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IFPRI Discussion Paper 00699
May 2007

Building Public–Private Partnerships for Agricultural Innovation in Latin America

Lessons from Capacity Strengthening

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PUBLISHED BY

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ACKNOWLEDGMENTS

The authors thank Ponniah Anandajayasekeram and an anonymous reviewer for their comments on earlier versions of this paper. They also acknowledge valuable contributions of information on research partnerships through representatives of various public and private agencies in Costa Rica, the Dominican Republic, Ecuador and El Salvador. Thanks also go to Patricia Ross and Elizabeth Carbone for supporting the process of publication. Any errors are the sole responsibility of the authors.

ABSTRACT

Public–private partnerships constitute a new mode of operation in many fields of development, including the development of innovation in developing-country agriculture. Capacities to identify opportunities, develop common interests, and negotiate commitments are prerequisites for successful public–private partnerships. Yet, many public–private partnerships fail due to lack of both skills among the partnering agents and efforts to strengthen these skills.

The International Service for National Agricultural Research—on its own from 2002 until 2003, and as a division of the International Food Policy Research Institute thereafter—has studied 124 public–private partnerships in agriculture in nine Latin American countries through its initiative on public–private partnerships for Agro-Industrial Research in Latin America, (Hartwich et al. 2005). The project also supported processes of partnership building in seven agricultural production chains in Costa Rica, the Dominican Republic, Ecuador, and El Salvador by holding awareness-building workshops, mapping agri-chain development opportunities, undertaking chain analysis, identifying common interests, negotiating and designing partnerships, and supporting the development of partnership agreements. Support was also given in documenting the above meetings to ensure that proposals were developed and formal agreements established. In all cases, partners sought additional external resources to complement the contributions of the partners.

This paper examines these seven cases of public–private partnership building in which private-sector companies, producer associations, and research organizations engage in collaboration for the purpose of developing innovations in agricultural production and value chains. The paper considers different points of entry to partnership building, emulating best practices. The paper describes (a) how common interests among multiple stakeholders have been identified; (b) how partners have been motivated to participate in partnerships; (c) how the roles of different brokers within or outside the partnerships have fostered partnership development; and (d) how the contributions of partners have been negotiated to ensure that partnership arrangements are in alignment with the interests of the partners, their capacities, and the prevailing technological and market opportunities. The paper targets policymakers and administrators in agricultural development, and collaborators in research and innovation projects who are interested in issues of how best to build partnerships among public and private agents.

In an innovation systems context, capacity strengthening to build partnerships can target three different levels: the partners, their relationships, or the overall network or system within which partnerships operate. The study adopted a flexible and generic approach to understanding partnership building, distinguishing five main phases: identification of common interests and objectives, negotiation and design, implementation, monitoring and evaluation, and termination or amplification.

The results suggest that public–private partnerships for innovation are justified when addressing a problem or capitalizing on an opportunity that requires collective action or the pooling of innovative capacity. Capacity strengthening in partnership building can lead to more viable partnerships that take social and development needs into account. Public-sector promoting agents play a crucial role in building partnerships, particularly in order to motivate agri-chain actors, build trust among partners, and provide credibility to such initiatives. Gradually, as partnerships are formalized, the need for leadership by the partners themselves comes to the fore. Results also show, first, that capacity strengthening efforts directed at partnership building profit from sound analysis of market and technological opportunities in the context of respective agri-chains and, second, that identifying and exploring common interests among partners is an important foundation for partnership commitment. Finally, partnerships cannot be established as a quick fix but rather require cautious organizational development.

The facilitation of the partnering process in the seven cases studied prompts six main conclusions:

1. Capacity strengthening in partnership building is specific to the value chains and actors it involves. The value chain is an appropriate context for analyzing opportunities for innovation in areas of common interest that can best be exploited through public–private collaboration.
2. Capacity strengthening for partnership building goes beyond traditional training to include horizontal learning among the partners; it a continuous process that does not suit a one-size fits all approach and requires that needs be identified taking all partners into consideration.
3. Determining when to enter into a partnership depends on the partners' analytical skills and the information available on technological and market opportunities; participation in diagnostic exercises strengthens the capacity of partners to enter into present and future partnerships.
4. The choice of appropriate capacity strengthening measures depends on the existing level of cohesion among the potential partners; for example, awareness building may not be necessary if talks about potential collaboration are already occurring. The possible entry points for partnership-building measures need to be considered to enable common themes and objectives to be identified. The "chain mapping exercise," for example, provides opportunities for key stakeholders and partners to be identified.
5. Strengthening partnership-building capacity should predominantly focus on identifying and exploring common interests among potential partners through a variety of tools that help clarify interests in terms of technology development, production, and sales. If partners do not become seriously interested in pursuing the partnership, they will not attach the necessary importance to its planning. Third-party catalyzing agents are necessary to bring partners together, motivate them, provide information, and organize space for negotiations.

6. It is important to have at least one visionary leader among the partners, be it in the private sector or in the public research community. The leader supplies the capacity for sectoral analysis in the partnership and can help to clarify and communicate the advantages the partnership offers. The leader is also important in motivating and attracting potential partners. The internal leader may also eventually take over the initiative from the external promoter, but a gradual transfer process is the most successful option.

Keywords: capacity strengthening, public–private partnerships, agricultural innovation, Latin America.

1. INTRODUCTION

Public–private partnerships are increasingly being emphasized as a mechanism for improving public service provision and implementing development programs (for example, European Commission 2003). In developing countries, such partnerships are often used to mobilize complementary and scarce resources in the public and private sectors for projects involving the development of infrastructure, communities, and agriculture. There are many cases of partnerships among farmers, private companies, government agencies, and nongovernmental organizations (NGOs) under which each entity contributes human, physical, and financial resources to foster the generation and diffusion of innovations, new forms of technologies, and knowledge to redress gaps in the development, production, processing, and marketing of improved agricultural products.

Considerable anecdotal evidence indicates the success of public–private partnerships in promoting innovation in agri-chains[1] in developing countries (Hall et al. 2002). It is not clear, however, whether such arrangements form organically—for example, on the basis of clear perceptions about prospective benefits—or whether their establishment and successful operation need to be guided by external agents. Hartwich, Gonzalez, and Vieira (2005) found that many agents enter partnerships without negotiating partner contributions or even having a clear picture of the potential benefits. Rather, agents seem to enter into partnerships on an ad hoc basis, following the common perception that partnering is inherently a good thing. Often, limited emphasis is placed on how the partners will interact effectively or how relationships might be improved. Hence, public–private partnerships often suffer from lack of trust and commitment, with the result that they fail to meet their potential (Spielman and von Grebmer 2004).

These problems raise the question of whether partnerships can benefit from the involvement of catalyzing agents in brokering the genesis of public–private partnerships and shepherding their establishment. Hartwich, González, and Vieira (2005) argue that brokering is at times a necessary prerequisite to the successful establishment of a partnership. What remains to be determined are effective mechanisms for brokering partnerships, incentives to foster them, and methods of developing capacity among potential partners such that partnerships can be effectively managed and operated.

A recent research project on Strengthening Public–Private Private Partnerships in Latin America carried out by the International Service for National Agricultural Research (ISNAR) Division of the International Food Policy Research Institute (IFPRI) analyzed 124 research partnerships (Hartwich,

[1] In this context, agri-chains are understood to be sectoral arrangements that allow buyers and sellers of a commodity, separated by time and space, to progressively accumulate value as products pass from one member of the chain to the next. Agri-chains embody all actors dealing with a commodity or group of commodities, ranging from the agricultural input industry to the final consumer, via production, transport, processing, and marketing.

González, and Vieira 2005). The project, among other interventions, supported the processes of partnership building in seven agricultural product chains in four countries—Costa Rica, the Dominican Republic, Ecuador, and El Salvador. This paper presents the lessons learned through the project's capacity strengthening efforts to develop and consolidate public–private partnerships in agricultural innovation. The study highlights several successful capacity strengthening elements relating to identifying partner's interests and motivation, negotiating partner commitments, fostering leadership, and building relationships that enable joint learning and innovation. In this context, the study focuses on policymakers and administrators in agricultural development who are interested in brokering partnership building among public and private agents in agricultural innovation and other fields.

The next section describes a theoretical model that provides insights into how and why partnerships are built. Section 3 first revisits existing approaches to public–private partnerships and capacity development in agricultural innovation systems and then presents a conceptual framework for building partnerships among public and private agents. Section 4 describes the methodology used to study incentives and capacity strengthening in the case studies analyzed. Section 5 discusses the results of the various capacity strengthening efforts undertaken. Section 6 presents the lessons learned from case studies and partnership-building efforts. The concluding section offers recommendations for similar interventions to promote public–private partnerships for agricultural innovation in the developing world.

2. UNDERSTANDING THE BUILDING OF PARTNERSHIPS

Public–private partnerships in agricultural innovation in developing countries often include agricultural research institutes, extension agencies, universities, producer organizations, farmer associations, cooperatives, and local governments, as well as many other entities. Partnerships can focus on issues such as efficient production, improved harvesting, storage and processing technologies, adding value, and the ability of local producers to react to changing demands on local and international markets. The study identified several successful partnerships: (a) between the Brazilian public agricultural research organization, *Empresa Brasileira de Pesquisa Agropecuária* (Embrapa), small producers, and exporters establishing local processing units for cashew nuts in the countries North; (b) between Chile's public research institute *Instituto de Investigaciones Agropecuarias* (INIA) and a main brewing company to develop improved barley varieties; (c) between participants of the Uruguayan Wheat Roundtable, which aims to improve the country's competitiveness in wheat production and processing; and (d) between a local producer organization in Costa Rica and the National Centre of Food Science and Technology (CITA) of the University of Costa Rica to implement processing technology for heart of palm (Harwich, Jansen, and Tola 2004). In the next section we briefly discuss the nature of agricultural innovation partnerships and the context in which they emerge. We also discuss the reasoning behind public–private partnerships and describe their inherent growth phases.

Why Innovation Partnerships Emerge

A public–private partnership can be defined as a collaborative arrangement between public, private, and/or civil sector entities under which each party contributes to the planning, resources, and activities associated with accomplishing a mutual objective, while at the same time sharing in the associated risks and benefits. Partnerships in agricultural innovation often arise from the need for an interactive exchange of information related to knowledge and technologies underlying innovation (Alcorta, Rimoli, and Plonski 1997). In this context, innovation is understood to be any novelty successfully applied in social or productive processes. It can be considered a learning process among various public and private agents (Douthwaite 2002) that can be catalyzed through the building of specific partnerships—for example, by assembling innovative talents across research and private-sector organizations. In partnerships, agents benefit from developing solutions they could not have developed on their own. Participation by the productive sector makes the developed solutions more relevant and practical, and, as a result, the probability of the innovation's being adopted increases.

Vieira and Hartwich (2002) stress the advantage of public–private partnerships that involve "real" sharing of resources, knowledge, risk, and funding in order to obtain benefits of mutual interest. The main

rationale for such partnerships is to bring together a pool of innovative talents, with complementary skills to foster a mutual learning and the development of creative ideas. This becomes difficult in practice, however, because each partner's benefits depend on the other partners' commitment and input. Therefore, elements of trust become important; if one partner trusts the other, reciprocal commitment will increase and synergy will result from joint use of complementary resources (Silva and Cotro 2004).

Partnerships often arise through individual initiatives. Researchers aiming to strengthen their position in public organizations, for example, pursue funding options in the private sector. Other partnerships originate from the initiatives of private companies to contract the services of public research organizations in the search of technological solutions to specific problems in production or processing. Many partnerships also originate from competitive grant schemes that provide funding conditional on a certain level of collaboration and co-financing (Ghezan, Mateos, and Acuña 2004; Hartwich et al. 2004a). However, partnerships that originate in these contexts do not always make the best of their potential because they are biased toward the interests of one partner or they originate solely from the search for funding without regard to partner interests.

Partnerships also develop through the intervention of certain promoting agents. For example, many research organizations and universities operate outreach and liaison offices that help to identify collaboration and funding opportunities in the public and private sectors. Sometimes such units also facilitate the establishment of the resulting partnerships. Similarly, government and donor agencies often foster collaboration among agents as a means of promoting development. Examples of such organizations include export and investment agencies, such as the Export and Investment Promotion Corporation of Ecuador (CORPEI); sectoral cluster development agencies, such as Nicaragua's Presidential Commission for Competitiveness (CPC); or private-sector development foundations, such as *Fundación Chile*.

Phases of Partnership Building

Partnership building is a dynamic process, not a static event. The public and business administration literature argues that partnerships go through processes of creation and maturation involving a set of sequential steps (see, for example, Harrigan 1986, Hennart 1988, Kogut 1988, and Oliver 1990). Fernández (1999), referring to business partnerships between firms, identifies four phases in partnership building: the strategic decision to partner, the configuration of the partnership, the selection of partners, and the management of the partnership. In a different approach to partnerships in business, Devlin and Bleackley (1988) suggest that the administration of a partnership comprises the phases of defining goals and objectives, contributing with sufficient resources, establishing responsibilities, implementing an effective mechanism of information, monitoring the partnership process (for example, through regular reports and revision of agreements), and admitting the partnership's limits.

Reeve and Hatter (no date) suggest a framework for understanding partnership building between public and private service providers in the United Kingdom in three stages: the vision stage, whereby partners map their interests in the light of existing opportunities; the action stage, whereby partners begin to collaborate and carry out joint activities; and the evolutionary stage, whereby the partnership adapts to changing realities. The tri-sector partnership building initiative in the United States (Warner 2003) suggests the existence of three phases: a first phase termed "partnership exploration" emphasizes helping the partners to evaluate costs, benefits, and risks and conduct explorative dialogue. The second phase "constructing the partnership" involves building trust among the partners, communicating effectively, negotiating around common interest, developing a common vision, establishing the structure for collaboration, attributing resources and roles, and building capacity for implementation. The last phase "partnership maintenance" concerns measuring results and impacts, adapting to external and internal changes, and communicating to constituencies, along with furthering institutionalization and growth or phasing out.

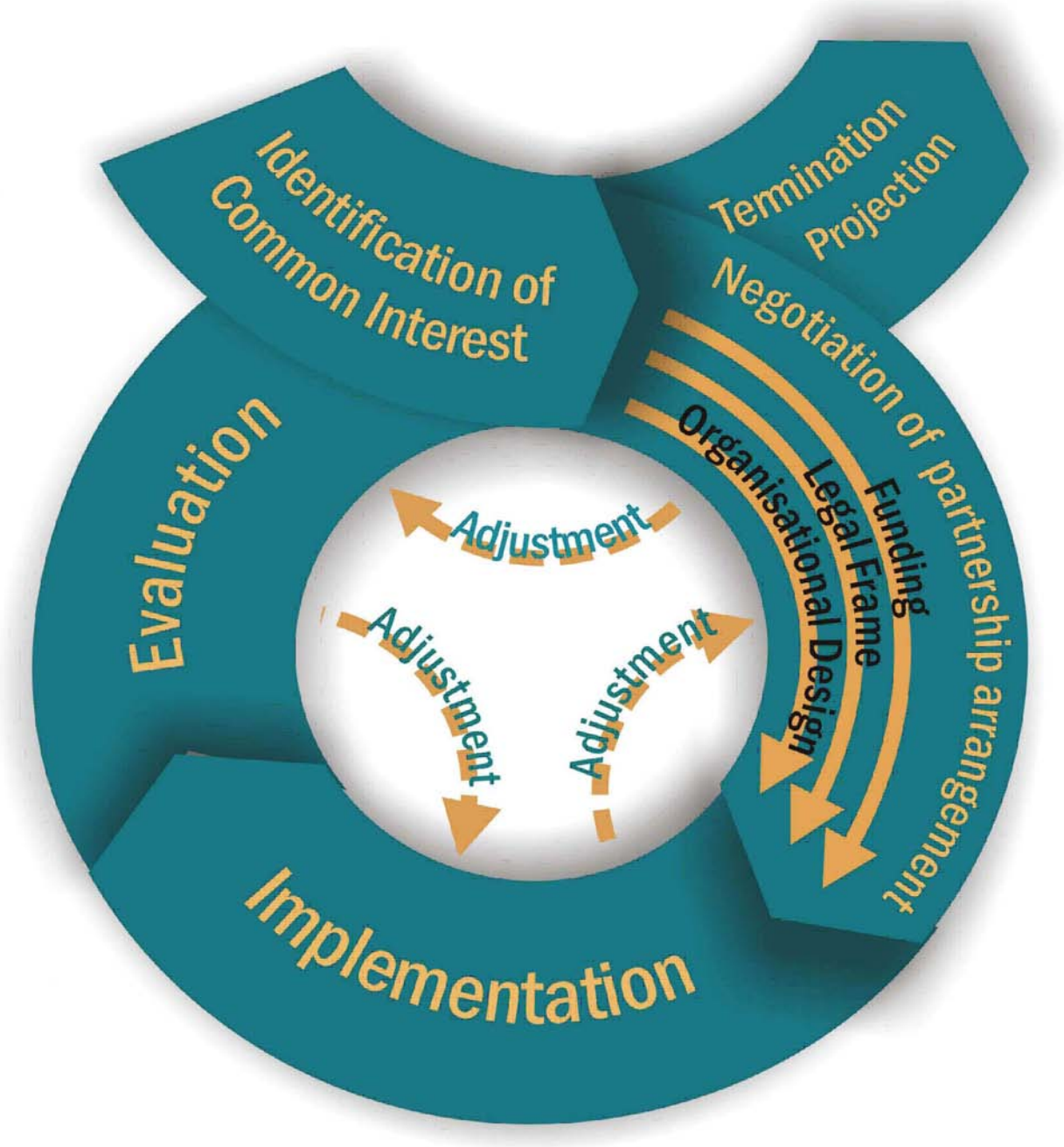
Other public–private partnership building initiatives have adopted a more detailed categorization of the process. The Global Alliance for Improved Nutrition (Tenyson 2003), for example, divides the partnering process into the following 12 phases:

1. scoping (that is, understanding the challenge, gathering information, consulting with stakeholders and resource providers, and building a vision);
2. identifying potential partners and motivate them;
3. building working relationships through agreed objectives and core principles;
4. planning the program of activities;
5. managing and exploring the optimal long-term structure of the partnership;
6. resourcing (including identifying and mobilizing cash and noncash resources);
7. implementing a pre-agreed timetable and work plan;
8. measuring and reporting on outputs, outcome, efficiency, effectiveness, and impact;
9. reviewing the impact of the partnership on the partners' organizations (during which time some partners may leave and others may join);
10. revising the partnership in light of experience;
11. institutionalizing and building appropriate structures and mechanisms for the partnership to ensure longer term commitment and continuity; and
12. sustaining or terminating the partnership.

For this study, we adopted a flexible and generic approach to understanding partnership building, distinguishing five main phases—identification of common interests and objectives, negotiation and

design, implementation, monitoring and evaluation, and termination or amplification—each of which is briefly described below (Figure 1).

Figure 1. The partnership-building cycle



Source: The authors.

1. *Identification of the common interest space.* This is an exploration phase that includes identifying common interests and achieving consensus regarding the problem to be solved through the partnership. Partners explore exactly what the partnership aims to do, as well as determine their own and their partners' interests. Partners also begin to look at the potential costs and benefits of the partnership, although these may remain unclear until the more concrete design phase.

2. *Negotiation and design of the partnership.* During this phase, the partners discover and negotiate the legal, financial, and governance framework for partnering. They agree on the scope of the partnership, configuring the partners' contributions in terms of fiscal and human inputs and deciding how benefits will be distributed. They also agree on the decisionmaking structures and management of day-to-day interactions once the partnership is up and running. Typically, objectives, activities, funding, governance, and distribution of benefits are manifested through some kind of partnership agreement or contract. Organizations often have little experience in negotiation, particularly in the public sector. Differing cultures and perspectives between public and private organizations can add to difficulties.

3. *Implementation.* Implementation starts with the partnership agreement, often at the signing of the partnership contract. Planned activities and commitments are then refined and agreed on, and the roles and responsibilities of the partners are established. In innovation partnerships it is often the case that researchers begin to design research activities, detailing inputs and evaluations by business partners. Private companies may also ensure that the underlying purpose of the R&D and the activities planned comply with their needs. However, this phase entails more than just implementing a plan; it also involves adjustments to changing internal and external conditions and challenges, which can lead to revisions to the design and configuration of the partnership.

4. *Monitoring and evaluation of achievements.* To assure the success of operations, it is important to monitor whether the partners' contributions match the agreed commitments. Further, it is important not only to evaluate the partnership against the expected results, but also to understand what other positive effects were generated. Evaluating results in terms of their usefulness to partners enables adjustments, redesign, and reconfiguration of the partnership. In some cases, the findings of the evaluation can result in a renegotiation of the partnership or the inclusion of new partners. The monitoring and evaluation process leads to change and evolution, which is essential for partnerships to maintain their relevance.

5. *Termination, revision or extension.* Once the anticipated duration of partnership activity concludes, partners have to make the decision as to whether to continue or end the partnership. This decision typically depends on whether the objectives have been achieved or whether they are likely to be achieved in the future. A continuation of the partnership is also opportune when there are promising new objectives to pursue, or when the scope of activities needs to be extended. Alternatively, if the objectives have been achieved, or partners determine that they cannot be achieved or can only be achieved at excessively high cost, the partnership may end. Nevertheless, systemized learning about the partnership may feed into new and other partnerships that employ new strategies and activities to solve similar or new technological problems.

Over time partnerships can profit from gradually improving work relationships and becoming more strategic. Otherwise, since partnerships are flexible arrangements and only a means to an end, they may simply be phased out. In any case, the process of building partnerships is not linear; at any time it may become necessary to return to an earlier step to implement adjustments. For example, during the negotiation and design phase, it may be necessary to return to the exploration and identification of common objectives, or during the implementation phase, it may be necessary to negotiate additional contributions to assure the successful achievement of expected outcomes.

3. CAPACITY STRENGTHENING FOR BUILDING PARTNERSHIPS

Strengthening the capacity of partners to design, implement, and nurture public–private partnerships can have positive effect on the functioning and performance of partnerships. To support this assumption and to provide the context for the analysis of capacity strengthening activities provided in the ensuing sections, some basic principles of capacity strengthening are reviewed in this section as they apply to innovation and public–private partnerships.

Improving capacity among those who lack knowledge and skill in partnering can support the process of partnership building. Traditionally, capacity strengthening has been a supply-driven process of transferring resources and skills—that is, training—to those who lack capacity. The agricultural research and technology transfer programs set up in many developing countries were primarily based on this paradigm (Engel and Salomon 2002). In contrast, the contemporary view of capacity strengthening or capacity building and development[2] emphasizes an overall system, environment, or context within which individuals, organizations, and societies operate, interact, and absorb new knowledge and skills. The United Nations Development Programme (UNDP), for example, defines capacity strengthening as "the process by which individuals, organizations, institutions and societies develop abilities (individually and collectively) to perform functions, solve problems, and set and achieve objectives" (UNDP 1997). UNDP views the analysis of capacity through a three-level framework:

1. *The individual level*: the skills and competencies of staff, and work ethics including human resource development (the process of equipping individuals with the understanding, skills, and access to information, knowledge, and training to enable them to perform effectively)

2. *The entity level*: an individual organization's structures and working mechanisms, its relationships with other relevant organizations, and its working and organizational development, including the elaboration of management structures, processes, and procedures not only within organizations, but also in the management of relationships among the different organizations and sectors (public, private, and community)

3. *The systems level:* the regulatory framework and enabling national and regional policies, including the development of institutional and legal frameworks and the modification of legal and regulatory mechanisms to enable organizations, institutions, and agencies at all levels and in all sectors to enhance their capacities

[2] Capacity strengthening, as distinct from capacity development or capacity building, implies that some relevant capacity already exists that can be strengthened.

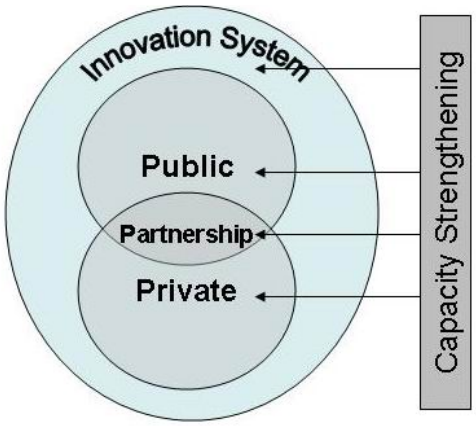
In addition, it is increasingly recognized that capacity strengthening is an endogenous process that is context specific and has to be driven by local needs (Schacter 2001). It involves attaining, strengthening, adopting, and maintaining capacity over time in response to emerging opportunities and challenges. Lusthaus, Adrien and Perstinger (1999) point out that Cacpacity strengthening has become central in many technical cooperation approaches complementing other thrusts such as institution building, institutional strengthening and human resource development. Some development organizations even take capacity strengthening as an overarching approach to development. Oxfam, for example, argues that strengthening people's capacity to determine their own values and priorities, and to act on these, is the basis of development (Eade 1997).

Some newer literature on capacity strengthening in urban development (Gittell and Vidal 1998) and natural resources management (for example, Australian Government 2004) connects capacity strengthening with the notion of social capital. Social capital can be defined as networks, partnerships, norms, and trust, which facilitate cooperation for mutual benefit. Capacity strengthening, in this context, can be seen as a dynamic process that focuses on developing and anticipating knowledge and skills in a collaborative process through which solutions are developed by target groups in response to existing capacities and demands.

In the field of business administration, Lawrence and Lorsch (1967), Leonard-Barton (1988), Powell (1990), and Leonard-Barton and Sinah (1993) emphasize that knowledge development requires integration and collaboration on the level of teams, groups, and systems. Szulanski (1996) further argues that in the absence of proper integrating mechanisms, knowledge may be "sticky," preventing efficient movement among agents even within the same firm. For the purpose of better collaboration, authors like Hughes (1994) and Garetty, Robertson, and Badham (2001) suggest that communities of practice as collaborative mechanisms between developers and users of technology are vital to success because they lead to "differentiation" (that is, gathering and developing knowledge from a variety of disciplines or other functional groups) and "integration" (that is, combining the knowledge from the various groups to generate further learning).

The argument that partnership building needs capacity strengthening also stems from the perception that partnerships do not emerge automatically in a way that makes them function appropriately. According to Vieira and Hartwich (2002), partnerships are built on the basis of common interest under the condition that they yield sufficient benefits for all partners to outweigh their cost. Capacity strengthening can be targeting toward the different partners and the identification of common interest (Figure 2).

Figure 2. Points of entry for capacity strengthening in public–private partnerships



Source*:* Authors.

The space of common interest is not always immediately apparent and often needs to be analyzed to reveal its potential. Here, a catalyzing agent or partnership broker can play a valuable role. Warner (2003), for example, argues that given the difficulties in negotiating the optimal division of roles between parties who may harbor mistrust, the role of brokers is sometimes pivotal to the early exploration and development of multi-sectoral partnerships. Partnership building can be promoted from within by one of the partners, but in situations where the partners are very different or the mutual benefits of the partnership are not obvious, a third-party broker is necessary.

Recent studies on the theory of national innovation systems argue that an innovation is not developed by a single agent in isolation, but rather in networks and partnerships of scholars and practitioners in the public and private sectors that bring together complementary knowledge and learning (see, for example, Lundvall 1988, 1992; Edquist 1997; Clark 2002; and Hall et al. 2004). Garetty, Robertson, and Badham (2001) stress the interorganizational dimension of capacity strengthening, arguing that capacities in the generation, dissemination, and adoption of innovations need to be based on collective activities through which people cooperate to make new technologies work.

Seen in an innovation systems context, capacity strengthening to build partnerships can target three different levels: the partners, their relationships, or the overall network or system.

1. At the *partner level*, capacity strengthening can focus on motivating and providing incentives, fostering leadership, improving relevant skill levels, and enhancing the ability of partners to maintain relationships, collaborate, and learn from each other.

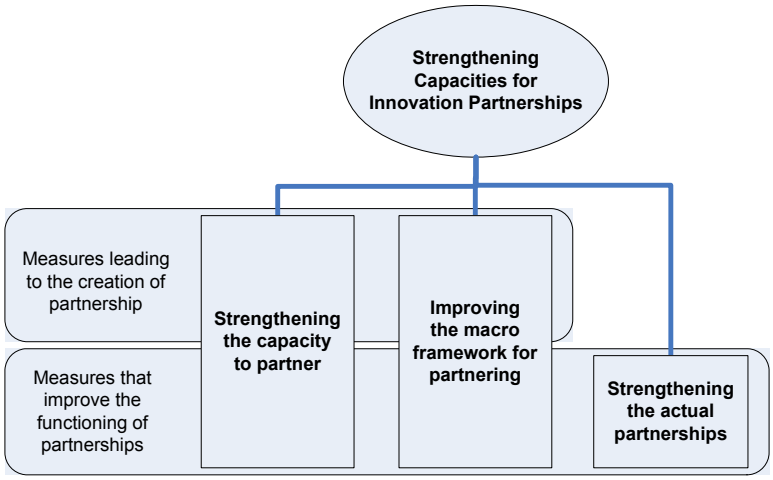
2. At the *relational level*, the linkages, partnerships, and networks that enable innovating agents to operate efficiently and effectively can be enhanced through capacity building focusing on

communication, negotiation, conflict resolution, and the development of social capital and trust.

3. At the *system level*, the capacity of decision- and policymakers can be developed as a foundation for improving the macro institutions, structures, policies, and rules that support the actions and interactions of innovating agents.

Figure 3 illustrates a framework for strengthening capacity in innovation partnerships. In addition to the categorization described above, capacity strengthening measures can be considered as those that lead to the creation of a partnership and those that enhance existing partnerships (Figure 3).

Figure 3. Elements of capacity strengthening of innovation partnerships



The necessary skills to partner and collaborate are not always well developed or understood, particularly in professional relationships. It is critical to the effectiveness and sustainability of many partnerships that partners learn to solve problems jointly and negotiate agreements without third-party brokers (Warner 2003). Nevertheless, partners are focused on a certain outcome based on their individual capacities (the partner level described above); they are not necessity skilled in partnering itself (the relational level described above). Further, facilitation (the system level described above) can substantially reduce the costs of interaction. Core capacities in building partnerships typically relate to the ability of the individual partners to interact with their counterparts despite different organizational culture, to negotiate commitments, understand the counterparts' interest and circumstances, communicate and share information, build trust, plan joint activities, effectively carry out common operations, and—ultimately—share benefits. For effective partnership development, skills are required in fields including project development, business planning, negotiation, governance and administration, legal issues, and financing.

Capacity strengthening in building partnerships for agricultural innovation is particularly cumbersome and complex because of the different actors involved (farmer groups and cooperatives,

public research organizations, extension agencies, and private small to large companies) and their diverse objectives. Public-sector organizations are different from their commercial counterparts in that they do not maximize profit and have fewer options for generating income. The private sector is generally motivated by short-term profit-maximization, while also aiming to increase market share, diversify products, and gain consumer confidence. The public sector, which promotes partnerships through funding and other support measures, is concerned with development goals, such as achieving economic growth, equity, food security, poverty reduction, and improved trade balances. Public research organizations act according to self-interest and objectives related to sustaining their research programs and advancing science and technology. Private-sector partners may be motivated to learn about development and social goals, farmers may need to learn to be business-oriented, and researchers may need to learn about being focused on the solution of problems.

Few case studies have been documented on strengthening capacity for collaboration and partnerships in agricultural innovation. The few works on partnerships in agriculture have described the partnership phenomenon and explained its advantages (for example, Hall et al. 2002). Gottret and Córdoba (2004) found that establishing collaborative research projects between public research organizations and private agents in poor rural environments in Latin America requires capacity strengthening beyond conventional project formulation and evaluation practices; they suggest intensive interactions in which joint learning between trainers and trainees can be achieved. In the field of commercial joint ventures in developed countries, El Sawy and Pauchant (1988) have argued that knowledge and information can be acquired either in a reactive mode, by copying specific knowledge-base decisions, or in a proactive mode, by scanning and monitoring the environment and integrating and discussing information, which depends on joint control, a collective purpose, and the exploration of complementary assets.

Based on experiences with building public–private partnerships for continued adult education in Germany, Deitmer (2004) suggests that partners should build capacities by establishing processes of self-evaluation in which they measure outputs, relevance and the likeliness that those outputs transform into impacts. The partners should then reflect on the results of the evaluation and discuss how to improve the performance of the partnership. A similar approach is undertaken by a joint initiative between the World Bank, the U.K. Department for International Development (DFID), CARE International, and the private sector to build tri-sector partnerships between governments, civil society, and petro-chemical and mining companies. The approach suggests building capacity among partners via participatory learning and workshops through which partners reflect on experiences (Warner 2003).

Overall the empirical evidence on how best to build capacity for innovation partnerships is thin. Most approaches suggest intensive interaction and joint learning mechanisms.

4. METHODOLOGY

Partnership building efforts can both promote the initial creation of a partnership and enhance an existing partnership's functioning. The present study dealt with the former putting emphasis on the process that culminates with the creation of the partnership in which case partners usually reach a verbal or written agreement (the partnership contract) about their commitments and a workplan. Seven cases were analyzed where project interventions supported partnership building. From January 2003 to June 2004, the project supported partnerships in broccoli and mango agri-chains in Ecuador and in plantain and coffee agri-chains in the Dominican Republic. In El Salvador, the project promoted partnerships in the loroco[3] agri-chain from July 2003 to June 2004, and in Costa Rica it focused on partnerships in the organic coffee agri-chain from during the same period and in the potato agri-chain from July to December 2004.

The project sought active participation by the various actors and government agencies involved in promoting the respective agri-chains and agricultural subsectors, including open communication, discussion, and consensus building. Activities were monitored concurrently for their effectiveness. Six activities were designed to foster the establishment of the partnerships that is, identifying common interest, negotiating terms, and designing the activities (Figure 4). This process included the following interventions:

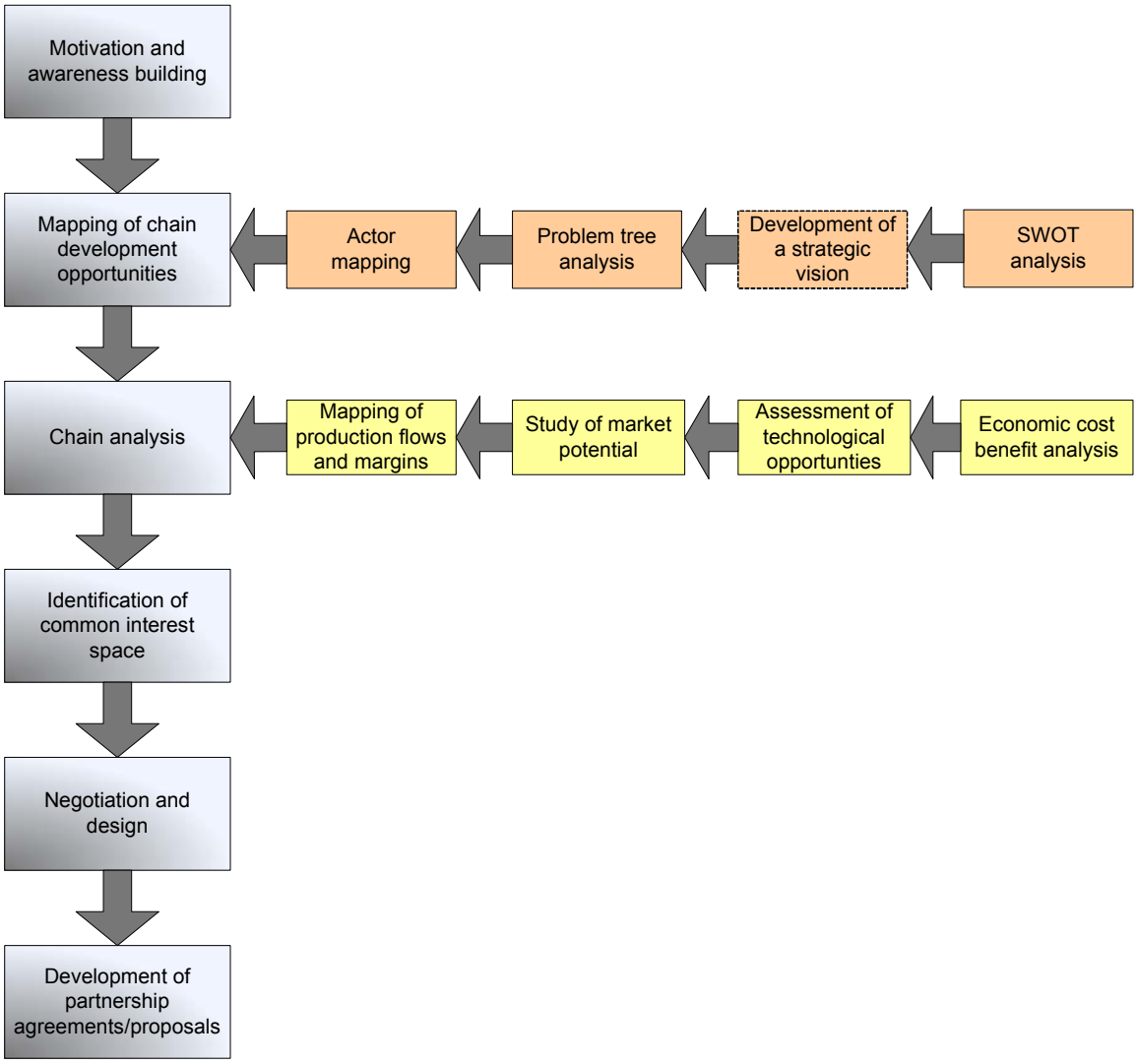
- *Motivation through "awareness building workshops."* All actors within the chain were asked to participate in these workshops. The goals and methodology of the partnership-building process were explained to potential partners who were then able to decide whether to participate on the basis of cost–benefit considerations.
- *Mapping agri-chain development opportunities.* A number of basic chain analysis tools were applied: (a) mapping actors in the chain; (b) analyzing problem trees for primary production, processing, marketing, and chain management; (c) developing a strategic vision for development of the agri-chain; and (d) analyzing strengths, weaknesses, opportunities and threats in the development of agricultural product-chains (SWOT analysis). These activities were initiated in a "chain development analysis workshop," in which only organizations that signaled potential interest in building partnerships participated.
- *Chain analysis:* Groups were formed among public and public–private research and extension agents, private-sector entities and producers, and public-sector promoting agencies to

[3] Loroco is the flower of a vein-like plant that is consumed as a vegetable, often to give flavor to the national maiz tortilla, the pupusa. Its use is limited to El Salvador, Guatemala, and Honduras, and communities of immigrants from Central America in the United States.

promote the partnerships. The groups (a) mapped the agri-chain with regard to production flows and margins, (b) studied market potentials, (c) assessed technological opportunities, and (d) conducted economic cost–benefit analyses.

- *Identification of common interests.* Partners were brought together in partnership planning workshops to reflect on their common interests. The results of the above chain analyses were shared with stakeholders in support of efforts to develop a common vision and exploit partnership opportunities among existing and potential partners.
- *Negotiation and design of partnerships.* Several meetings were held for the purpose of detailed negotiations as to how the partnership should be organized, including issues of organizational design and roles, responsibilities, commitments, and risk.
- *Support in the development of partnership agreements*. Support was given in the documentation of the above meetings to ensure that proposals were developed and formal agreements established. In all cases, partners sought additional external resources to complement the contributions of the partners.

Figure 4. Capacity Strengthening Measures for Partnership Building



Source: Authors.

The cases were chosen with the help of representatives from public research organizations and development agencies based on national priorities and need for innovation and collaboration. In Ecuador and the Dominican Republic, representatives from the public sector explicitly requested that the project provide capacity strengthening for the chosen cases. Representatives were asked to choose promising partnership-building scenarios on the basis of market opportunities, potential for technological improvement, and opportunities to create income for small- to medium-sized primary producers. The main actors in and objectives of those partnership-building cases are depicted in Table 1. Not all cases required that the various activities be applied to the same degree. The application of the various steps in the various cases is depicted in Table 2.

Table 1. Case studies on partnership development for agricultural innovation

Partnership details	Costa Rica		Ecuador		El Salvador	Dominican Republic	
	Organic coffee	**Potatoes**	**Broccoli**	**Mangos**	**Loroco**	**Coffee**	**Plantains**
Purpose of the partnership	Improved soil fertility management and use of organic fertilizers Improved integrated pest management Analysis to improve cost structures and income margins	Validation of industrial and fresh potato varieties with improved tolerance to pests/diseases Technologies to avoid losses in transport and storage Production costs and farm organization	Market and commercial information monitoring system for improved decisionmaking Integrated crop management Improved postharvest and commercial use of waste	Commercial validation and adjustment of new product development Integrated pest management for the control of the fruit fly Improving fertility management in mango cultivations Improving profitability by managing seasonality	Pest and Disease management Plantation management systems Processing and product storage	Improve coffee quality Improve the profitability of coffee production Added-value to small-scale coffee producers Diversification of production and development of environmental services	Improve productivity and quality in plantain production Development of postharvest and processing alternatives
Partners in research and extension	Coffee Research Centre (CICAFE) Centre for Agricultural Research and Higher Education (CATIE) Centre for Agronomic Research (CIA), University of Costa Rica National learning institute (INA) Education Cooperation for Costa Rican Development (CEDECO)	National Agricultural Technology Institute (INTA) Centre for Agronomic Research University of Costa Rica (CIA/UCR)	National Agricultural and Livestock Research Institute (INIAP) and CORPOINIAP *Escuela Politécnica Nacional* *Universidad Técnica de Ambato*	National Agricultural and Livestock Research Institute (INIAP) *Programa de Tecnología de Alimentos de la Escuela Politécnica del Litoral (ESPOL)* *Instituto de Investigación Tecnológicas de la Universidad de Guayaquil* *Centre de Cooperation Internationale en Recherche Agronomique pour le Developpment.* Fruit and Horticultural Crops (CIRAD FLHOR) *Servicio Ecuatoriano de Sanidad Agropecuaria (SESA)* *Instituto de la Potasa y Fósforo (INPOFOS)*	Faculty of Agricultural Sciences, University of El Salvador (FCCAA/UES) *Universidad Catholica* Centre for agricultural and forestry technology (CENTA) *Universidad Centroamericana José Simeón Cañas (UCA)* General Dirección for plant and animal sanity (DGSVA)	Dominican Institute for Agricultural and Forestry Research (IDIAF) Dominican Coffee Council (CODOCAFE) *Programa para el Mejoramiento de la Caficultura, para Centro América, Jamaica, Panamá, y República Dominicana, PROMECAFE* *Centro Agronómico Tropical de Investigación y Enseñanza (CATIE*)	Dominican Institute for Agricultural and Forestry Research (IDIAF) *Instituto para el Desarrollo del Noroeste, INDENOR*

Table 1. Continued.

Partnership details	Costa Rica		Ecuador		El Salvador	Dominican Republic	
	Organic coffee	**Potatoes**	**Broccoli**	**Mangos**	**Loroco**	**Coffee**	**Plantains**
Private-sector partners/ producers	Asociation of Organic Coffee Producer Familias (Alianza)	Association of Agricultural Producers Pacayas	Ecofroz S.A. Padecosa Brocoagro IQF Agroindustrial del Ecuador S.A	Mango Foundation Ecuador (FME) *Exofrut, Inversiones Agrícolas y Ganaderas Guayas S.A.*	Leading producers in the San Lorenzo zone Association of Suppliers of Agricultural Inputs (FERTICA)	Union of Northern Coffee Associations (UNACAFEN) *Federación de Caficultores de la Región Sur, FEDECARES* *Federación de Caficultores y Agricultores para el Desarrollo de San Juan de la Maguana del Suroeste, FECADEJS* *Asociación Dominicana de Cafés Especiales, ADOCAFES* *Américo Melo y Belarminio Ramírez e Hijos (toaster and exporter)*	FritoLay *Super-mercados Olé* *Asociaciones de productores (APAPE, Loa Conuquitos, Charco Blanco NO 1, Charco Blanco NO 2, ASOPROPA, ALHSR, de Regantes La Esperanza, de Regantes Mao y de Regantes José Cabreras)*
Government development agencies	Coffee Institute (ICAFE)	Ministry of Agriculture, National Potato Program	Corporation for Export and Investment Promotion of Ecuador (CORPEI)	Corporation for Export and Investment Promotion of Ecuador (CORPEI)		Centre for Agricultural and Forestry Development (CEDAF) *Secretaria de Estado de Agricultura (SEA)* *Secretaría de Estado de Medio Ambiente y Recursos Naturales*	Centre for Agricultural and Forestry Development (CEDAF) *Secretaria de Estado de Agricultura (SEA)*

Sources: Hartwich et al 2004b; Garza, Garza, and Hartwich 2003; Quiros et al 2004; authors.

Table 2. Measures applied in capacity strengthening

	Costa Rica		Ecuador		El Salvador	Dominican Republic	
Interventions	Organic coffee	Potatoes	Broccoli	Mango	Loroco	Coffee	Plantain
Motivation through awareness building workshops	X	X	X	X	X	X	X
Mapping of agri-chain development opportunities	X	X					
Chain analysis		Including analysis of economic benefits	Including the development of a vision	Including the development of a vision	Including the development of a vision	Including the development of a vision	Including the development of a vision
Identification of common interests	X	X	X	X	X	X	X
Negotiation and design	X	X	X	X	X	X	X
Development of partnership agreements		X	Project concept notes	Project concept notes		Project concept notes	Project concept notes

The methodology underpinning the analysis of the capacity strengthening exercises is based on action research, whereby the researcher temporarily becomes a part of the "community" being subjected to a certain intervention. While performing the intervention, the researcher also analyzes its effects and effectiveness (Foote-Whyte 1991). In the context of this study, action research refers to the study of activities implemented by the researchers to accelerate and improve partnership building. This approach allowed for intensive interaction with all the agents involved in the respective agri-chains and, in turn, the partnerships, expanding the possibilities for local problem solving. In analyzing capacity strengthening efforts under the project, cause and effect relationships were examined for each of the capacity strengthening measures presented in Figure 2 (Table 3).

Table 3: Capacity strengthening measures and their expected effects

Capacity strengthening measure	Expected result
Motivation through awareness building workshops	Potential partners actively engage in the planning and decisionmaking processes
Mapping of agri-chain development opportunities	Potential partners anticipate and analyze problems and threats that limit agri-chain competitiveness, as well as existing strengths, and opportunities for chain development
Chain analysis	Potential partners analyze the market chain and anticipate market opportunities, understanding the technological options available for pursuing business opportunities
Identification of common interests	Potential partners interact and articulate their interests
Negotiation and design	Potential partners negotiate the financial, governance, and legal aspects of the partnership and specify the commitment of resources and time
Development of partnership agreements	The partnership is formalized.

5. RESULTS

This section describes the lessons learned from the seven case studies previously described.

Motivation and Awareness Building

As a first step, the project teamed with public, private, or mixed organizations interested in innovation and production chain development to form national "promoter groups." Project staff promoted the concept of public–private partnerships to the group and later involved them in joint awareness-building activities to attract participation by public- and private-sector agents in the partnership building process.

In Ecuador, contacts were established with the National Agricultural Research Institute (INIAP) and its private-sector liaison offices (CorpoINIAP), and the Corporation for Export and Investment Promotion of Ecuador (CORPEI), a government body fostering competitiveness and value-chain development. In the Dominican Republic, the gradual involvement of the Dominican Institute for Agricultural and Forestry Research (IDIAF) was secured to motivate and build the awareness among potential partners. Given its primary focus on research, a more prominent role was subsequently adopted by the Dominican Center for Agricultural and Forestry Development (CEDAF), a parastatal that organizes project development. The role of parastatal sector development agencies was less prominent in Costa Rica where initial contacts were established with the University of Costa Rica (UCR) and the National Potato Chain Development Program of the Ministry of Agriculture. Costa Rica's National Coffee Institute, however, largely overlooked the initiative, which may in part explain why no partnership eventuated in that case (Box 1). In El Salvador, no public-sector development body was interested in becoming involved, so the project led the initiative in that country.

Box 1. Research on Organic Coffee Production: A Neglected Option for Public-Sector Development in Costa Rica

Costa Rica is a traditional coffee producing country, with coffee and bananas being the main income generating sectors in agriculture. The country's unique record in biodiversity and nature conservation provides incentives for producers and processors to apply environmentally friendly ecological standards to sell their coffee in high-value organic market segments, thus avoiding the use of agrochemicals and involving more environmentally friendly processing and waste management. The National Coffee Development Institute (ICAFE) and the National Coffee Research Institute, which are funded through export levies, have mainly focused their research efforts on nonecological coffee production. Few initiatives have supported organic producers, such as the Tropical Agricultural Research

and Higher Education Centre/German Agency for Technical Cooperation (CATIE/GTZ)–led project on conservation agriculture. Apart from such projects and the work of certain environmental NGOs, organic producers are left to conduct their own trials.

The project's partnership building activities brought together various stakeholders, initially at the agricultural sector level and later focusing specifically on coffee. Research and technology transfer organizations such as the University of Costa Rica, the National University, and GTZ/CATIE, as well as producer associations such as the Partnership of Organic Coffee Producing Families (ALIANZA), showed eager interest in the project. Engaging public-sector organizations, however, was more difficult. Apparently, producers and researcher see the need for innovation in organic coffee production more than public-sector administrators. The project's diagnostics generated detailed information on technological obstacles to organic coffee production, including soil fertility management, organic fertilizers, integrated pest management, and knowledge of cost structures and income margins. The diagnostics also pinpointed options for partnership design to address these problems in the light of export opportunities. Upon receiving the diagnostic results, research organizations and producers confirmed their interest engaging in the partnership; their commitment, however, was only in the form of in-kind contributions (that is, work time and use of experimental plots). It was expected that project funding would be derived from third parties. In the end, no funding solution could be identified. Producers, in particular, did not want to contribute funding because the coffee levy they pay already funds research conducted by ICAFE, even though that research is not related to organic coffee production. Further, no financial commitment could be elicited from the government. Eventually, the partnership failed to materialize, in part as a result of efforts by project staff to involve ICAFE, which decides how to allocate research funding for the coffee sector. In conclusion, in developing innovation partnerships for specific sectors, buy-in by a number of actors needs to be achieved. The question remains, however, as to what—if anything—could have been done to motivate ICAFE to participate in the partnership for innovation in organic coffee production.

The awareness building workshops were intended to address a broad range of actors in the respective agri-chains. A good number of participants in the first workshop ultimately did not participate in the partnership building activities (a development that can be considered as natural selection), but some representatives that did become involved did not attend the initial awareness building workshops. More carefully planned workshops, based on experience, could assure broader participation of agents, but missing out on the awareness-building phase did not hinder strongly motivated actors from participating at a later stage. In part, the later interest was prompted by the reputations of the members in the promoter groups, including the University of Costa Rica, which attracted private-sector entities because of its widely recognized expertise in genetic improvement of potatoes.

In all phases of partnership development, initial participation by the private sector was less prominent than participation by government and research organizations. Seemingly, private-sector agents are less accustomed to workshops and participatory consensus building exercises than public research and development agencies. When questioned about their limited commitment, private-sector representatives argued that innovation was only one of their concerns, and that sometimes they doubted the success of research initiatives.

The awareness building workshops in Ecuador and the Dominican Republic attracted many producers, technicians, and researchers, though, as in the case of Costa Rica the participatory approach was not valued in the private sector. In the case of the mango agri-chain, the promoter group decided to organize a second motivation workshop. While the second workshop achieved wider private-sector participation, a firm commitment could not be secured from private entities. Inability to clarify the initiative's objectives and communicate a strong message from the outset hindered these efforts.

In conclusion, it appears that in Ecuador and Dominican Republic the project made more substantial efforts to engage a wide range of agents. The promoter groups took over responsibility for motivating the process and inviting key actors to participate in the subsequent partnership building processes.

Mapping of Chain Development Opportunities

In a second step, diagnostic workshops where organized through which participants gained greater understanding of the roles played by various actors and how the agri-chain could be developed. The workshops also focused on the importance of knowledge and technologies, as well as coordination and information exchange in improving the competitiveness of agri-chains. Various methods were applied to sensitize participants to the positive effects of innovation partnerships, including the tools of mapping actors, analyzing problem trees, developing a strategic vision, and identifying bottlenecks and opportunities through SWOT analysis (see, also, Gottret and Lundy 2006).

Actor Mapping

Actor mapping involves identifying all actors in an agri-chain through participatory approaches and then categorizing them to reflect product flow from the producer to the consumer. The tool—a graphic representation of the actors, their positions, their relationship to other actors, and the associated product flow—enables the position and motives of each actor in the chain to be identified. It can also single out those in monopolistic and power positions and help to detail actors and institutions carrying market shares and thus exercising greater influence. This also assists in interpreting the interests, motives, and positions of actors on specific issues. The main purpose of the exercise is to promote discussion

among participants regarding types of actors, their roles in the chain, and marketing channels, all of which allows the group to analyze existing and alternative commercialization channels, bottlenecks, and opportunities for innovation in response to buyer demand. Such bottlenecks can then be further addressed through problem tree analysis.

Problem Tree Analysis

Problem tree analysis is a tool to identify solutions in development by mapping the causes and effects of a particular problem (Start and Hovlan 2004). It breaks down a problem into manageable and definable chunks, thereby facilitating a clearer understanding and prioritization of the causes of a problem. Problem tree analysis is best carried out in small focus groups using graphics. The first step is to discuss and agree on the problem or issue to be analyzed. The problem is then conceptualized as the "trunk" of a tree, and group members proceed to identify its causes as the roots and its consequences as the "branches." Importantly, factors can be added over time and the logic of the cause–effect relationship can constantly be revised. The heart of the exercise is the discussion, debate, and dialogue generated as factors are arranged and re-arranged, often forming subdividing roots and branches (similar to a mindmap).

In the study, problem tree analysis began with the problems identified through actor mapping. These problems usually related to certain innovation bottlenecks in the agri-chain, such as noncompliance with quality protocols, inefficiencies in production, or lack of knowledge of certain processing procedures. For each of these innovation bottlenecks, a problem tree was developed and discussed. At the end of the exercise, the problem was converted into an objectives tree through a process of rephrasing each of the problems as a positive desirable outcome. In this way, root causes and consequences were turned into solutions, providing entry points for action.

Developing a Strategic Vision for Chain Development

In Ecuador, El Salvador, and Dominican Republic, project staff realized that the agricultural value chains analyzed were lacking a vision in terms of their development, innovation needs, and the importance of improved competitiveness (Box 2). Efforts were therefore made to develop strategic visions by applying a future scenario tool that focuses on uncertainty and alternatives in the development of innovation opportunities (for a description of the tool see ISNAR 2002). The scenarios describe the conditions under which the agri-chain will have to compete in the future. They were constructed through a set of hypotheses about key variables in the external environment. The application of the tool, however, at times proved to be too technical for participants. As a result—for example in the cases of El Salvador

and in the Dominican Republic—the project team was left with the responsibility of developing the strategic vision.

Box 2. The Strategic Vision for the Ecuadorian Broccoli Chain

Ecuador continues to penetrate and consolidate efforts to market broccoli, improve its profitability, develop new markets for fresh broccoli, and developing new products. The agri-chain is well positioned in international markets, Ecuadorian Broccoli is known for its good quality. The chain is based on a sustainable production system, assuring its viability in the medium term, and it also benefits from a sector association that works toward continuous improvement of sector's competitiveness.

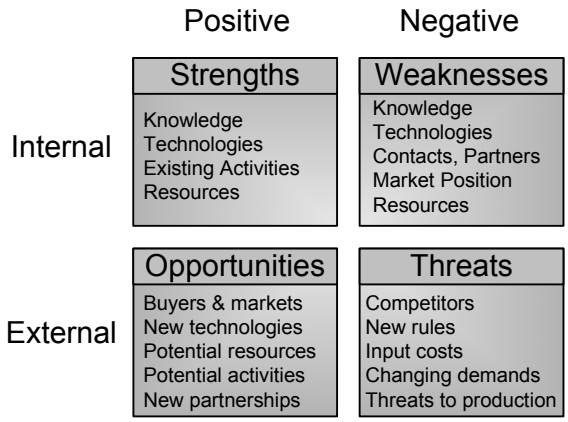
SWOT Analysis

SWOT analysis is a strategic planning tool, originally used in business administration, that assesses how a strategy can best be implemented by focusing on existing internal strengths and weaknesses and potential external opportunities and threats (Andrew 1971). Such analysis is best completed by a group of key members of an organization or, as in this case, an agri-chain. The point of departure for the analysis in this context was a discussion on the overall purpose of development of the agri-chain, which is usually related to the strategic vision for the development of the chain.

Once the main problems are clarified and agreed on, a brainstorming session begins following the SWOT framework (Figure 5). An assessment of existing knowledge, skills, activities, and resources helps in the identification of the main endogenous characteristics of the agri-chain and its actors. With regard to strengths in agri-chains it is useful to think about competences, competitiveness, and examples of success in cost reduction and market penetration. Weaknesses tend to be related to factors such as existing market position, deficiencies in contacts and partnerships, and knowledge and technologies being used.

In assessing the external environment, current and future conditions that could affect the agri-chain—either positively or negatively—are considered. For example, threats may occur from new competitors; changing demands for products; new market rules, such as input restrictions by buyer countries; changes in the input cost structure; and threats to production, such as from weather conditions, diseases, and infrastructural problems.

Figure 5. SWOT analysis in agri-chain development



Source: Authors.

It is often useful to rate or rank the most important strengths and weaknesses. In the workshops, participants individually assigned scores to the various issues. Results from the overall ranking were then jointly discussed with a view to possible actions or solutions. This process forms a useful complement to problem tree analysis because it more directly focuses on potential solutions and action.

The workshops gave participants a better understanding of key challenges in the development of their respective agri-chains. Nevertheless, participants still had difficulties conceptualizing how partnerships would help them solve challenges and take advantage of opportunities. Often, they could not see how they—as potential partners—could drive action. At that stage, the majority of participants expected that the initiative would be led by external donors, and that any action on their part would be for payment. Many private-sector agents, for example, perceive that it is the public sector's duty to provide research and innovation. Consequently, their willingness to contribute resources was limited. In fact, many had the expectation that if they participated in the partnership they would receive funding for their own purposes through the project or other donor and government sources.

The methods applied were at times unfamiliar to the participants. In some cases, the process of involving producers and processors was quite cumbersome, and some aspects of the analysis, particularly the SWOT analysis, had to be shortened. Nevertheless, the methods applied for chain mapping were a useful means of informing agri-chain participants of problem areas and opportunities for innovation. Further diagnosis, discussion, and awareness building was needed, however, to demonstrate the value of becoming involved in partnerships.

Chain Analysis

The chain mapping workshops were an entry point for participants in reflecting on innovation issues in agri-chains. The empirical evidence and robustness of the problems and opportunities identified required more in-depth diagnostic work, but since the project only provided marginal funds for in-country diagnostic work, the workshops were used to promote the various stages of the partnership building process. Hence the diagnostic work was left to national teams comprising representatives from research and government development agencies who received a small remuneration from the project. In Costa Rica and El Salvador, young scientists were contracted to help with data collection and analysis. Those teams generally generated very good results, although a stronger focus on expert and stakeholder consultation rather than formal analysis would have been preferable.

The diagnostics included four methods: mapping production flows and margins in the agri-chain, and studying market potential, technological opportunities, and economic surplus. These methods were applied in all studies with the exception of the economic surplus analysis, which was only applied in the case of the Costa Rican potato chain. A detailed description of the methods used is provided in the *Training Manual on Public–Private Partnerships* (ISNAR 2002); further details on the analyses have been published in Garza and Hartwich 2003, Quiros and Hartwich 2003, and Hartwich et al. 2004b.

Mapping Production Flows and Margins

In this study information on quantities of production, processing and trade was collected and mapped in a similar process to that described under *Actor Mapping*. The map basically shows the quantities transferred along the agri-chain and by whom. Further, information was collected on purchase and sales prices, together with approximations of average cost structures and profit margins for different types of actors in the chain. This was important for understanding where profits are made and who exercises power in the chain.

Studying Market Potential

The study also included an assessment of existing products and markets and an analysis of the potential to develop new products and markets and to diversify products and markets. The focus was not only on domestic, but also on export markets. The goal to enter into or expand market share in export markets, particularly in the Unites States, was a common feature in all cases. The existence of market opportunities alone, however, was insufficient to justify partnership building for innovation—technological opportunities were also needed (Box 3). The private partners that commit resources to a partnership need to generate benefit, such as lower costs, higher income, increasing sales, gaining of market shares, and so on.

Box 3. Good Market Against limited Technological Options: The Case of Partnership Building for Innovation in the Salvadorian Loroco Chain

Loroco is a native plant in Central America, which local populations consume in the form of fresh blossoms. For a long time, Loroco had only been found in wild form and in home gardens, but recently—given its local and export markets potential, especially with El Salvadorian emigrants in the United States—it has been cultivated in commercial plantations. Producers currently apply agronomic techniques that they developed by copying cultivation procedures from other vegetables, but they are searching for new and alternative production and processing technologies. Smaller farmers have access to few technologies given their high production costs; they also have fewer opportunities to reach markets. The National Centre of Technology in Agriculture (CENTA) has made efforts to systemize existing knowledge and technology in loroco production, but the information is still incomplete. Also, larger producers and processors have developed a technology package for production up to the point of sorting promising varieties and developing good agricultural practices and proper postharvest technology.

The project began to contact stakeholders in the loroco agri-chain in an important production zone, San Lorenzo in Ahuachapán. The region is characterized by low productivity, limited access to and use of farm technology, and long distances to markets. After an initial motivation and awareness workshop, the project initiated an in-depth analysis of market and technological opportunities for loroco (Garza and Hartwich 2003), including the mapping of the actors involved, the flows of product quantities, and the values and margins; developing a strategic vision for the chain using the balanced scorecard approach; identifying technology constraints using existing knowledge and progress; and validating technological options.

The two most promising innovation opportunities were developing storage technology and equipment to ensure the product meets quality standards, such as taste and texture, and developing integrated pest management technology and soil fertility measures leading to a manual of best practices for loroco production. Unfortunately, the initiative fell short in developing a concrete partnership proposal to pursue these issues because of the following problems:

- No reliable organizations could be identified to represent the interests and negotiate the partnership on behalf of producers in San Lorenzo.
- No public-sector agency showed interest in developing the agri-chain and no public-sector funding body could be identified to finance innovation activities in the chain.
- The capacity of small producers to engage in high-quality production, in terms of taste, freshness, and product appearance, was limited in the short run, and producers were unable to generate sufficient income to be able to contribute resources to the partnership.

- The overall value-added generated by the agri-chain is low compared with other crops, and investing in research for such small-scale production is unlikely to be economically viable. This situation could change, however, if exports to the United States were to increase substantially.

In essence, while substantial market opportunities exist, it is difficult to see how the technology opportunities for Loroco production could justify the high costs of R&D, particularly when the goal is to improve the economic situation of small-scale producers. Strengthening commercialization schemes may be a better option given the current circumstances. This does not mean that R&D for loroco production would not be beneficial, but perhaps it needs to be conducted by or at least led by the public sector with the participation of producers that already export to the United States.

Assessing Technology Opportunities

Assessing technology opportunities needs to be done by technicians who are able to estimate the potential benefits of innovations. Consequently, this study had to be carried out by experts with sufficient technical background to be able to draw sufficient conclusions via interviews and secondary sources of information. Technologies in primary production, processing, and commercialization were analyzed. The teams took the causes identified through the problem tree analysis as a starting point, and then collected further information on technological feasibility, yield potential, and the probability of success. This led to short reports providing substantial information to facilitate the development of project proposals.

Undertaking Economic Cost–Benefit Analysis

In the Costa Rican potato chain, CIAT's economic cost–benefit estimation model EVALEX (Reyes Hernández 2002) was applied to evaluate technology opportunities (see Hartwich, González, and Vieira 2005 for detailed results). The estimations illustrated both the value of innovation for the producers, and the associated costs of research and technology transfer, suggesting a high rate of return. These results finally attracted the attention of the public sector, but, even so, it was unable to mobilize any funding.

An attempt was also made to use the International Food Policy Research Institute's Agricultural Research Impact Assessment Model, DREAM (Wood and Baitx 1998), which was designed to evaluate the effects of agricultural research on consumers and producers ex post. Much of the data had to be estimated, do, so the results of the model were questionable.

In general, the economic surplus evaluation contributed to the understanding of the economic benefits of the proposed partnerships. This information was relevant to the partnership promoters, and especially so to the project staff. Understanding the relationship between the likely investments required

by the different partners and potential benefits to be achieved (and by whom), was crucial in the process of pursuing partnership options. Also, public administrators in the relevant ministries found the results useful and were happy to consider the value of the partnerships, despite the lack of accuracy. The private-sector entities also found the results interesting, although they misinterpreted the results to be a measure of their individual benefits rather than the overall economic surplus. In sum, the economic surplus approach is not a sufficient means of convincing partners and the government sector to commit to partnerships for innovation. Other approaches, such as trust in the partner, market and technology opportunities, and options for co-financing may be equally or even more important in the decisionmaking process.

The results of the four types of diagnostics described above were presented for discussion and validation to chain actors by the multidisciplinary teams. Further input was generated in a partnership formation workshop. The participants of those workshops had usually participated in the awareness creation and chain mapping workshops and were interested in further pursuing partnership building. These workshops were crucial in providing convincing arguments for participation to potential partners. Participants from the private and public sectors anticipated the presented results, but only some individuals in the study teams learned how to generate such results on their own. Without the input of the project, no studies would have been conducted.

Overall, it was found that the four methods applied were important foundational steps in pursuing potential partnerships. Given the analysis, agri-chain actors interested in forming partnerships from early on in the process now have relevant data to support their arguments for partnering. Others that previously saw no value in becoming engaged now see the opportunities to innovate. Those who only saw in the partnership an opportunity to profit from somebody else's investment learned about the need and potential to innovate, as well as the importance of engaging a number of actors in such an initiative. They also came to see the value in committing to the initiative themselves. Despite the limited scale on which the diagnostics were carried out (the project invested no more than US$2,000 in consultancy fees per diagnostic for each agri-chain), which at times called the data and results into question, the results had an important impact on negotiations.

During the diagnostic exercise, the private entities emphasized their interest in technology solutions associated with reducing costs and increasing marketing opportunities. In those situations, the project team sometimes had difficulties explaining that the benefits of research and innovation only arise in the medium to long term. Private-sector entities were less apt to participate in the diagnostics than other activities, despite being very interested in the diagnostic results. This exacerbated problems with the analysis because companies did not share data, even though it was nonconfidential.

Formulating Common Interests

The previous steps described—awareness building and motivation, mapping of opportunities, and chain analysis—as well as the later phase of negotiation can all be considered part of a wider effort to identify common interest. Based on the information compiled in the workshops and studies, actors were expected to be able to anticipate the likely benefits of their involvement in a certain innovation activity and, hence, mark their interest. The difficulty was in conveying that the type of promising innovations that result from the diagnostics need to be developed through a formal partnership agreement. This point was addressed at the above-mentioned partnership formulation workshop, which emphasized the pressing need for innovation; the need to share costs, competencies, and responsibilities; and the advantages of joint learning and technology development. Participation in these workshops was at times reduced as in the case of the mango chain in Ecuador and the potato chain in Costa Rica, partly due to workshop fatigue, or it increasing with time as in the case of broccoli chain in Ecuador and the coffee chain in the Dominican Republic. To this end, the leadership of public and private institutions, as opposed to just the project, was crucial to successfully formulating common interests (Box 4).

Box 4. Leadership Helps to Improve Trust Among Researchers, the Private Sector, and the Public Sector: The Case of Broccoli in Ecuador

Ecuador produces broccoli for the off-season U.S. market in particular and, to a lesser extent, for Japan and Europe. Profit margins are high, but production and transport risks are also considerable because buyers not only demand high quality, but also have nontrade barriers based on production and processing practices.

In the beginning, the project solicited the interest and commitment of the Ecuadorian Export and Investment Corporation (CORPEI), a public-sector development agency and the company ECOFROZ, a large broccoli producer that also processes and buys from small-, medium-, and large-scale producers. ECOFROZ is a market leader in rapid freezing of broccoli for export. Other agro-industries—namely PROVEFRUT, VALLEZ Foods, and PADECOSA-IQF—and a large-scale producer, BROCOAGRO, subsequently joined the initiative. Small- and medium-sized broccoli producers were somehow left out because no representative producer organization could be identified. The only participant in the field of R&D was the national agricultural research organization, INIAP, which specialized in agronomy and farm technology, but not necessarily vegetable production. Other institutes, universities, and colleges were found to be unable to provide sufficient technical service on R&D issues.

The partnership-building efforts and analyses led to the identification of three viable topics for pursuing innovation: (a) Establishing a market intelligence system to provide information on prices, market opportunities, and competitiveness benchmarking; (b) making advances in integrated crop

management; and (c) improving postharvest and waste management. The initiative led to the formulation of three proposals that at first did not attract a donor. After some adjustments, two of the three projects were successfully implemented with the support of public donors from Ecuador and a substantial private-sector contribution.

CORPEI's role in the process of partnership buildings evolved gradually, from participating in the workshops and conducting a study on market opportunities, to providing leadership and promotion through continuous bi-lateral motivation and follow-up with the various partners. The partnership planning workshop and meetings thus benefited from a promoter with a public mandate for chain development. Under CORPEI's leadership, motivation and trust among the partners gradually developed. Leadership was also provided by the private company ECOFROZ, making the initiative more credible in the eyes of other private-sector actors. The leadership of CORPEI, however, was not sufficient to motivate greater financial commitment from the private sector.

In conclusion, this case study underlines the importance of leadership and promotion from both the public and private sectors in motivating potential partners and building trust to the extent that they engage in serious discussions on partnering.

Based on the information elicited through the workshop diagnostics, R&D objectives and areas of common interest were clarified and validated. Actors could then reflect on whether they profited from the prospective technology innovations and whether they were able to contribute. Through this process, the fit among participants and topics became clear, thereby illuminating the potential for partnering. Insights were also gained as to which organizations could develop, provide, and disseminate the necessary knowledge and technologies. This resulted in a portfolio of projects and potential organizations that could collaborate to achieve project results and objectives.

These projects were then further negotiated at separate meetings involving potential partners only. The discussions centered on possible project outputs, distribution of benefits, and required commitments. The positive outcome of these meetings often depended on the existence of some sort of leadership among the participants, whereby one actor would convince the others of the value of becoming involved. One problem was that some of the pivotal partners were not present at the workshops and subsequent meetings, which had implications later on, particularly for private-sector agents who had to be re-contacted for the further negotiations.

Negotiation

Once topics and potential partners were defined, negotiations began regarding the kinds of inputs required and who could provide them. Such inputs included physical, financial, and human resources. Table 4 summarizes the outputs of such negotiations for the case of the Ecuadorian mango chain.

Table 4. Budget plan for partnerships on fruit fly research in the Ecuadorian mango sector (1,000 U.S. dollars)

Type of resource	Public research agent (INIAP and Agricultural Sanitation Service)	Public sector and donor to be identified	Private sector agent (Ecuadorian Mango Foundation)	Total
Human resources	42	68	30	140
Physical resources, equipment, and materials	11	15	1,400	1,426
Financial resources	30	73	0	103
Total	83	156	1,430	1,669

It is important that all in-kind contributions are accounted for in order to have a sound basis for negotiations. Partners usually prefer in-kind contributions, such as employee time and use of existing infrastructure and services (Box 5). Given the prevalence of in-kind contributions by partners, the implementation of partnerships depended on the involvement of a donor to provide funding. A special issue occurred in the case of the broccoli chain, in that one actor had already conducted previous research, and it was not clear how the initial investments associated with that research should be included. When calls for compensation were made, two private-sector companies left the negotiation.

Box 5. Developing Partnerships for Innovation in Mango Production and Processing in Ecuador: Limited Commitment of Private Sector

Mango production in Ecuador is for export, especially to the United States, where off-season and tropical market segments are targeted. Mango production in Ecuador is carried out in the Pacific lowlands by small- to medium-scale producers. The first step by the project was to engage producer associations and private-sector companies. Eventually, the Ecuadorian Mango Foundation (*Fundación Mango de Ecuador* [FME]) came to represent the private sector. FME packages and exports fresh mangos in particular. The diagnostic phase of the mango agri-chain, however, was carried out without private-sector participation.

The diagnostics revealed that producers had difficulties meeting the quality and sanitization standards imposed by international buyers, which have zero tolerance for fruit fly contamination, for

example. As a result, wastage is high for exports to northern countries, and the product can only be sold as second- or third-grade on local and regional markets. The diagnostics also showed that Asian and Latin American countries, including Peru and Colombia, expand their harvesting season which shrinks the possibilities of off-season marketing for Ecuadorian mango. Ecuador's National Agricultural Research Institute, INIAP, is attempting to manipulate flowering to expand the harvest season and shift it to an earlier time in order to take advantage of off-season prices, which are higher, though this research is still ongoing. For the rest of the year, Ecuador now faces crude competition from highly organized fruit sectors in neighboring and Asian countries. Diagnostics in the processing sector showed that third-grade mango, aside from being sold in local or regional markets, is also processed to add-value as juice and other products. INIAP, together with *Centre de Cooperation Internationale en Recherche Agronomique pour le Developpment* and Fruit and Horticultural Crops (CIRAD–FHLOR), had been researching new ways of processing mangos and developed a range of options needing commercial validation, which required the involvement of the fruit processing industry.

In the subsequent planning and analysis, four main topics for innovation were identified:

- validating newly developed product alternatives for commercial use,
- improving the profitability of mango production by manipulating the timing of flowering,
- integrating pest management for the control of the fruit fly, and
- improving fertility management in mango cultivations.

These four areas of research and innovation constitute opportunities for public–private partnerships involving researchers, producers, and technicians working in postharvest in the private sector. Building the partnership was jeopardized, however, by lack of decisionmaking power on the part of FME. In practice, the decisionmaking power remained with executives of FME's member companies, who were not sufficiently involved in the imitative to appreciate the benefits of the partnership. As CORPEI's expertise lies in marketing and the analysis of competitiveness as opposed to technology, this agency was not in a position to promote the proposed partnership to the private sector.

In the end, the exercise led to the development of four proposals worth US$850,000. Of this amount, 47 percent was to be funded by partners and the remaining 53 percent was to be generated from external sources. The private sector was only willing to contribute 10 percent of the total investment, most of which (70 percent) was to be provided by EXOFRUT for new product development. All the proposals were negotiated with national and international donors, and funding was eventually secured for the initiative to manage seasonality from the Food and Agriculture Organization of the United Nations (FAO). This project is now being implemented. The initiative on

new product development in processed mangos—despite the commitment of EXOFRUIT, INIAP, and CIRAD–FHLOR—has as yet been unsuccessful in attracting external funding, in part due to limited private-sector commitment and the low priority many international cooperation projects and regional innovation funds give to the postharvest sector.

Negotiations not only centered on funding issues, but also on organizational design, responsibilities, administration, decisionmaking, and reporting in the partnership. The redistribution of benefits was also discussed, although the topics proposed in the seven agri-chains left little doubt about how each actor would benefit. Many projects focused, for example, on improved farming practices, pest management, and quality protocols. Issues of property rights, related for example to plant varietal research, were not at stake in the partnerships and therefore no particular negotiations on this subject were necessary. The future development of processing technology in the partnerships in Ecuador and El Salvador may lead to patentable results that would then require some re-negotiation. To date, such discussions have not featured in partner negotiations.

The access to information generated through the partnership was, at times, a source of heated debate. In the case of the mango sector in Ecuador, private companies claimed that only the partners should receive the information, while public agencies advocated further dissemination of the information to the whole chain. In the Ecuadorian broccoli chain, one partnership suggested an information system that required information sharing among the different chain actors. Private companies unused to public good arguments fiercely contested open access even though it would improve competitiveness of the chain. Competition was feared from neighboring producers more than from competitors on the world market.

It was quickly discovered that, in addition to the initial workshops, separate follow-up discussions, meetings, phone calls, and informal conversations were an important means of generating interest and achieving commitment. One final meeting involving all the partners was finally organized. Once again, leadership was extremely important. In some cases, an independent facilitator—that is, a government agency not directly involved in the partnership but promoting and guiding its establishment—was involved. In other cases, the independent facilitator demonstrated weak leadership so one or more other partners became the primary drivers (Box 6). Also important, however, is the role of a private-sector partner that is able to convince other private entities of the value of the partnership.

Box 6. Lack of facilitation:
The Case of Building Partnerships in the Plantain Chain in the Dominican Republic

Plantain production is an important economic activity for many of the small-scale farmers in the Dominican Republic. The product is sold on the local market but is also increasingly attracting the interest of U.S. buyers if export quality standards are met. The diagnostics of the agri-chain revealed that productivity is generally low, given inadequate crop management practices that result in a high incidence of Sigatoka Negra. Additionally, the seasonality of production results in high price fluctuations and the risk of income losses. Little information is available on crop management, and the training and technical assistance provided by the government extension service and NGOs is inadequate. Most importantly, the technical constraints are limited availability of good quality planting material; susceptibility of local clones to pest and diseases, particularly Sigatoka Negra; low planting densities, and inadequate soil and subterranean water management practices.

The project began with the partnership building process in collaboration with the Dominican Center for Agricultural and Forestry Development (CEDAF). CEDAF primarily took the role of an observer and facilitator, assisting in the organization of workshops and meetings and inviting chain actors to the workshops. Lack of experience of both the partnership concept and the tools and methods applied prevented CEDAF from taking a more prominent leadership role in the process. Consequently, the Dominican Institute for Agricultural and Forestry Research (IDIAF)—which is already assigned to conduct the research identified through the partnership process—took on the additional role of facilitator. The role of a facilitator, however, is rather best undertaken by a neutral organization that is not a direct partner.

Complications arose when producer organizations representing the interests of many private producers were absent. Various producer organizations operated at the local level, at times with diverse and contradictory objectives and interests for the development of the agri-chain. The costs of negotiation increased substantially when attempts where made to include these organizations in the negotiations, and eventually some of them ceased to attend the planning workshops.

Development of Partnership Agreements

Partnership design and negotiation is formalized with the development of a concept note or a proposal specifying objectives, outputs, and activities. There are unique differences between the proposals of traditional projects and of those of public–private partnerships. Traditional research and extension projects are designed to facilitate access to private, public, and donor funding, not to promote

collaboration. Partnership proposals are different in that they explicitly include mechanisms to support interaction and joint learning among partners with a view to creating synergies and generating innovations. Further, partnership proposals need to reflect the outcomes of the negotiation with regard to each actor's agreed contributions. The proposal should also factor in monitoring and evaluation mechanisms that assure compliance and take changing circumstances into account.

It is not always easy for partners to reach consensus in formalizing a concept note (Box 6). Experience from the project shows that partners only commit when the agreement includes complementary funding from a donor. The project team therefore focused on developing generic concept notes that could subsequently be tailored to the specifications of donor agencies.

Box 7. Importance of formulating a concrete project: The Case of Building Innovation Partnerships in the Costa Rican Potato Chain

The Costa Rican potato chain faces challenges in remaining competitive and maintaining the quality and sanitization standard of its potato products. Costa Rica seems to have lost competitiveness in the emerging market for French fries. The sector uses large quantities of agricultural inputs, especially agrochemicals, and due to market protection over a number of years has faced little pressure to reduce costs—unlike its competitors in Colombia, Guatemala, and North America. Nevertheless, the country remains among the few Central American countries with appropriate conditions for producing potatoes and exporting them to neighboring countries.

Some leading producers, seed companies, and processors of chips, along with some retailers, are concerned that without innovative responses to outdated production schemes and processing technology the future competitiveness of the sector is in jeopardy. Under the leadership of an agronomic research institute from the University of Costa Rica and the national potato chain program of the Ministry of Agriculture, efforts have been made to improve the competitiveness of the sector, with mixed results.

In this situation the project organized a national workshop with the intention of raising awareness among all actors in the sector as to the importance of technology innovation. Two main fields of interest arose from the discussions: the evaluation and selection of promising seed varieties for industrial and fresh potato use, and research on agronomic practices to improve on cost structures and gross margins.

Two institutions, the National Agricultural Technology Institute (INTA) and the Centre for Agronomic Research of the University of Costa Rica (CIA/UCR), were able to offer capacities to develop solutions on these issues. They were willing to participate in a partnership if third party

funding was identified. The negotiations led to a proposal under which the two organizations would carry out joint research, seed producers and processors would apply and test the researched technologies, and a fund for R&D would bear the majority of the costs. However, an inability to develop a common vision for the development of the sector—largely stemming misunderstandings, particular interests of the research organizations, and limited commitment on behalf of private-sector participants—jeopardized the partnerships building process. It was only by developing a project proposal that the two research organizations were able to agree on a plan of activities. Lack of an association to sufficiently represent all the producer interests was another obstacle to attracting private-sector partners.

In conclusion, the initiative reached the status of project formulation, but to date has failed to attract donors. The development of a concrete proposal was helpful, it was not enough to overcome the disparate interests of the partners.

As of 2005, the project's activities have led to the formation of 19 partnership proposals and concept notes (two to three per agri-chain). The proposal quality was generally high because they were rooted in in-depth analysis of market and technology opportunities in the given agri-chain contexts, emphasizing strong partnering among research and technology transfer agents and the private sector. Not all proposals attracted third party funding, however. This may be less a reflection of deficiencies in the proposals and more an indication of the highly competitive and bureaucratic processes of funding agencies. The proposals were usually oriented toward the donors' general development criteria. They were particularly strong with regard to user participation. However, the various grants and funding opportunities come with specific objectives and priorities, and these are not necessarily in accord with the market and technology opportunities. Funding agencies did not always appreciate that wide stakeholder consultation, significant analysis, and complexity of issues underlying the partnership proposals; rather, they were satisfied with a technically sound proposal by a single researcher.

Nevertheless, given the sound participatory analysis undertaken, it is likely that the innovation issues identified will be followed up by those involved in the initial process. The project contributed value not only by developing the proposals, but also by strengthening the capacity of the partners and others involved to instigate and participate in partnerships in the future.

6. DISCUSSION

Several lessons emerged from the case studies presented above (Table 5). Some difficulties were encountered during the **awareness creation and motivation** phase, mainly because it was not easy, at this initial stage, to identify and attract all relevant actors in the agri-chain that needed to be involved in future partnership building. Also, the project had some problems in communicating the right message to attract the interest of actors, who were focused on gaining benefits for themselves or their organizations. Over time and with carefully planning, clear messages were communicated to all invited stakeholders about the purpose and advantages of partnership building, resulting in greater success.

The project's **chain mapping** exercises, mainly carried out in form of diagnostic workshops, were successful throughout. Participants were highly appreciative of the opportunity to diagnose their respective agri-chains through group exercises. This may be a more common response among less formally developed agri-chains, which were the focus of the project. In more developed agri-chains, participatory chain analysis may at times be redundant because actors have already participated in such exercises. The main factors leading to the success of the Caín mapping exercise were the choice of the simplest methods (actor mapping, problem tree analysis, vision development, and SWOT analysis), avoidance of unduly complicating the exercises, and providing good facilitation at the workshops.

The **chain analysis** was carried out by national teams with support from project staff; the resulting reports varied in quality. In Ecuador, the national teams contracted consultants to carry out the task, applying less rigorous methodologies. Nevertheless, the expertise of the project staff in chain analysis was essential to guide the work. While the participation by the private sector was not necessary, the supply of private-sector information was necessary to the analysis. Further success factors in the conduct of the study were the provision of some financial incentives and rigorous data collection.

The results of the agri-chain analysis were presented in partnership planning workshops with a view to **formulating common interests** among potential partners. Problems occurred in attempting to solicit the participation of all the relevant actors, and certain important potential partners—particularly in the private sector—actually stayed away from the workshops. In these cases, other means of communication were used to facilitate communication among potential partners. To this end, creating awareness via telephone and meetings was effective. This step was one of the most difficult ones because conflicts and roadblocks frequently occurred. Factors such as clarity in the results from the chain analysis, leadership on the part of a private-sector partner, and promotion through a third-party public-sector body all contributed to the successful identification of the common interest.

Table 5. Success of partnership building activities

Activity	Organic coffee	Potatoes	Broccoli	Mangos	Loroco	Coffee	Plantains
Motivation and awareness building	Unsuccessful	Unsuccessful	Successful, but poor private-sector participation	Initial success, failure due to poorly organized follow-up	Successful	Successful	Successful
Mapping of agri-chain development opportunities	Successful	Successful	Successful	Successful	Successfull	Successful	Successful
Chain analysis	Successful, high-quality report	Successful, high-quality report	Successful, low-quality report	Successful, low-quality report	Successful, medium-quality report	Successful, medium-quality report	Successful, medium-quality report
Identification of common interests	Unsuccessful	Successful	Successful in some areas (integrated pest management), in other not (post harvest management and processing)	Successful only in some areas (manipulation of flowering and new product development)	Successful in some areas	Unsuccessful	Successful in some areas (new market opportunities)
Negotiation and design	Unsuccessful	Unsuccessful	Successful	Successful	Successful	Successful	Successful
Development of partnership agreements	Unsuccessful	Successful	Successful	Successful	Successful	Successful	Successful
Proposal developed and funded	0 of 2	1 of 3	0 of 3	1 of 4 (two have been adjusted and resubmitted elsewhere)	0 of 2	2 of 3	2 of 3

In the **negotiation** and partnership design phases, the main problem was that potential partners only wanted to commit in-kind rather than finance resources to the partnership. This meant that funding had to be sought from donors or governments. The negotiations revealed that partners were motivated to become involved in partnerships in order to receive third party funding; the prospect of joint innovation development was actually minor. As a result, continuous lobbying from the leaders of the partnership and the public-sector promotion organizations was needed to achieve even minor agreement.

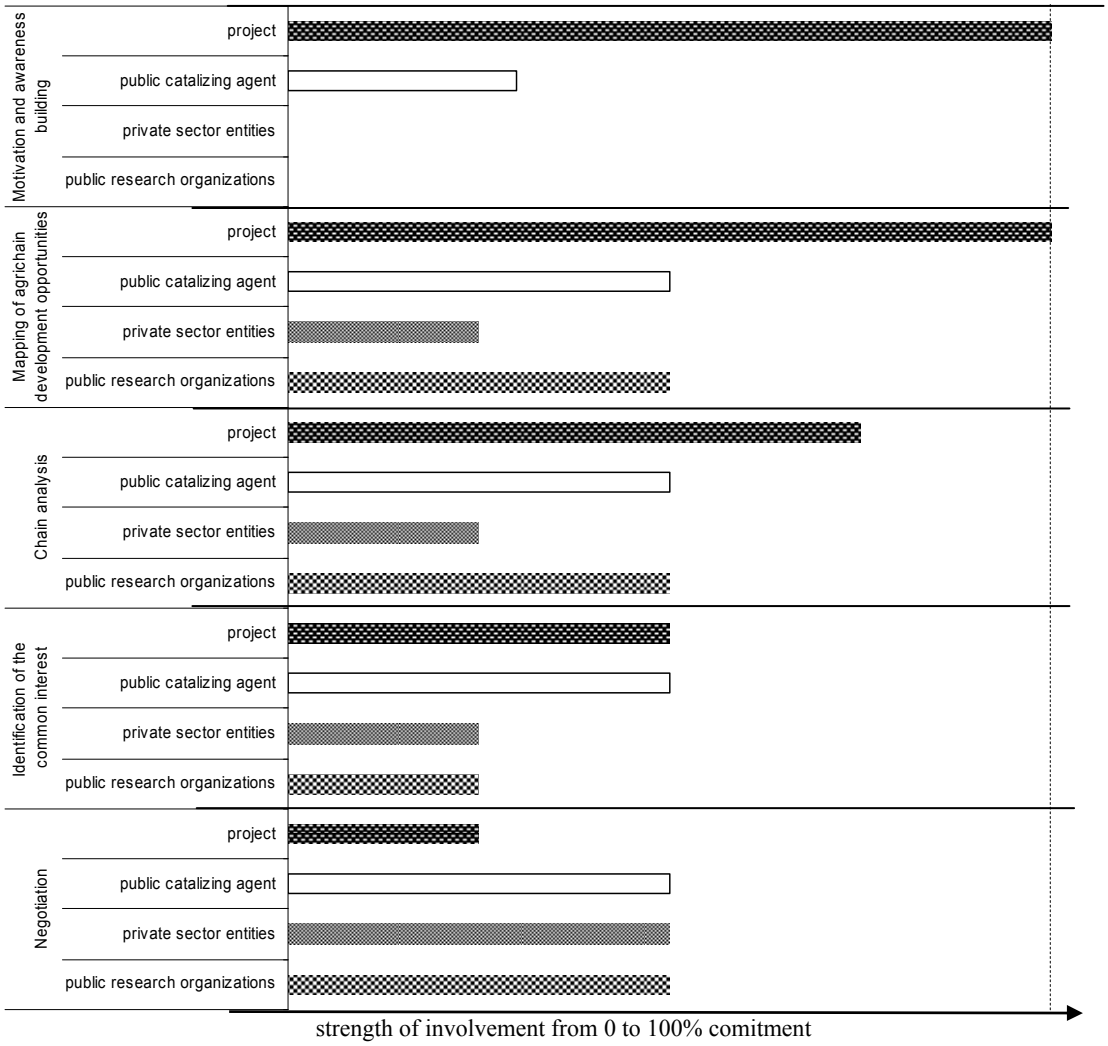
Negotiations regarding the design of the partnership, especially in terms of organizational structure and the workplan, were easier in cases where the chain analysis diagnostics had led to formal project proposals. Often it was the research partner leading the operations, and the negotiations focused on how private-sector entities could participate and contribute. Negotiations were particularly difficult when partner representation was unclear. For example, an association of agro-processing companies became involved in negotiations, but decisions on funding were the responsibility of company directors who were not present at the workshops and meetings. In other cases, it was difficult to include various local associations because of their conflicting objectives and varying commitment.

At the point of **developing the partnership agreement,** 19 proposals were written, each soliciting complementary funding from external donors. As of 2006, six proposals had been funded. Again, the main factors in the successful development and approval of partnership agreements were sound diagnostic analysis and leadership.

Overall, the partnership building activities were positive. Success did, however, depend on the efforts of the project team rather than the partners, making the project a critical catalyzing agent. Equally important was the role of promoters and catalyzing agents in the public sector, such as CORPEI in Ecuador and CEDAF in the Dominican Republic. Their input was crucial, particularly to partnership building, which confirms the findings of Hartwich, González, and Vieira (2005) in an ex post analysis of established partnerships across Latin America who found that external promotion in the initial phase is essential to the creation of partnerships. A gradual shift in leadership, from the project to the public-sector development agencies, took place over time as the partnerships developed.

In addition to the external promotion agents, leaders within the partnership itself were also important. Such leaders can come from the private sector or from research and technology transfer institutions. They usually have a broader vision regarding the development of the sector, region or innovation in question and can exercise a certain influence with other agents, often because of their existing credibility. Figure 6 depicts the changing roles of the various agents involved in the partnerships studies.

Figure 6. Evolution of the roles of agents in partnership building



It can be seen from Figure 6 that the project exercised leadership in many of the initial partnership building activities. As the partnership evolve, intervention by the project team became less important because the public catalyzing agent took over this role. Nevertheless, these catalyzing agents still needed the guidance of the project team and would not have been able to foster the creation of partnerships on their own. Overall, there is a clear indication that partnership building may not easily be achieved in the absence of external agents.

Private-sector leadership has been weak in all the cases studied. Often the sectors did not dispose of strong private producers or processing companies that could exercise leadership. This was the case in the less developed organic coffee chain in Costa Rica, the plantain and coffee chains in the Dominican Republic, and especially in the rudimentary loroco chain in El Salvador. The mango, broccoli, and potato

sectors, however, involve many prosperous companies, but they generally failed to see the value of collaboration.

The public-sector research organizations participating in the cases studied at times faced funding obstacles; mismanagement; and lack of capacity, human resources, facilities, service orientation, anticipation of private-sector needs, and motivation. These weaknesses may have contributed to the organizations' focus on funding rather than collaboration. The University of Costa Rica, IDIAF, and INIAP all took on leadership roles in partnerships within which they would be the primary R&D service providers.

7. CONCLUSION

Public–private partnerships for innovation are justified when addressing a problem or capitalizing on an opportunity that requires collective action or pooling innovative capacity. Through partnerships, more social and private benefits can be generated, given that all partners articulate their needs in the planning and negotiation processes and jointly commit to provide financial and human resources.

Capacity strengthening in partnership building can lead to more viable partnerships that take social and development needs into account. However, capacities for partnership cannot be developed as an ad-hoc effort, it requires promotion via catalyzing agents and the active participation of partners. An understanding of what partnering involves is not usually an explicitly learned skill. As such, learning partnering skills can be a costly and time-consuming process that may not necessarily result in immediate and tangible benefits. The study's results also show that partnerships cannot be established as a quick fix; partners do not respond effectively to capacity strengthening when it is pressured or hurried.

The experience in facilitating the partnering process in the seven cases studied prompts six main conclusions:

1. Capacity strengthening in partnership building is specific to the value chains and actors it involves. The value chain is an appropriate context for analyzing opportunities for innovation in areas of common interests that can best be exploited through public–private collaboration.
2. Capacity strengthening for partnership building goes beyond traditional training to include horizontal learning among the partners; it a continuous process that does not suit a one-size fits all approach and requires that needs be identified taking all partners into consideration.
3. Determining when to enter into a partnership depends on the partners analytical skills and the information available on technological and market opportunities; participation in diagnostic exercises strengthen the capacity of partners to enter into present and future partnerships.
4. Choice of appropriate capacity strengthening measures depends on the level of cohesion already achieved among the potential partners; for example, awareness building may not be necessary if talks about potential collaboration are already occurring. The possible entry points for partnership building measures need to be considered to enable common themes and objectives to be identified. The "chain mapping exercise," for example, provides opportunities for key stakeholders and partners to be identified.
5. Strengthening partnership-building capacity should predominantly focus on identifying and exploring common interests among potential partners through a variety of tools that help clarify interests in terms of technology development, production, and sales. If partners do not become seriously interested in pursuing the partnership, they will not attach the necessary importance to

the planning of the partnership. Third-party catalyzing agents are necessary to bring partners together, motivate them, provide information, and organize space for negotiations.

6. It is important to have at least one visionary leader among the partners, be it in the private sector or in the public research community. The leader supplies the capacity for sectoral analysis in partnership and can help to clarify and communicate the advantages and gains the partnership offers. The leader is also important in motivating and attracting potential partners. The internal leader may also eventually take over the initiative from the external promoter. However, a gradual process of shifting leadership from the external catalyst to the internal leader is the most successful option.

Finally, it is important to ensure the participation of decisionmaking hierarchies in partnership building efforts if all the work to develop the partnership is to come to fruition in final negotiations, commitments, and signed agreements.

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