten additional foreign companies have been invested and some limited degree of tech transfer has taken place It is too early in the life of MLSCF to assess results	The services that the incubator provides are typical VC services, including mentoring, oversight, and matchmaking with other tech companies and outside investors	The incubator's management budget is approximately 2-2.5 % of its investment base or about US$ 3 million A set of parastatal investors provide the funds capital base

Incubator	Objective	Value Chain Segment	Target Clients	Founding	Results	Service Offering	Business Model
8. Technoserve of Mozambique, Maputo, Mozambique	Increase the competitiveness and productivity of entire agribusiness sectors	The incubator is focused on enabling the start-up and growth of enterprises along entire value chains, including farms	The incubator assists relatively mature enterprises that aim at the next stage of growth and which their their own development efforts pull up other enterprises in the chain	The incubator was founded in 1998 A US$500K four year grant from USAID assisted the incubator to get started	Outcomes: Several entire agribusiness sectors have been strengthened, including poultry, cashew, banana, lentils, soybeans. Approximately 400 companies have graduated and each of these affects the livelihoods of 50-100 farms	Over the course of a series of 3-6 year sector engagements, the incubator provides strategic advice regarding processing, faming, packaging, transport/logistics, contract and other modes for interacting with farmers and marketing services. It also provides grants and soft loans, though agribusinesses to farmers	Its annual budget is US$ 7-8 million The incubator has been funded by 5 different donors over its 12 year its life Donor contributions account for 98% of its funding
9. Timbali Technology Incubator, Nelspruit, South Africa	To establish and support an enabling environment to promote predominantly broad-based Black Empowerment (BEE) agribusi-ness and related enterprises.	Timbali primarily provides technical training and both physical and virtual incubation to individual SME clients. They also feed their existing value chain of value-added, cut flower products under the incubator's own brand, AMABLOM	Primarily, Timbali targets zero or early stage SMES. Often, clients begin incubation with limited experience and personal resources	Timbali was founded in 2003, and has been funded with two grants totaling R20,000,000 (about US$ 3 million)by the South African Department of Trade & Industry's Small Enterprise Development Agency (SEDA)	Timbali has approximately one hundred and forty clients in physical incubation at any given time. There are also more than two hundred farmers in virtual incubation	Timbali offers physical incubation space to a number of companies, as well as off-site "virtual" incubation for others. Services include technical expertise, relationship development, market development, etc.	Timbali spends approximately R80,000 on each client for four years of incubation. Timbali also collects "levies" from each client to cover administrative and collective utility charges. Their annual budget is US$332,235. Timbali has nine full time staff members
10. Uganda Industrial Research Institute (UIRI), Kampala, Uganda	To be the model institution and regional center of excellence for incubation of industry and pioneering industrial research and development activities that could elevate the level of technology in Uganda and the region	UIRI provides business develop-ment and incubation services to small-scale SME clients, as well as a few larger-scale SMES. Additionally, they work at the grass-roots level via each of their rural training centers	UIRI primarily works with early-stage SMES at varying levels of capacity, in their physical incubation center. For the four, rural training centers, the work is done two fold – with both SME micro-farmers and the organizations that operate on their behalf	UIRI was founded in 2002 by the Parliament of Uganda, under the auspices of the Ministry of Tourism, Trade & Industry (MTTI). Funding has esca-lated from USH300,000,000 (US$150,000 at the time) to over USH 13,000,000,000 (about US$5million)	To date, UIRI has never "graduated" an SME client, due primarily to financing and market development shortfalls. At present, there are fifteen SME clients in physical incubation, not including individual farmers utilizing the four regional training centers (well over 1,000)	Physical incubation facility offers business development services, physical production space, mentoring, laboratory analysis, etc. Off-site training centers offer technical knowledge transfer, input assistance and processing facilities	The annual budget, at present, is USH 13,000,000,000 (about US$5 million), which is entirely government funded. No other funds are collected at present. UIRI currently has one hundred and sixty full-time staff members

Appendix 5

Internationalization

In most developing countries agribusiness incubators operate in lieu of missing markets to link rural and urban economies. In this capacity, they serve as membranes which evaluate, identify, select and pass through information which has significant commercial value in under developed rural economies including information which affects technologies, unsatisfied food market needs, and best farm management methods. This market surrogate function is critically important for farmers and SMEs in developing countries, many of who have no other access to opportunities, which reside in or emerge from urban spaces. Where efficient markets are missing, agribusiness incubators provide a useful and sometime the only conduit for linking rural and urban economies; agribusiness incubators have the advantage for prospective clients of being at the same time value seeking and non-rent taking.

All of the successful agribusiness incubators surveyed in this volume perform the function of building commercial bridges between rural and urban economies within their own national economies. Different incubators operate in various ways and they assume a variety of forms to perform this linking function. However, what they all have in common is their ability to build commercial bridges between rural spaces within their respective national economies and urban spaces within these same economies.

Fewer agribusiness incubators, however, perform the same function across national borders. The challenges are greater and the needs to build such bridges are less immediately pressing for rural development. With that said, some incubators have focused on the need to and the benefit to be realized from developing cross border linkages with providers of technology, potential supply chain partners and niche markets which afford opportunities to increase greatly the revenue base of local incubatees.

These exceptions include most notably incubators sponsored by international technology development and dissemination agencies like ABI-ICRISAT and other incubators which have matured through several stages of development like Fundación Chile and which have learned through their maturation that the value of technologies, unique high value product formulations, new business methods and models and other strategic elements of domestic agribusiness development can be leveraged up and competitively enhanced through cross border exchanges. When these exchanges are made a systematic and routine part of the incubation process, local companies gain from an international purview and a confidence that is based on broad international exposure.

To this end, both ABI-ICRISAT and Fundación Chile have recently taken actions to extend their reach in the form of affiliated/subsidiary incubators in parts of the world other than their home base. Thus, ABI-ICRISAT has announced plans to develop a network of agribusiness incubators in Sub Saharan Africa modeled on the Agribusiness Incubator of India. These African incubators will be closely aligned with ABI-ICRISAT regional research centers based in Africa whose dry weather agronomic technology they will endeavor to commercialize. They will operate in ways similar to the Agribusiness Incubator of India, e.g. they will transfer technologies from ICRISAT labs to local agribusinesses and will facilitate the development of enterprises closely related to dry agriculture technology use, technology dissemination and new food market development. In addition, however, they will operate as conduits for the transfer of technologies among the ABI-ICRISAT affiliated incubators, the cross selling of products among incubatees and the reciprocal prospecting and opening of new South-South markets with/through the Agribusiness Incubator of India as well as with/through each other.

Fundación Chile has responded to the challenge of internationalization in a different way. It has developed its own subsidiary company based in the

US which operates as a listening post, a set of early warning eyes and ears whose function is to identify emergent trends in international food markets and to identify emergent technologies with productive application for its incubatees. The subsidiary also operates as a commercial agent of Fundación Chile's incubatees in buying and selling the rights to new technologies and in introducing new agricultural products to US based buyers. After extensive analysis and based, as well, on its own extensive experience Fundación Chile determined that the potential benefits derived from building stronger linkages between the Chilean and US agribusiness sectors significantly exceeded the costs of starting up a new subsidiary and staffing it.

Both ABI-ICRISAT and Fundación Chile have helped their clients to internationalize. The success of Fundación Chile in developing entire value chains that are export oriented, such as the salmon industry, have been documented in the Case Study. ABI-ICRISAT is helping two of its most successful clients, namely Rusni Distilleries and Sresta Natural BioProducts to open African countries as either sources of supplies (e.g. organic products) or markets for their proprietary technologies (e.g. sweet sorghum distillation into ethanol).

The other case study incubator, which has undertaken strategic commitments in an effort to facilitate the inbound transfer of new biotechnology, is the Malaysian Life Sciences Fund. MLSF's response to moving Malaysia closer to the frontier of biotechnology is a joint venture with a US based bio technology venture capital fund and the co investment with its partner in a number of US based bio tech first stage biotech companies. MLSF's objective is to absorb and adapt the specialized competencies of bio tech venture capital management to Malaysia and to create a conduit through which international bio tech firms are able to partner, to transfer their technology to and to market through sister Malaysian biotech companies.

Other agribusiness incubators are less well prepared to provide international access and to secure the benefits, which flow from this access for their incubatees. They lack either the resources, the internal competence and management experience or the strategic vision or mandate to operate across borders. They are not organized to operate as conduits into international markets where they can support the international sales efforts of their incubatees or to support the transfer of new technologies or intellectual property rights across borders or to create economies of scope or scale among similarly positioned agribusinesses based in different countries.

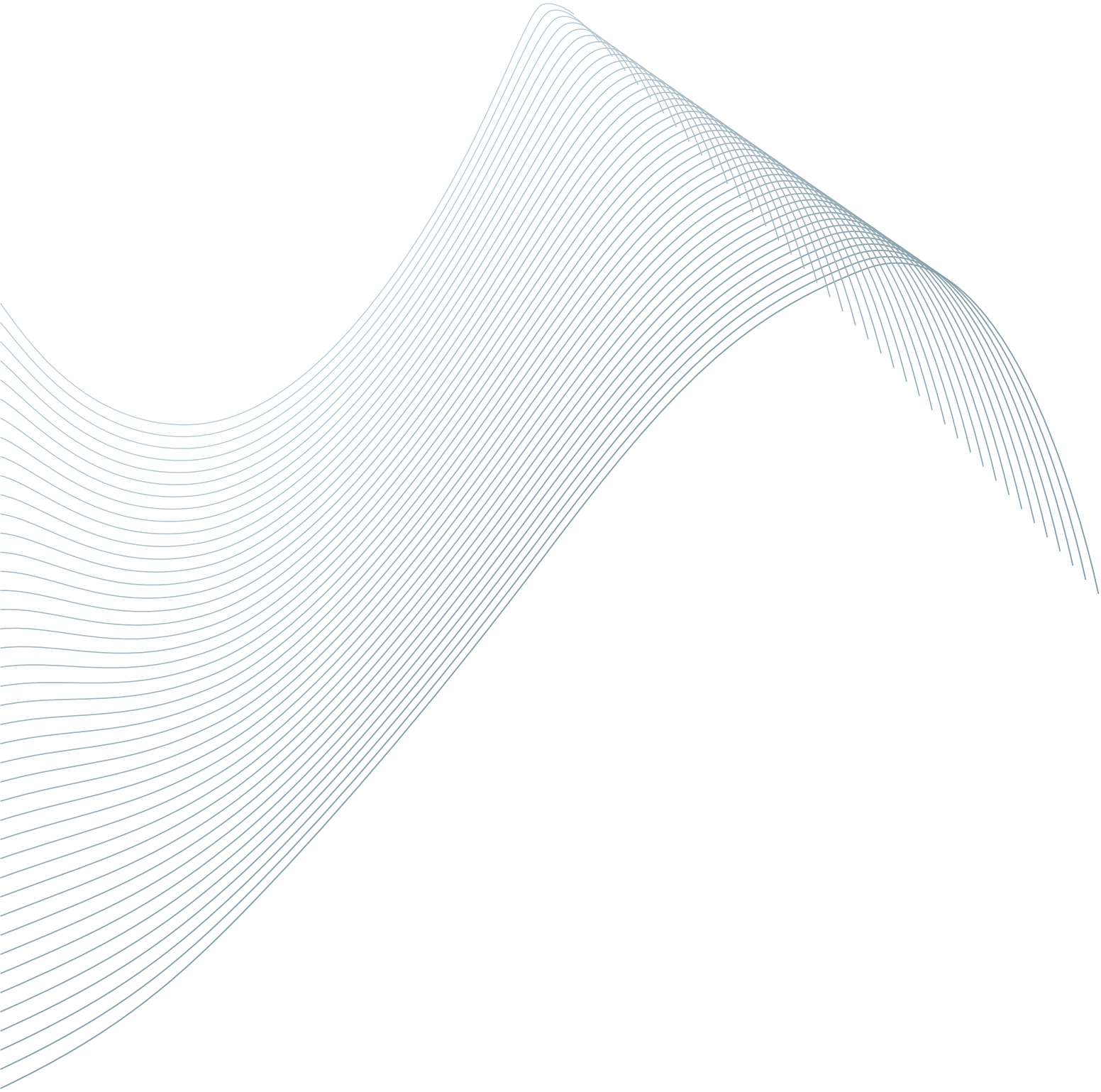
In these three areas of activity a role exists for *info*Dev to operate as an agent of the entire network of agribusiness practitioners. In this agency capacity *info*Dev could usefully perform the following functions: i) act as a good faith broker and intermediary between agribusiness incubators to qualify and assure the quality of agricultural products which incubatees in one country produced and sold to incubatees in another country; ii) act as a third party guarantor of the terms and conditions of technology transfer agreements in assuring performance under royalty agreements, profit sharing, manufacturing right transfers and other modes of intellectual property transfer; and iii) act as an agency for cross fertilization, personnel exchanges and internships between and among network members.

Appendix 6

Supportive Infrastructure

There are seven crucial business infrastructure elements in a business ecosystem which are needed to support productivity enhancement and innovation. They include the following:

- **Technology Infrastructure**-The technology infrastructure of a business ecosystem is made up of institutions and organizations that discover science, develop technology, and deploy it to users. This infrastructure element includes local/regional universities, national laboratories, applied R&D institutes, corporate laboratories; capital equipment vendors, extension services and technology transfer agents.
- **Human Resource Infrastructure**-The human resource infrastructure includes not only the current quantity and quality of human resources available within a country but also those "delivery" organizations that prepare, advance and renew skills so that available skills can adapt to changing demand. This delivery system includes preparatory schools, vocational and technical schools, colleges and universities, specialized retraining centers and continuing education programs.
- **Financial Infrastructure**-Financial infrastructure consists of enterprises and organizations, which provide initial financing for new ventures, expansion capital for growth and diversification, and modernization capital for replacing old equipment, for updating skills and for restructuring underperforming going concerns. This system includes public and private sector provided venture capital, investment banks, tradition bank credit, guarantee and lending institutions, as well as specialized industry finance organizations who are experienced in seed, start up, leasing and venture investing.
- **Physical Infrastructure**-Physical infrastructure consists of basic roads, water, sewer and electricity system as well as more advanced physical infrastructure elements that provide digital communications services, logistics support for specialized goods (e.g. cold storage, bulk food staple handing), industrial parks, specialized storage capacity and environmental disposal capacity.
- **Agricultural Market Infrastructure**-The infrastructure, which supports reasonably efficient commodity trading and national market price discovery, is particularly important. This includes market institutions for farm products commodities; mutually compatible information, finance and storage systems which support structured trade, supportive tax, trade facilitation and market regulatory systems, and culture which encourages risk taking and new agribusiness formation. Most important perhaps is an effective agricultural extension system which encourages farmers to organize into larger production units and to pursue farming and farm related activities as businesses.
- **Manufacturing/Processing Infrastructure**—a critical element to the agroprocessing focused incubators, this involves either physical processing space as part of the incubator (as found in the Uganda Industrial Research Institute—who utilizes processing templates to run clients through on a rotating basis, or an extensive, private sector network of manufacturing and processing partners interested in supporting the objectives of the incubator. The attraction for private sector partnerships is the strength of the incubator with regards to brand development, marketing and value chain management; making the private sector partner little more than a means to an end with regard to value-added processing.
- **Quality of Life Infrastructure**-A final important aspect of the agribusiness ecosystem includes the factors, which support farmer and entrepreneur welfare, cultural and gender diversity and environmental quality. These include housing, cultural and recreational amenities and self help programs.



Appendix 7

Agribusiness Incubators Different World Views

Different incubators see the world differently. Depending on the needs of the agribusiness ecosystems around them, they understand their role in these systems differently, as well. Their own history and their entry point into the business of agribusiness development greatly influence their worldviews and so does their own corporate evolution.

These differences in worldview are reflected in the fact that various incubators have developed their own private languages. The specialized concepts and expressions, which they use when describing the work that they do and their role in the business systems which they attempt to change reveal a great deal about their beliefs and perceptions.

Fundación Chile perceives a world economy, which contains multiple market failures and cross border obstacles to technology transfer, which handicap enterprises within developing countries either from serving specific market niches or from applying best in class technology. The Fundación sees its role as compensating for these market failures through the knowledge, demonstrated business successes and risk capital, which it can provide. Fundación Chile's management refers to "relative innovations" by which they mean technologies and management methods applied for the first time in sectors, which are also new to Chile. Fundación Chile carries out projects that open new paths, which provide examples of relative innovation. These, in turn, inspire others to take Fundación Chile's initiatives to new levels.

The projects Fundación Chile undertakes are always novel. However, all also have the potential of being replicated by other stakeholders. At the core of Fundación Chile's activities is the Technology Center, which pursues more than 100 projects annually. The Technology Center refers to itself as a "do tank" as contrasted with a "think tank." The Technology Center conducts research, development, adaptation, and promotion of innovations. It also facilitates interactions between different sectors and finds technologies intersections. Fundación Chile has found that "transverse technologies" are particularly valuable for job creation and competitiveness enhancement in Chile. These are technologies which often open new markets. They apply at the fault line between two or more traditional lines of business, where they converge and where they can join together to open new market. One example is the "boxed beef" project, which involved processing fresh meat in livestock production areas and packing and shipping it in a new form of vacuum packaging.

Villgro's worldview is very different from that of Fundación Chile. Villgro knows about a world in which innovations and technologies appropriate to rural India are abundant, but difficult to deliver to the rural poor. Villgro believes that innovations are available from multiple sources but most significantly from farmers themselves. It is they who understand the needs and the context of rural India better than anyone else. The challenge to which Villgro addresses itself is to create linkages between innovators, entrepreneurs who can capitalize on and produce these innovations in affordable forms and distribution networks, like Villgro Stores, which can deliver these innovations to rural communities throughout India.

Villgro makes a distinction between innovations/ innovators and entrepreneurs/ incubatees. The non-profit has increasingly found that although innovators are more likely than not to be located in rural space, qualified entrepreneurs/incubatees are not. In order to remedy this situation, Villgro attempts to bridge the two, to facilitate the transfer of new products and service designs from the former to the latter. It accomplishes this though the securitization of innovations in the form of properly claimed intellectual property rights. It facilitates the subsequent transfer to existing of these rights to start up enterprises headed up by entrepreneurs with

successful track records and with requisite competencies in manufacturing, distribution and marketing which are matched to the new innovations. In this transfer process Villgro plays the role of honest broker.

Villgro's management has developed a unique vocabulary for representing both its activities and its mission. One of its favorite terms of art is "User Centric Innovation." By this term Villgro means efforts, which it undertakes on behalf of its rural clients to test innovations in rural geographies and in these local settings to evaluate their sustainability. The tests to which Villgro routinely subjects new products and services before committing either to enhance them through its incubation efforts or to sell them through Villgro Stores, include tests for: i) rural affordability, ii) value for money, measured in terms of enhanced farm productivity, diversified rural income or enhanced consumer benefits; and most importantly iii) rural market acceptance.

Other incubators embrace still other worldviews. ICRISAT, for example, assumes that progress in agricultural development is all about discovering new technologies. The role of its ABI is to find agents who are able to mobilize the technologies, which it is developing and deliver these to farmers all over India. From ICRISAT's perspective it is research and development, which drives entrepreneurship and assures its success not the other way around.

Appendix 8

Spin-Offs of Fundación Chile

Fundación Jalisco originated in 2005 when the governor of the State of Jalisco made a visit to Fundación Chile together with private sector leaders from Guadalajara, Mexico. This visit produced a consulting agreement between the Agricultural Council in Jalisco and Fundación Chile to develop an institution, which became the Fundación Jalisco Innovation and Development Inc. With advisory support from Fundación Chile, the FJ commenced operations in 2006.

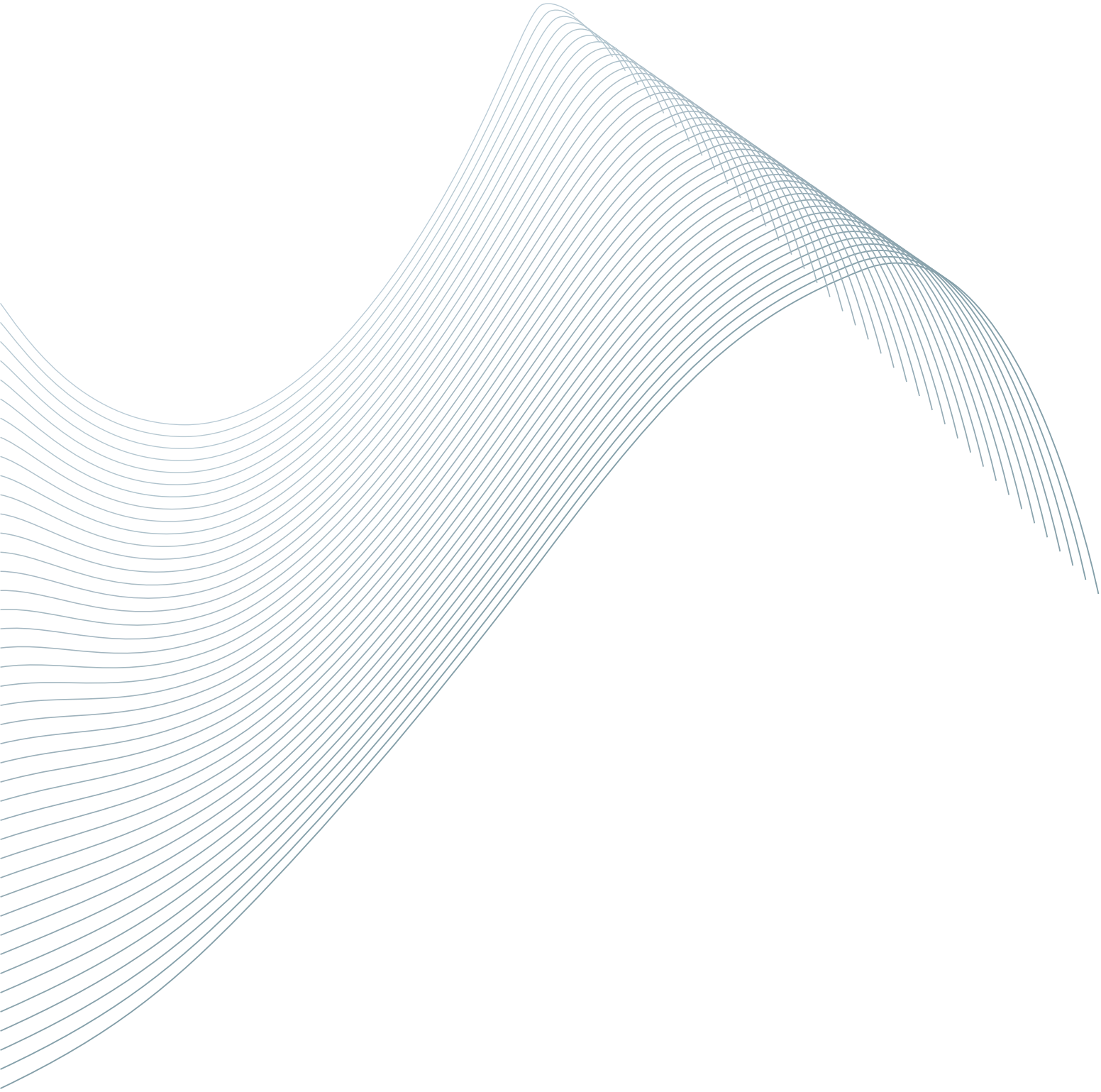
Fundación Chile is a generator of visionary development plans as well as an institution which is capable of forming entirely new industries with its own capital resources. It is particularly strong in "in-house" R&D as well as at the creation, convergence and initial commercialization of innovative agricultural products and services. Fundación Jalisco decided early on that it would require too much investment and too much time to replicate a model as large and self directed as Fundación Chile.

The leaders of Fundación Jalisco decided instead that they wanted a smaller, more practical and market responsive incubator. They decided to be an applier of technology rather than a generator of innovative technologies. Fundación Jalisco's role is more focused on forming value chains, motivating and integrating the interests of key actors, including investors, promoters, field extension agents, and farmers in new agribusiness areas. As such, Fundación Jalisco is a relatively "lean and mean" agribusiness innovation and incubation institution. It has a professional staff of only twelve. The FJ has been successful in the development of its initial agribusiness value chain, blueberries.

A second example of an agribusiness innovation/incubation spinoff of Fundación Chile is Fundación Sonora, which also conceived during a visit to Fundación Chile… this time by the Governor of Sonora who was accompanied in his visit to Chile by entrepreneurs in the agriculture and fisheries industries. Since its inception in October 2007, Sonora Foundation, has developed various projects such as the mariculture project, which aims to boost fish farming and sea ranching, and the wine project, which has fostered the initiation of wine production and, in turn, has stimulated rural tourism.

Yet another Fundación Chile spin-off is Fundación Peru, which was formally launched in 2010 with a grant of US$1 million from the Inter American Development Bank and US$600,000 from private contributions. While Fundación Peru has helped with the launch of new businesses, it aims primarily to be a center of innovation. It has developed a strategic alliance with Fundación Chile.

Each of the Fundación Chile inspired models is substantially smaller and more focused than Fundación Chile. Fundación Jalisco and Sonora in Mexico are much smaller in scale and more regional in focus. Fundación Peru has the ambition to serve a similar function as Fundación Chile and it is striving to become its nation's first center of innovation. However, it has a more modest starting point than the US$50 million endowment with which Fundación Chile started.



Appendix 9

Incubator Design Basics

A lean staff which blends a diversity of skills that typically include mentoring skills, analytic skills, technology transfer skills and seasoned agribusiness management experience. There is no substitute for having been there and actually managed an agribusiness successfully. Incubators also need to develop competencies in early enterprise problem detection and in problem solving and an attitude, which encourages rapid business-like responses to new market opportunities and positive attitudes toward customers.

A mixture of internal competencies and external competencies. Strong relationships with a peripheral set of specialized service providers, like law firms specializing in intellectual property (IP), consultants specializing in package design, etc. are quite useful. Villgro has developed precisely this kind of periphery. IAA-IPB can access a broad range of technologies through its network of research centers within the university. ABI-ICRISAT can draw upon a community of internationally recognized scientists present on campus and the link with the research centers system in India. Successful incubators operate effectively both inside and outside their organizational periphery.

Incubators need periodically to reevaluate their strategies, reengineer their activities and update their internal competencies. They also need to be able to start up new value adding activities when they indentify unsatisfied needs within their own business ecosystem. A good example of this activity are the two new for profit activities—franchising and business advisory services—which TnsMz has taken up in Mozambique. Both IAA-IPB and ABI-ICRISAT are also reorienting their business strategies from revenue growth to capital gain growth through investment in equity of incubatees.

Organizational agility and a capacity for rapid institutional learning are valuable assets, which are best inculcated through the recruitment of fast learning and highly motivated staff, through a level of staff turnover which is moderate (i.e. internship programs offer an effective way for injecting new thinking and new knowledge into the incubator) and by developing strong trusting relations with leading firms in the sector. To the extent that the incubation process is successful, learning extends from incubator to incubatee and continues beyond. For example, a graduate of ABI-ICRISAT's incubation program, Aakruthi Agricultural Associates of India (AAI), is a start up venture. Its four founders launched it in 2004 as an attempt to offer a for profit alternative to agricultural extension services in Andra Pradesh Province which the government provides. Today, AAI participates in three lines of business. It is a multiplier and distributor of new seed varieties. It is also a matchmaker and agent for farm level groups wishing to undertake contract-farming operations with major agribusinesses. In addition, AAI provides consultancy and technical support services on a project-by-project basis to international and national organizations.

Strong Capital Structures. No incubator included in this set of case studies is able to fund its operations solely from fees, which it collects for providing incubation services. All of the case study incubators depend on outside funding either from governments, donors or foundations. They can also benefit from either equity investment (see Fundación Chile) or from profit sharing (see IAA-IPB). In general, incubators who enjoy strong donor support in the form of endowment equity, like Fundación Chile, are better off than incubators who enjoy support based on multi-year grants or financial support tied to program commitments, like the Uganda Industrial Research Institute (UIRI). The UIRI, in turn, is better off than incubators who are financed based on annual budgets or other multiple, short term funding sources like IAA-IPB Bogor.

Dense Network Structures. Many incubators concentrate on the internal side of incubation. They lack the contextual knowledge, the "know who"

which is needed to help insert their incubatees into the larger business ecosystem. Rather they concentrate on "know how." However, both " know how and know who" are essential for success in agribusiness. Gaining entry into local markets comes about through networking. The distribution and marketing networks into which an incubator is able to introduce its incubatees are as important for sustaining its growth as the technical knowledge, which the incubator can impart concerning appropriate technologies, production processes, pricing and service strategies and post graduate financing options. Likewise the farm product sourcing networks to which an incubator can introduce its incubatees are more important for their success than access to a well-equipped business center, laboratory, industrial kitchen or demonstration factory and warehouse.

Risk Management. In addition to the risk inherent to agribusiness, agribusiness incubators will also need to manage more general risk. Important take-away lessons with respect to incubator risk management include the following:

- Become comfortable with an ownership stake of 20-50%. Leverage your investment with other sources of equity. Avoid investment opportunities that don't involve other investors who are willing to partner or to undertake risk jointly. The first investment into any incubatee and the last investment out should be the equity of the founder/leader… even it that equity involves perspiration and inspiration without pay.
- Investment partners can help to lower an incubator's monitoring costs as well as to lower direct incubator exposure. Investment partners worth having will say "let's close this business" when risks outweigh opportunities. They will minimize the possibility that an incubator manager falls in love with his/her company.
- Insist on a board of directors which is independent of the management, knowledgeable and mature.
- Ensure that you have the right entrepreneur, one with a high level of skills, commitment, and flexibility to adapt the business plan to changing conditions. The entrepreneur must be able to work effectively with a good board of directors.
- Know your "value at risk", that is, be clear about the initial investment amount that is being made both in kind and monetary, up until specific development milestones have been reached. Be clear about how much will be lost if things go badly.
- Treat small companies as if they were big companies. That is ensure that all companies keep current and complete accounting books and comply with high standards of legal, administrative, and governance practice.

Strong Brands. The best way to build a sound market reputation in any service market, including one for incubation services, is to continuously exceed stakeholder expectations. In the case of agribusiness incubators the most important stakeholders include donors and foundations, which finance their activities, incubatees, government policymakers, financiers and already established agribusiness companies. This reputation has certainly been gained and exceeded expectation in several of the most successful incubators among the case studies: first and foremost Fundación Chile, but equally important ABI-ICRISAT, Technoserve Mozambique, Timbali, IAA-IPB, etc.

Calibrating and then exceeding expectations for each of these stakeholder groups is important. To that end, incubators which are transparent, incubators which produce annual reports, progress reports on their activities, create their own blogs and websites and offer audited financial statements to their stakeholders enhance their brand.

For incubators "trust" is particularly important. Being perceived as an honest broker—one that can be relied upon not to advantage either of incubatees or donors/investors—is essential for creating a neutral nexus where emergent companies can find harbor and support until they mature sufficiently to capitalize the value of their newly internalized capacities. Having the incubatee emerge from the incubator, at the right time, and when they emerge being fairly and realistically priced are essential incubator actions, necessary for sustaining its market nexus function.

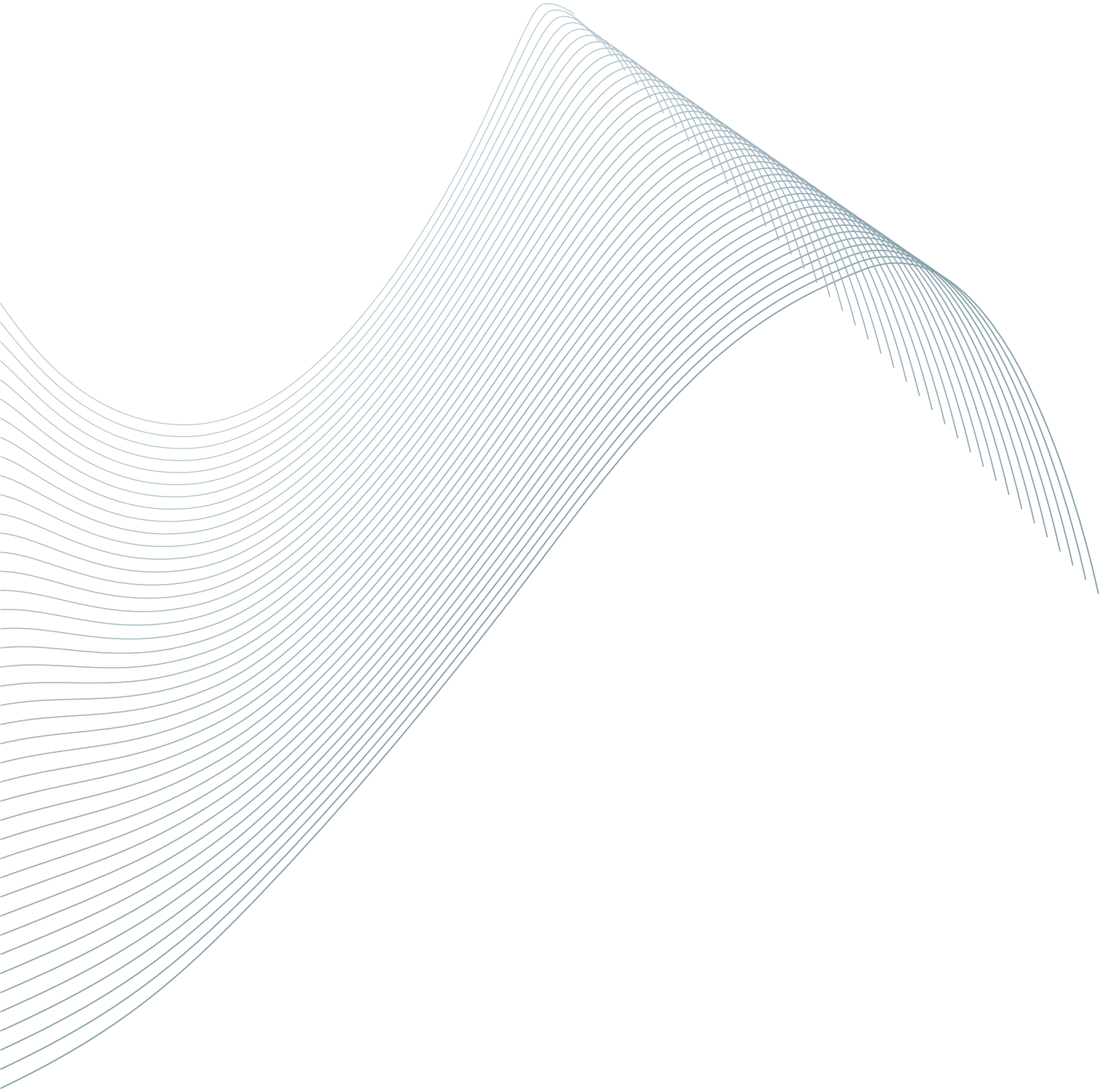
Good governance is a particularly important aspect of incubator brand identification. Being responsible to an independent board of directors is the key here. Members of the board need to be representative of all stakeholders, knowledgeable of agribusiness and decisive. At the same time, independent of the incubator's management.

A sterling brand is particularly important for incubators like Fundación Chile which are public-private institutions but which are run like private companies. This is because the incubator's innovation cycles and technology development cycles are almost always out of sync with government policy cycles.

Top management must be knowledgeable of and fully conversant with emergent technologies, new market opportunities and strategic aspects of the prevailing agribusiness ecosystem. In the case of Fundación Chile, its Chairman is nominated by the president of the country but validated by all of the other independently selected members of the board.

IAA-IPB brand is based on its success as the only agribusiness incubator in the country. It has been able to survive when many other incubators have ceased to operate. It performed when others have underperformed, and it continues to grow based on a persistent approach to help start-up enterprises succeed.

19 Private sector representatives have dominated Fundación Chile's board since its inception.



Appendix 10

Illustration Of Phased Development: Fundación Chile

Because of its long history as an incubator of agribusiness, the history of Fundación Chile provides important insights for other incubators. As noted above every incubator follows a development trajectory that corresponds to the opportunities and risks, which emerge from within its business ecosystem. For these reasons, no two incubator development tracks are exactly alike. The evolution of Fundación Chile's incubation process demonstrates this general fact. Although its development can usefully be divided into five stages, each of these is slightly different than the generalized stage discussed above because they emerged in distinct competitive contexts.

- Stage 1-Building an Organization for Innovation (1976-1980)
- Stage 2-Value Chain Development and Strategic Investments in Pioneering Enterprises, The "Big Bets" Era (1980-1990)
- Stage 3-Continuous Reinvention and Adaptation (1990-2000)
- Stage 4-Strategic Interventions in Value Chain and Continued Reinvention, (2000-2007)
- Stage 5-Finding New Niches in the Innovation and Incubation "Ecosystem" (2008-2011)

Stage 1-Building an Organization for Innovation (1976-1980). Established in 1976, the initial efforts of Fundación Chile were focused on building an organization for innovation and incubation with a narrow focus on two areas: i) electronics and telecommunications (owing to its co-founder IT&T's business experience); and ii) food and nutrition. The focus on food and nutrition was on exportable fruits and vegetables and improving the national food system. In 1979 Fundación Chile initiated the "Asparagus Cultivation" program, encouraging its export while providing technical assistance to farmers, in the introduction of the green asparagus, a variety in high demand by the U.S. and European markets. Fundación Chile helped foster this opening of international markets, while dealing directly with the producers, to increase the area planted with asparagus. At the onset of the program, Chile was producing 6.2 tons a year. Fundación Chile operated 40% of the national acreage dedicated to asparagus crops. As a result of this program cultivation techniques were adopted that led to improved product quality and to a considerably increase in exports. Ultimately, asparagus exports reached 7,550 tons in 1990.

In this initial period, Fundación Chile identified two distinct areas of action: "agribusiness" and "marine resources", both with a strong emphasis on exports. The organization developed a capability for selection of value chains with export potential and detection of deficiencies in export value chains and identification of target interventions. The institution identified its initial vision of being a catalyst of development for the non-traditional export sector.

Stage 2-Value Chain Development and Strategic Investments in Pioneering Enterprises, The "Big Bets" Era (1980-1990). The early 1980s period marked the beginning of Fundación Chile's "big bets" era, where the organization invested directly in companies and developed programs especially aimed at encouraging export in agribusiness sector, first with asparagus, then salmon and aquaculture, then meat, then berries.

Building on the approach used by Fundación Chile to develop asparagus, the Salmon Project began in 1980, geared towards establishing a local knowledge base to learn how to farm salmon in captivity, drawing from salmon cultivation technologies in the U.S. and Norway. Fundación Chile decided to acquire "Domsea Farms", an aquaculture company,

which eventually became "Salmones Antártica", which would begin salmon ranching and farming activities in Chile. In the following years the institution built a moist feed plant and another plant for salmon processing. At the time of the Domsea Farms acquisition, Chile's exports of salmon and trout were only 300 tons; towards 1990, exports reached over 24,000 tons.

In 1982, the bets continued with the creation of "Cultivos Marinos Tongoy", a company geared towards cultivating and exporting oysters. This same year the institution developed the "Boxed Beef" project, which aimed to process cattle in the livestock production areas and to transport the meat to consumption centers, in vacuum packaging. This initiative, led to the creation of Procarne in 1983, which was later transferred to the private sector. The main impact of this project was the creation of a new industrial activity, which together with creating jobs introduced more hygienic and better quality products in this industry.

In 1985, Fundación Chile established "Berries la Union" and a berry program aimed to introduce new species and varieties of berries and to expand their growing zone. It also introduced production techniques recently introduced in the United States and Europe. Genetic material was imported; varieties selected; specialists in berry production and processing came to Chile; and courses and seminars were offered in southern Chile.

During the late 1980s, Fundación Chile continued to create a string of various "demonstrative" (or pioneering) companies including: Tenagro Cautín (Berries in the Bio Bio region) and Salmones Huillinco (Alevin, first juvenile Atlantic salmon company in Latin America) in 1987; Salmotec and Tecnofrío Cautín in 1988; and Granjamar (Turbot) in 1989.

In synthesis, the 1980s ended with Fundación Chile fully positioned as a catalyst agent for innovation and export development within the country. This success with the salmon industry validated Fundación Chile's work with the business community. From then on, when the organization sought to develop a new project, it was easier to find new private partners. This success however had its flipside. An explosive growth meant that many of the later business initiatives would end in mixed results, and some in outright failures. Nonetheless, Fundación Chile's bets during the 1980s, in good part are the product of early diagnosis in the 1970s.

Stage 3-Continuous Reinvention and Adaptation (1990-2000). In the late 1980s and 1990s, Chile experienced a changing, very rapidly growing economy—with GDP per capita increasing from US$3,400 to US$7,360 and exports growing from US$4.2 billion to US$15.4 billion from 1986-1996. In this context, Fundación Chile needed to adapt to more dynamic markets, more sophisticated business environment, and a culture of innovation that permeated the Chilean business and economic ecosystem. The initial competitive advantages of Fundación Chile in identification and development of innovative projects, diminished in comparative terms. Not that Fundación Chile was less potent, because indeed its capabilities and prestige had continued to grow. However, universities, NGOs, government agencies, and other institutions had entered into the space of innovation. Hence, Fundación Chile needed to be in a state of continuous innovation in order to continue to make a significant contribution towards development.

The institution engaged in many interventions, which were transversal in nature, helping strengthen entrepreneurship, and fostering new human capital capacities that were beyond the specificity of a sector, such as entrepreneurship training. For instance, Fundación Chile created a forestry management program and acted as the "innovation consortium" for the sector, where the introduction of new management and production techniques were promoted, in addition to carrying out joint initiatives with other institutions. Fundación Chile also started up a Job Competencies program, which aimed to innovate in the management and development of human capital by introducing and disseminating standards and methodologies to identify, develop and administer peoples' competencies in job contexts, in support of companies' competitiveness and people's employability.

During the 1990s, Fundación Chile continued to promote other new sectors ranging from introducing the cultivation of abalone and co-owning the largest abalone export company to participating in the first national development of extra virgin olive oil.

Stage 4-Strategic Interventions in Value Chain and Continued Reinvention (2000-2010). At the turn of the century, Fundación Chile did not lose its primary vocation for supporting the creation of pioneering companies. Indeed, the model of creating companies to introduce and disseminate a new technology remained one of Fundación Chile's biggest methodological contributions. For example, in 2004, Fundación Chile supported the creation of Oleotop, the first canola oil producers oriented toward replacing fish oil in feed for the salmon industry. This company introduced this innovation after the extractive oil industry had virtually disappeared from Chile in 2001, as a result of a crash in international prices for vegetable oil crops. Oleotop has become a highly successful company—growing from an initial investment of US$7 million in 2005 to annual sales of US$50 million in 2010—and linking rapeseed farmers to industrial markets demanding canola as an input for fish food for the rapidly growing salmon industry.

This phase also marked a time of "soft" innovations—not necessarily tied to the production of specific good, but in the participation of the organization in financial innovations, such as Fundación Chile's creation of the first forestry securitization program for the country in 2003. Also, in 2002, Fundación Chile was merged with the Chilean Technological Institute, INTEC, in order to strengthen this organization and the merger enabled Fundación Chile to take advantage of INTEC's technological skills, especially in information sciences, chemical metrology, environmental technologies, and renewable energy. From this point forward, Fundación Chile progressed towards a matrix structure.

Stage 5-Finding New Niches in the Innovation and Incubation "Ecosystem" (2008-2011).The most recent stage of Fundación Chile's evolution marks a period of adaptation in a growing field of innovation centers, incubators, and venture capital in Chile. Early on, there were few other innovation organizations, no "Innova", no CORFO, no Endeavor…..Fundación Chile had to do everything, find the opportunity, find the entrepreneur, get the money, create the market, etc. In recent years, Fundación Chile has taken stock of what it does well and has restructured its activities to reposition itself within Chile's (and Latin America's) densifying innovation and incubation "ecosystem." In a more developed ecosystem with more entrepreneurs and more support organizations, the Fundación is now intervening in the supply chain for innovation. Fundación Chile will invest in a company because it can make a technological, financial, and/or public policy contribution, and can leverage on the entrepreneur and other partner organizations. In recent years, Fundación Chile is involved in more "early stage" companies, exiting and letting other organizations be involved in the scale-up stage.

Fundación Chile now characterizes itself as a "do tank" rather than a "think tank", recognizing that knowledge creation is not an end in itself, and leaving those functions to the universities. Fundación Chile sees its higher purpose in "making things happen and articulating the key players" by levering its trustworthy brand. Fundación Chile is consolidating its position in the market as a well-respected public-private organization, with a strong corporate structure. Corporate governance gives stability and guarantees that the funds are really well used. Fundación Chile's solid role and reputation as a highly successful public-private institution and trustworthy independent broker garners trust in both the public sector and private sector. One of Fundación Chile's main roles now is to coordinate several national and international institutions with an interest in generic technologies for specific sectors. It also contributes by finding commercial applications for the technology and by creating skills in the country that allows sectors to apply these developments, which generally speaking are long-term. A clear example in this area is biotechnology, where the Fundación has developed vaccines for salmon or fruit biotechnology through the creation of consortiums. Fundación Chile effectively combines a public mission and private sector model.

Whereas Fundación Chile used to be organized according to industry sectors (e.g. forestry, fruit, salmon, etc.), now it has reorganized in more transversal, matrix structure according to transversal areas (e.g. sustainability, food and biotech, ICT, and human capital).

In its most recent stage of evolution, Fundación Chile has reorganized its operations around the "management of innovation." Now Fundación Chile operational funds are competed for by various internal business units involved in: providing

technology services and certification; supporting company start-up, spin-offs, and scale-ups (internal seed capital); complementing internal sources of technology by purchasing, partnering with or supporting external sources of technology; developing strategic alliances with companies and partners; and selling and licensing technologies (see figure below).

Figure 6 Current Structure of Fundación Chile's Operations

Source: Fundación Chile, Powerpoint presentation by Marcelo Vásquez, 2010.

In conclusion, the evolution of Fundación Chile shows how an incubator must first develop a basic business infrastructure and clarify its mission, then prove that it can successfully help to incubate new companies and industries. One of the keys to success of an agribusiness incubator is its ability to identify and make strategic interventions in a value chain by developing pioneering companies that demonstrate to other investors and companies a new technology or by filling a specific gap in the value chain. The Fundación Chile story also points to the need for "learning-by-doing" and engaging in a process of continuous re-invention, especially as the ecosystem for incubation becomes more complex.

Appendix 11

Target Clients and Selection Process

Incubator	Target Clients	Development Stage	Selection Process
Fundación Chile (Chile)	Medium and large enterprises	Advanced or Highly Innovative	Based on feasibility study of company and value chain
Technology Based Business Incubator, Federal University of Viçosa, CENTEV (Brazil)	Technology-based entrepreneurs, primarily university professors and students in agribusiness, IT, and other fields	Start-up, innovative companies	Rigorous selection process for admission into the pre-incubator and incubator programs. Developed online software to monitor the incubatee selection and business development processes
Fundación Jalisco (Mexico)	Entrepreneurs & companies to fill in key missing elements of the target value chains (e.g. nursery, processing, commercialization) plus farmers	Aiming for advanced, even world-class, entrepreneurs and companies to manage critical value chain links	Key selection criteria include feasibility of value chain and management capabilities of entrepreneurs and company managers
Incubator for Agribusiness and Agroindustry Bogor Agriculture University, IAA-IPB (Indonesia)	SMEs	Start-up or Small	University Graduate of IBP, 5 C's (Credibility Capability, Capacity, Condition, Collateral), two evaluations in the first year
Agribusiness Incubator-ABI, ICRISAT (India)	Technology based companies in the area of Agriculture and Agri-biotechnology An enterprise, industry association/an R&D Company who desires to commercialize the jointly developed technology through ABI-ICRISAT	Start-up companies or R&D company	Homology between the expertise/facilities/services available at ICRISAT and technical facilities/assistance required by the applicant. The technology or services should be based on innovative concepts and should seek to develop a proprietary position in association with ICRISAT. The entrepreneur should have adequate technical education, business experience to exploit the technology and financial capability to bring the required finances
Villgro (India)	SMEs Link rural concept developers to experienced rural entrepreneurs and to technology refinement and commercialization experts	Zero stage development	Management skills, value of proposed goods or services to rural consumers and farmers; potential consumer benefits for rural populations in Southern India
Malaysian Life Sciences Capital Fund, MLSCF (Malaysia)	Advanced biotech companies offering innovative agribusiness applications	First stage development	Commercial merit of new technology, competence and reputation of chief scientist, management team strength and experience, merit and sophistication of the business plan
Timbali Technology Incubator (South Africa)	Women farmer	Zero stage development	Satisfy following criteria: ■ Access to own land ■ Ability to service infrastructure costs ■ Full-time involvement and commitment to business ■ Product and market accessibility ■ Sound track record and growth potential of the client and enterprise ■ Ability to pay for services in future through levies ■ Entrepreneurial inclination

Incubator	Target Clients	Development Stage	Selection Process
Technoserve of Mozambique (Mozambique)	Medium Scale Agribusiness which operate as potential agents for change inside supply chains that are susceptible to reengineering and restructuring	Transformative from low value added to high value added	Based on feasibility study of company and value chain and further based on pioneering aptitudes of enterprise owners and their willingness to lead a sector transformation process
Uganda Industrial Research Institute, UIRI (Uganda)	Small and medium scale	First stage development	A comprehensive business plan which illustrates the feasibility and viability of the company, the potential for commercialization, the timeframe of the collaboration and issues of enterprise ownership. A willingness to submit periodic financial and operational reports for review, sign and abide by a Memorandum of Understanding (MOU) with UIRI, and to learn and submit to instruction and professional advice.

Appendix 12

Cost-Benefit Analysis of The Impact of Fundación Chile

A cost-benefit study of Fundación Chile was completed in 2006. Its overall conclusion was that the incubator has generated net benefits for the Chilean economy during its 30 year existence. The study estimated that Fundación Chile has had a net economic impact of over US$1.3 billion measured with respect to seven selected agribusiness programs in which it has had an influence between 1976 and 2005. The net benefit attributable to Fundación Chile was estimated by measuring the benefits realized in seven agribusiness programs—ranging from the introduction of berry cultivation, salmon farming, and boxed beef, to three programs supporting higher productivity in the forestry industry—in comparison to the total costs associated with Fundación Chile over its entire 30 year history. The study indicated that these benefits represent a conservative estimation because only on seven of the many programs that Fundación Chile has managed are included in the measurement of benefits, while the totality of costs of Fundación Chile activities were included.

The benefits were measured in terms of both productive innovations and process innovations attributable to the seven programs. The methodology used to measure benefits of Fundación Chile, productive activities estimated the beneficial results of innovations that were adopted locally and that enable a product to move toward the production possibility frontier and achieve an increase in value added as a direct result of specific Fundación Chile programs. Process innovations correspond to the difference in the cost of production between using traditional technology and the innovative technology. Using this methodology, the social benefits attributable to Fundación Chile are shown below for the seven selected programs.

Total costs of Fundación Chile were measured as the present value of all expenditures made by the institution based on information available in the accounts and balance sheets of Fundación Chile for the period of 1976-2005. Costs were estimated according to two different methods as shown in the following table.

Benefits Attributable to the Fundación Chile, 1976-2006

Program	Millions of US$ (2005)
Salmon	555.7
Berries (rasberries and blueberries)	148.9
Procarne (meat products)	146
Quality Control of fruit	71.9
Forestry Technology Transfer	131.6
Forestry Certification	229.6
Forestry Securitization	19.1
Total Social Benefits Attributable to the Fundación Chile	1,302.70

The two methods used to estimate the costs of Fundación Chile yield very similar results, on the order of magnitude of US$1.05 billion. Except for minor accounting differences these two results are basically equivalent.

Overall, the results indicate that the US$1.303 billion benefits of the seven selected programs are 23% higher than the US$1.05 billion in total costs of Fundación Chile over the 30 year period. As indicated in the C/B report, this net positive result is a conservative estimate because of the following factors: i) other Fundación Chile programs (such as

asparagus, citrus fruits, apples, and other aquaculture) were not included in the tally of benefits; ii) these other programs presumably benefitted from the innovations promoted by Fundación Chile; and iii) additional benefits not accounted for in the C/B analysis include the reductions of cost achieved in not having a duplication of efforts in R&D for these sectors and programs that were able to access Fundación Chile's technology. Consequently, this conservative estimate of positive net benefits implies that the real annual internal rate of return of Fundación Chile activities over the 30 years exceeds 10.5%. This result is in line with a previous study of the net social benefits attributed to Fundación Chile which was completed in 1995.

Benefits Attributable to the Fundación Chile, 1976-2006

First Method		Second Method	
Factors (Present Value)	Millions of US$ 2005	Factors (Present Value)	Millions of US$ 2005
Expenditures	-1,189	Operational Deficit	-1,091
Interest Earnings	118	Use of Fixed Assets	15.3
Value of Assets	23	Use of Working Capital	-2
		Subsidiaries (Net)	25
TOTAL	-1,048	TOTAL	-1,053

Source: Jorge Quiros Consultores Asociados (2006), "Fundación Chile: Historia e Impacto" in 2006

About *info*Dev

*info*Dev is a global partnership program within the World Bank Group which works at the intersection of innovation, technology, and entrepreneurship to create opportunities for inclusive growth, job creation and poverty reduction. infoDev assists governments and technology-focused small and medium sized enterprises (SMEs) to grow jobs, improve capacity and skills, increase access to finance and markets, ensure the appropriate enabling policy and regulatory environment for business to flourish, and test out innovative solutions in developing country markets. We do this in partnership with other development programs, with World Bank/IFC colleagues, and with stakeholders from the public, private and civil society sectors in the developing world.

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