

Agricultural Clusters

Florian Theus, World Bank Institute

Douglas Zeng, World Bank

SYNOPSIS

A cluster-based approach helps to identify policy and institutional impediments to competitiveness and innovation. Through dialogues at the cluster level, new partnerships can be forged between cluster leaders and various public organizations (such as those working on industrial development, infrastructure development, research, innovation, and training) to formulate and expedite policy reforms. Given that developing countries have very limited financial resources, selectivity and efficacy are important guiding principles of competitiveness strategies. Focusing on a cluster approach mirrors these principles, helps in scaling up to the industry level, and fosters regional innovation systems. A government may choose to pursue cluster initiatives along with simultaneous policy reforms, because the two approaches may create positive externalities and help government develop a compelling case for policy reform. Based on a broad range of successful cases, the most important factors in the success of a cluster program or initiative appear to be demanding markets, positive joint action, and institutions capable of moderating and focusing power imbalances—complemented by the push factors of education and prior technological knowledge. Perhaps most important from a policy perspective is the ability to adopt flexible and coevolving policies designed to foster cluster emergence, which reflect the development of institutions, technologies, and firms in a dynamic and self-organizing process. It is critical to find a balance between carrying capacities, the institutional setup, and the individual incentive design.

CLUSTERS AND THE RATIONALE FOR INVESTING IN THEM

The cluster approach focuses on networks of production and value chains rather than on nationwide initiatives to

foster innovation. Clusters are agglomerations or networks of production populated by strongly interdependent firms (including specialized suppliers) within a value-adding production chain as well as service providers and associated institutions in a particular field. In some cases, clusters also encompass strategic alliances with universities, research institutes, knowledge-intensive business services, bridging institutions (brokers, consultants), and customers. These entities are linked by externalities and complementarities and are usually located near each other. Agricultural clusters often form geographic and sectoral agglomerations of enterprises (Schmitz 1992). The most dynamic clusters spring up spontaneously, without direct intervention by external actors.

Why and when to use a cluster approach

Cluster-based policy aims at removing the imperfections of innovation systems by enabling them to function more efficiently and avoid coordination failures. A cluster-based approach is a realistic way to identify the policy and institutional impediments to competitiveness and innovation. When a critical mass of firms moves simultaneously to function as an initial cluster, they become an effective vehicle for catalyzing reform. Through dialogues at the cluster level, new partnerships can be forged between cluster leaders and various public organizations (such as those working on industrial development, infrastructure development, research, innovation, and training) to formulate, effectively sequence, and expedite policy reforms.¹ A government may choose to pursue cluster initiatives along with simultaneous policy reforms, because the two approaches may create positive externalities and help government develop a compelling case for policy reform.

The cluster perspective provides a number of advantages over the traditional sectoral approach in both analyzing and promoting competitiveness, innovation, and innovation

networks. Given that developing countries have very limited financial resources, selectivity and efficacy are important guiding principles of competitiveness strategies. Focusing on a cluster approach mirrors these principles, helps in scaling up to the industry level, and fosters regional innovation systems. A value chain may be too narrow a domain when the surrounding innovation ecosystem is underdeveloped. On the other hand, the national innovation system may be too broad a domain, and its top-down approach (unlike the bottom-up approach possible with a cluster strategy, discussed in “Lessons Learned”) would increase the risk of making mistakes on a large scale.

Clusters versus value chains

While a value chain approach² can be used in the absence of a cluster approach, *value chains must be supported for a cluster approach to work*. Cluster development and value chain enhancement must go hand in hand if a cluster aims to promote innovation-based competitiveness in developing countries, where (1) value chains are often very unstructured throughout their segments (transportation, distribution, enabling environment), thus requiring intervention by numerous stakeholders who cannot resolve these problems alone; (2) trust among stakeholders is weak, and a special effort is needed to build social capital; and (3) obstacles need to be addressed by multiple stakeholders and value chain segments (USAID 2008).

Spontaneous versus orchestrated clusters

The most dynamic clusters spring up spontaneously, without direct intervention by external actors (McCormick and Mittulah 2005). On the other hand, agricultural clusters in developing countries may be fostered by local and/or national government as well as donor support.

In supporting the transformation of clusters into innovation systems, evidence points to the importance of complementary policies, programs, and financial mechanisms that can foster new linkages and create opportunities for sustained growth. Where these links and opportunities are not established, stagnation and decline in the face of crisis and challenges often followed (Zeng 2010). Regulatory frameworks and extension agencies also play important roles in agricultural cluster development.

It is obvious that cluster development is a long-term, multifaceted approach that is unsuited to short-term investment projects. External support is often provided during later phases of cluster development, when clusters have demonstrated their potential.

ENABLING INVESTMENTS TO SUPPORT AGRICULTURAL CLUSTERS

The cluster approach involves many actors whose roles are always evolving, which makes the role of the state complex and location specific. Roles of the public and private sectors are becoming increasingly blurred. The private sector in many developing countries is providing quasi-public goods, such as training smallholders in the use of technology, instituting quality control, or providing finance (Larsen, Kim, and Theus 2009). Cooperation and collaboration schemes have been implemented in virtually all spheres that originally might have been the domain of the public sector (see the discussion of PPPs later in this note).

Three broad areas of investment are commonly needed to support the development of agricultural clusters. They include investment in infrastructure and the policy environment, investment in a regulatory framework, and investment in formal and informal institutions (and their coordination).

Importance of improved infrastructure and policy environment

Cluster programs and investments are effective only where minimum conditions of macroeconomic and physical stability, hard and soft infrastructure for doing business, and basic institutions for supply-side functions are met. Government plays an important role in this regard, often supported by donors. Economic reforms such as deregulation of domestic markets, removal of explicit and implicit trade barriers, ending distortions in exchange rates and taxation, as well as the development of a sound property rights regime are some of the measures that need to be taken. For instance, the Kenyan cut flower cluster succeeded owing to the enactment of legislation setting up promotional schemes (such as manufacturing under bond, export compensation, and export promotion zones for horticultural exports), protecting intellectual property rights, and enforcing quality standards (Zeng 2010). The public good character of infrastructure—especially the transport, hygiene, and cooling facilities critically important for many food products—makes government and donor involvement imperative.

Regulations, quality assurance, and standards

Local governments often try to improve services and regulations in ways that help to generate business, enable clusters to operate normally, and maintain dynamic growth. In addition, governments enact specific regulations, especially

related to types of investments, product quality, and standards to ensure that products made in clusters have a market future.

Persistent capacity constraints can cause standards and quality management regimes to fall short of implementation, however. Targeted assistance to governments has proven successful in removing this constraint. In the Ugandan fish cluster, the government provided leadership and coordination to develop local standards and, through its fisheries inspection service, regular monitoring. The development and enforcement of standards helped sustain the pressure on the clusters to keep up with improved process-related standards (the same could be done for product upgrading) (Kiggundu 2005).

The crucial role of institutions

Institutions are crucial in agricultural clusters (figure 5.2). They may be public (state agencies, regional entities on competitiveness and innovation, and educational institutions, among others) or private (banks, business organizations, and companies) and formal or informal (networks, learning through transactions with local and external agents, and so on).

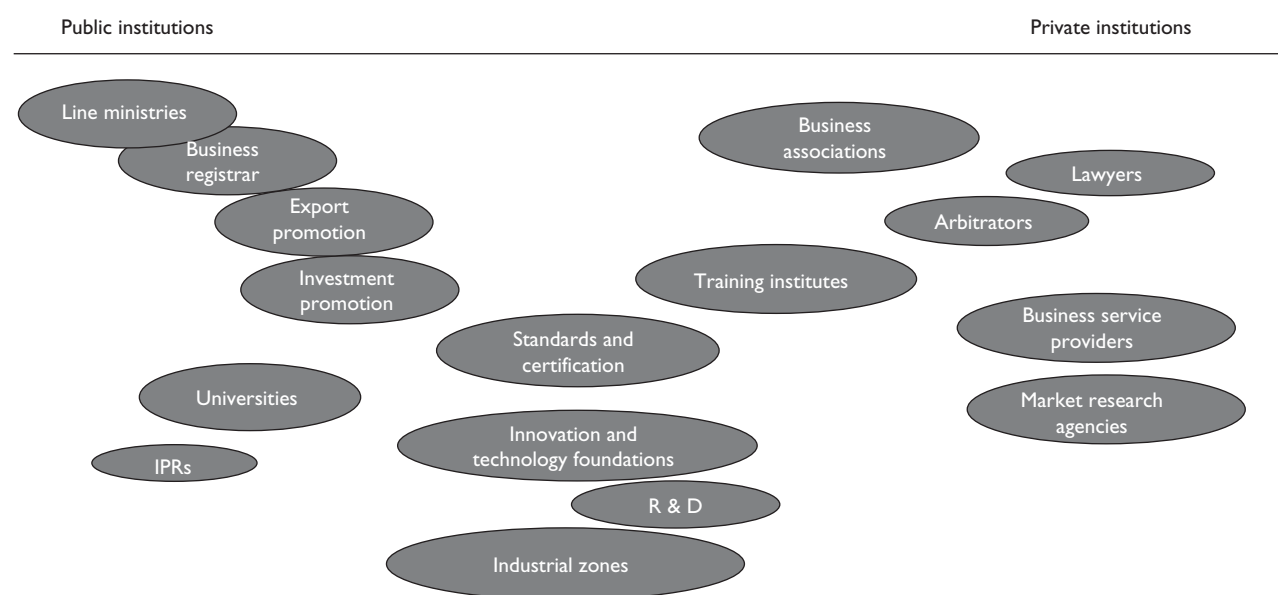
GENERATING AND ACCESSING FINANCIAL RESOURCES. Throughout developing countries, the lack of financial

services forestalls process and product upgrading and cluster development. The high risks, uncertainty of collateral, informality of many SMEs, and high transaction costs limit financial services in rural areas. Where financial services are available, banks often provide expensive credit under stringent repayment schedules. Financing innovators and startups becomes extremely difficult under these conditions.

Developing capacity in financial service providers as well as their cluster clients (firms) can be an important step in reducing information asymmetries and risk. Banks benefit from capacity building to improve credit checks. Firms, on the other hand, benefit from expertise in developing business plans. The list of mobilizing co-investments may include commercial bank financing, equity financing, development bank financing, an industry tax or levy, venture capital investment, government investment, and voluntary industry investments³ (see the discussion in TN 6 on risk capital). The approach should factor in the consideration that venture capital, as cases such as Silicon Valley show, generally lags behind cluster formation. Venture capital firms are attracted to new clusters once they show substantial economic activity with the expectation of future profits (Braunerhjelm and Feldman 2007).

LEARNING AND TRAINING. Various industry-specific modes of learning and training—formal and informal—are

Figure 5.2 Institutions with Crucial Roles in Agricultural Clusters



Source: World Bank 2009.

important means of acquiring and disseminating knowledge and technology in clusters, because they influence the clusters' potential for innovation and competitiveness. Modes of learning and training generally include: apprenticeship, on-site training at suppliers' factories, on-the-job training, expert contracting, support mechanisms provided by public institutions, learning through transactions with local and external agents, and learning-by-doing in the areas of production and maintenance (Zeng 2006).

On-the-job-training, a major mode of learning for high-tech-intense clusters, is often absent or insufficient in agro-clusters in developing countries. Support programs for training institutes, expert contracting, and training of masters are means to strengthen training and learning capacity. For example, in the South African wine cluster, capacity was improved through the newly created Elsenburg Training Institute, with vineyards and a cellar. Most established producers exchanged production knowledge through this institute, which performed a function similar to viticulture forums and root stock associations (Wood and Kaplan 2006). (See box 5.22.)

Governments can also strengthen major educational institutions to meet cluster needs. A critical element of curriculum design is to foster links with the private sector so that the skills of graduates meet the agribusiness requirements of the cluster (see examples in module 2). The same point applies to research institutes and universities involved in R&D: They need to focus on applied research and areas of prime importance for the respective cluster. Finally, location is key to cluster development. As major sources of technology and knowledge spillovers, as well as technology commercialization, agricultural universities and possibly their incubators are major sites of innovation and thus significant for cluster development.

INSTITUTIONS OF TECHNOLOGY TRANSFER, KNOWLEDGE GENERATION, AND SHARING. Progress in technology, innovation, and product diversity are linked to institutions of technology transfer, knowledge generation, and sharing, mostly supplied or supported by the public sector or by donors (TN 5). A prime example of best practice and long-term development of such institutions is Fundación Chile, the key institution enabling technology transfer to Chile's renewable natural resource clusters. Fundación Chile started out as a specialized service provider and began to incubate companies to nurture a demonstration effect for new technologies (see module 1, IAP 3).

INSTITUTION(S) FOR COORDINATION AND STRATEGY. Nurturing a coordinating body may be important. Forming competitive clusters requires collaboration among multiple levels of government, companies, teaching and research institutions, service providers, standard-setting bodies, and private organizations. A strong coordinating body, usually a public agency, is needed for that role. Through unambiguous policy and with the involvement of all relevant actors, a national competent authority on technological upgrading may provide leadership in organizing background research across carefully selected sectors, developing standards and performance targets for technological change, and developing reward systems and support and enforcement mechanisms. An example is the South African Wine and Brandy Company, which was formed to represent the local wine industry cluster and to implement the vision of innovation-driven and market-oriented production and exporting of wine. After restructuring, it incorporated divisions focusing on basic and applied research, international market development, and social and political transformation (Wood and Kaplan 2006).

POTENTIAL BENEFITS

Evidence from rural industry clusters in the United States shows that clusters contribute positively to regional economic growth and higher wages for rural workers (Henry and Drabenstott 1996; Gibbs and Bernat 1997). Because of their proximity, cluster constituents enjoy the economic benefits of several location-specific externalities and synergies. A well-developed concentration of related agribusiness spurs three important activities:

- **Increased productivity** (through specialized inputs, access to information, synergies, and access to public goods).
- **More rapid innovation** (through cooperative research and competitive striving). Nothing sparks productive innovation better than competition in proximity—whether technological innovation, as seen in the IT clusters of Bangalore or Korea, or creative innovation, as in the fashion design clusters in New York and Paris.
- **New business formation** (filling in niches and expanding the boundaries of the cluster map). In clusters, new businesses form as a consequence of competition, demand for services, and the attraction of investors; this dynamic in turn spurs innovation.

The cluster and its location-specific externalities and synergies accrue a range of benefits:

- **Better and more efficient access to infrastructure, specialized human resources, and inputs, including capital.** Firms readily obtain access to vital inputs such as suppliers, information, technology, financing institutions, and institutions of higher education.
- **Reduction of costs.** Transaction costs are considerably lowered because of proximity in the cluster. Proximity offers vital advantages for the agricultural sector in developing countries, in particular for SMEs. Often firms can source products and services from inside the cluster and forgo the (greater) cost of having to develop or produce the product or service. Costs are also being reduced through economies of scale and scope, as in the case of joint marketing and bulk purchasing. Costs related to hiring talented employees are reduced as well, provided talent is made available in the cluster.
- **Access to information and services.** Being in a cluster provides members with preferred access to extensive market, technical, and competitive information that accumulates in the cluster. For example, through a close relationship with sophisticated buyers within a cluster, suppliers are more attuned to their specific needs. Business organizations and also business fairs function as information and service hubs; informal day-to-day contact with similar companies plays an equally important role.
- **Attraction of foreign investment.** If clusters are leading centers for their industries, they will attract all the key players from home and abroad. In fact, foreign-owned companies can enhance the leadership of the cluster and contribute to its upgrading, as experienced in the Ugandan fish cluster where this function was played by European firms.
- **Better recognition and marketing.** For small and developing businesses, locating in a cluster near competitors and related industries may help them to grow, gain recognition, and attain status more rapidly within the market. The South African wine cluster is indicative. Only when a company was established to market wine for a pool of producers did they gain the clout to export and market on a large scale. One producer alone could not have done it.

One cluster often seeds or enhances others as it disperses activities in the value chain to reduce risk, access cheaper inputs, or better serve particular regional markets. Export-oriented clusters usually generate above-average wages,

productivity, and innovation.⁴ The South African wine cluster demonstrates those benefits and shows how the development of a cluster can spur innovation and economic growth in an industry (box 5.22).

POLICY ISSUES

With regard to agricultural cluster projects, the most prominent policy issues concern power imbalances, social and environmental issues, as well as a need to define public versus private sector roles.

Some actors in clusters and innovation systems, such as SMEs and their associations, can encounter enormous difficulties in trying to grow (Parrilli 2006). The strongest agents use the market to maintain control over resources and decision-making and invest in innovative and costly activities (such as R&D or promotion campaigns) that strengthen their position compared to weaker competitors. Leaders are needed for a cluster, but programs and projects need to guarantee equal opportunity of access and competition with a view to sustaining the cluster. The commercial interests of a cluster can infringe upon local communities and their way of life, leading to social tensions and hampering the cluster's prospects. For example, social tensions with local residents erupted after cut flower farms privatized the public beaches used for public recreation around Lake Naivasha (Bolo 2006). Horticulturists and fishers around the lake have come into conflict over diminishing fish numbers (Bolo 2006) (box 5.23). Potential externalities have to be factored into policies and programs and should reflect the interests of all potential stakeholders.

Clusters whose productive processes rely heavily on natural resources encounter challenges arising from their side-effects on the production base, growth, or changing environmental conditions (such as climate change). At the onset it is difficult to predict the size, concentration, and output a cluster might attain, but the environmental implications can be severe (box 5.23). A common analytical tool is an environmental impact study. Scenario-based forecasting is an additional tool to hedge against the potential problems outlined in an impact study (see module 7, TN 3). A specific challenge to agriculture relates to common-pool resources, in which exclusion of beneficiaries through physical and institutional means is especially costly and exploitation by one user reduces the availability of the resource for others (Ostrom et al. 1999).

Box 5.22 The Wine Cluster in South Africa: Outcomes and Success Factors

The South African wine industry has grown significantly since the early 1990s in an extremely competitive global market. Exports rose from 20 to 177 million liters between 1992 and 2002. Over the same period, table wine production increased by 33 percent. This phenomenal change came about through a combination of institutional, structural, and market factors.

Two policy initiatives underlay the wine cluster's success. First, the abolition of the quota system precipitated a shift toward varieties for which global demand was increasing. Incentives promoted extensive new planting and replanting. In 2002, 37 percent of vineyards were less than eight years old, and grape quality had increased. Second, broad macroeconomic policies aided the growth of the cluster, including the liberalization of agricultural trade, deregulation, land reforms, reduction of direct subsidies, and the introduction of a minimum wage for farmers.

South Africa's wine producers can be divided into four segments: established producers, new producers, cooperative producers, and wholesalers (some of which produce wine in addition to their primary role of marketing, sales, and distribution). Technical support came from the Agricultural Research Council (ARC), which is partially funded by the state. The Wine Industry Network for Expertise and Technology (Winetech) plays

Source: Wood and Kaplan 2006.

a key coordinating role as the hub of an extensive network of industry actors and scientists and technicians from the universities and ARC. Winetech serves as an advisory council to the South African Wine and Brandy Company (SAWB), a nonprofit company that represents wine producers, workers, and wholesalers. It has an explicit commitment to enhance the competitiveness of every aspect of the industry through innovation. SAWB designated the private organization Wines of South Africa (WOSA) to act on behalf of some 320 South African wine exporters to promote South African wines internationally. The competitive realities of the global market reinforced the roles of SAWB and WOSA, because marketing the country's brands had become too big of a job for individual firms.

Greater cooperation and collaboration among producers and other institutions increased innovation and helped to overcome market imperfections and inefficiencies. Innovation altered marketing, wine-making processes, the choice of varieties, and production practices. Producers exchange knowledge through viticultural and vinicultural forums, a root-stock association, two varietal associations, Winetech, and the Elsenburg Training Institute. Extensive use of local and international consultants and information about international market trends was a key component of success.

Box 5.23 Environmental Challenges for Cluster Development: Examples from Kenya and Tanzania

Kenya cut flower industry (a scale challenge). Kenya's cut flower industry needs water, but the extent to which the cluster around Lake Naivasha would evolve was not foreseen. Horticultural farms in the lake region have encroached on riparian ecosystems, leading to pollution and excessive withdrawals of water from Lake Naivasha. The lake continues to recede, with a concomitant loss of aquatic life, threatening the livelihoods of local fishers and the food supply. The challenge is to guarantee the necessary inputs into production on a sustained basis while limiting environmental externalities.

Lake Victoria fisheries (a common-pool resource challenge). A combination of poverty in the fishing com-

Sources: Bolo 2006; McCormick and Mitullah 2005.

munity, heightened competition, and an ineffective regulatory regime threatened to transform Lake Victoria into an open-access resource, with dire consequences for fishers' livelihoods, fish populations, and the quality and quantity of lake water. Through efforts by the government, international organizations, and civil society, all stakeholders have been involved in managing the fisheries resource. Fishers have been involved in planning and managing fisheries, which is expected to increase their access to Lake Victoria fisheries and help reconcile the potentially conflicting goals of sustainable fishery management and the livelihoods of communities that catch fish using improper gear and methods.

LESSONS LEARNED AND RECOMMENDATIONS FOR SUPPORTING CLUSTER DEVELOPMENT

In developing a cluster initiative and identifying supporting investments, practitioners need to know which emerging clusters have potential and which analytical tools they will need to develop a program or project. Successful clusters develop on the basis of specific combinations of capabilities, incentives, and opportunities. It is hard to predict which of the locations identified in the first phase of this process will become the dominant location in the final phase. Policy makers and development practitioners should promote clustering in sectors that already show comparative advantage (Rodriguez-Clare 2005) rather than distorting prices by promoting the development of sectors with high clustering potential. It is important to include several key clusters in the long list of candidates for inclusion in the initiative. This limits the danger of trying to create clusters where none exist (World Bank 2009).

Identifying emerging clusters with potential

Before selecting specific clusters for intervention, industry specialists should carry out *broad cluster mapping* at the national level. The regional economies in a country are specialized, with each region exhibiting competitiveness in a different mix of industry clusters. It is very important not to ignore interdependencies between regions and between clusters. Cluster mapping will help assemble a detailed picture of the location and performance of industries with a special focus on the dynamics, linkages, or externalities across industries that give rise to agroclusters.⁵

The analysis of emerging clusters begins by identifying either a driving, export-oriented industry or a fast-growing “emerging” industry. Export-oriented industries can be identified using the *Employment Concentration Factor*, an *Input-Output model*, *Cluster Dependency Factors*, *Specialization analysis*, and the *San Diego cluster analysis*.⁶ All are described in detail in SANDAG (2005) and Goetz et al. (2004).

Analytical tools for developing a cluster initiative and informing investments

Once potential clusters are selected for inclusion in an initiative, several analytical tools can guide cluster initiatives and investments. *Product and market segmentation* will identify the products and markets in which each cluster competes. These products and market segments can give direction to *Porter’s five-forces* and *competitiveness position*

analyses, which offer more rigorous approaches to the question of where to compete (for details on all of these tools, see World Bank 2009).

It often is vital to the success of a cluster for a donor program to help *assess the potential of target markets*, in particular those in developed countries. Focus first on existing export contacts and identify specific buyers. Include detailed monthly pricing information from United States and European markets to develop a strategy to enter market segments offering the greatest opportunities. Focus initially on customer demand and work back to what value chains and clusters produce and how they must change to meet customers’ needs. Agro-industries may have different market segments, with different demands and competitors; ensure that demand exists not only for the industry in general but also for the specific product and its value chain. Demanding markets can also be local markets, which can serve as an essential first step in the cluster’s development.⁷

Benchmarking of the sector is used to examine gaps between the performance standards of domestic firms and the standards required by multinationals, new markets, and new buyers. Cost benchmarking improves the awareness of internal costs and enables comparisons with competitors. It also helps in determining which niches may need less improvement than others and therefore inform product and market differentiation.⁸

Value chain analysis can contribute to strategic decisions about which products to target in cluster development. The analytical framework is based on three major functions in the value chain: source, make, and deliver. In addition, the chain’s performance is measured, benchmarks established, and performance gaps analyzed, taking into account government and market failures.⁹ Finally, *institutional mapping* can identify which public and private institutions exist in the cluster and determine which institutions may be reformed, abolished, or strengthened.¹⁰

An incremental approach to supporting and designing cluster development: some lessons

The *initial phase* of cluster development involves sowing the seeds of institutional reform, creating new forms of property rights, and setting out strategic programs. It also involves establishing trust among key stakeholders and convincing them to collaborate (which will also be a continuous activity). In *subsequent phases*, the focus shifts to providing incentives to assist startups, attracting entrepreneurs from the diaspora abroad back to the country, and developing

regional clusters, in some cases around special economic zones (Braunerhjelm and Feldman 2007; Zeng 2010). Many agricultural clusters might be remote from urban centers, and linking them to support structures such as banks or universities will be difficult.

Financing is another major issue in subsequent phases of cluster development, once startups and investors consider the basic framework conditions to be in place. As access to capital and finance increases for firms, they can increase their activity and productivity. Often, new investors such as venture capital firms cause new businesses to form, which in turn may alter the cluster.

A common learning trajectory among firms in developing countries starts off with process upgrading, followed by product upgrading. For this reason, an incremental approach to investments and programs seems promising. It may also be worth focusing first on local markets, if their potential is high enough, as a first step in upgrading. Early accomplishments are essential in fostering trust and need to be incorporated in early action plans. To create such trust, the project and the cluster should focus on a series of smaller value chain initiatives that create confidence in cluster activities while addressing constraints to innovation and competitiveness in various segments of the value chain. These initiatives may include technical assistance on low-cost production and postharvest handling, observation trips to see best practices in other countries, technical assistance for packaging, and trade missions to major international markets to meet potential clients.

SEQUENCING, PRIORITIZATION, AND THE INCLUSION OF LEAD FIRMS. Given limited resources and the ambition to achieve the biggest impact for the competitiveness of the agricultural cluster, the major and most urgent areas of public investment must be identified. The analytical information mentioned above should be combined with market trend and segmentation analysis to address major shortcomings in ways that support the strategic development of the cluster.

A parallel dialogue with major industry agents needs to be initiated, their feedback factored in, and a common vision built. The outcome should be an informed decision on where to invest and under what time frame, in line with the vision for the cluster. It is pivotal to identify stakeholder leaders when the project is being designed or first implemented and to identify lead firms and make them central in efforts to improve the value chain and develop the cluster. Lead firms in successful clusters often spearhead collaborative efforts, interact with government, and attract follower

firms. In projects where lead firms were missing, cluster development and value chain enhancement encountered serious obstacles.

In agriculture, most lead firms are major buyers with a stake in ensuring quality and price competitiveness and thus an important stake in the production process. Obtaining strong commitment from a lead firm is not always possible at the outset, and the implementation team will need to assess how much can be done to improve the value chain without cooperation from a lead firm. In successful cases that exhibited these characteristics, the cluster identified segments of the value chain where it could work without active participation from a lead firm, such as promoting micro or small and medium enterprises or dealing with environmental issues (USAID 2008). Ultimately, however, the support of lead firms is required for cluster promotion and value chain enhancement to be effective.

GUIDING PRINCIPLES ON TARGETED PUBLIC-PRIVATE PARTNERSHIPS. In agricultural innovation and clustering, PPPs (discussed in detail in TN 1 and in module 4, TN 2) can be seen as arrangements that assemble partners with different skills to generate, adapt, and/or diffuse innovation, build infrastructure, export and market products, and pool financial resources. Usually PPPs are formalized through contractual agreements specifying the partners' commitments and sharing of benefits. Potential partners include regional industry promotion agencies, research institutes, universities, extension agencies, market promotion agencies in the public sector, producer associations, and businesses and individual producers in the private sector. PPPs must satisfy the condition that overall benefits outweigh the overall costs. Without this synergy, there is no justification to partner.

Agents that promote PPPs, such as donor agencies, play a crucial role in motivating potential partners, building trust among partners, and providing credibility for PPPs in general (box 5.24). Matching grants are a successful mechanism for making these partnerships work, especially if the objective is to foster links between markets and the public sector (see TN 2, the discussion in the module overview, and World Bank 2010).

DIRECT AND INDIRECT WAYS OF FACILITATING AND INDUCING COOPERATION. When collaboration and joint action provide obvious benefits to all major stakeholders, as in the South African wine cluster, they may arise spontaneously. In most cases, cooperation among competing firms and producers does not occur naturally; it is likely to require deliberate and sustained action (Wood and Kaplan 2006).

Box 5.24 Public-Private Partnership Supports Cluster Development in Uganda's Fish-Processing Industry

After fish exports from Uganda were banned by the European Union owing to concerns about bacterial contamination, the government, donor agencies, fish-processor association, and private firms worked together closely and swiftly to help the industry improve its processing practices. Standard operating procedures were devised for inspectors, and a voluntary code of conduct on good manufacturing principles for fish-processing firms was established through the Uganda Integrated Program of the United Nations Industrial Development Organization (UIP-UNIDO) and the Uganda Fish Processors and Exporters Association. UIP

Source: Kiggundu 2005.

provided technical assistance to the government for timely and effective communication with the European Commission. It identified and paid private consulting firms (based in Europe) to strengthen the audit systems of the government's Department for Fisheries Resources and train fisheries inspectors as well as quality assurance managers across all firms that processed and exported fish. The Lake Victoria Environmental Management Program, supported by the World Bank, provided duty allowances, transportation, and other logistical support critical to implement the revitalized inspection and law enforcement system.

Both the provision of incentives and direct facilitation (often funded and implemented by the public sector) seem to be of value in cluster development.

Incentives for joint action can take the form of tax deductions for dues paid to business associations, access to infrastructure, or financial resources for firms agreeing to work together. In Cambodia, a PPP for food processing supported by GIZ enabled five companies producing mineral water, ice, and soy sauce to upgrade their manufacturing facilities, machinery, and technology. To receive financial and technical support, the companies agreed to invite interested SMEs to visit to exchange knowledge, skills, and experiences. As a result of this induced knowledge sharing, there was more demand than available spots to function as lead companies, and collaboration in the cluster and industry intensified.¹¹

Creating value along the supply chain and enhancing collective efficiency in the cluster requires trust among all stakeholders. *Direct facilitation* by the government and other organizations, including donors and NGOs, is often needed to stimulate and sustain joint action among key cluster agents (box 5.25). The "honest broker" role is essential, especially for uniting small producers and linking buyers and sellers. On the other hand, project staff must ensure that stakeholders eventually assume this role themselves in the interest of sustainability. Experience indicates that trust can be established more effectively by creating a flow of successful small activities (training, initial transactions between small and large producers, and so on) that lead to more significant transactions, such as joint exporting (USAID 2008).

DEVELOPING CAPACITY IN RELEVANT INSTITUTIONS THROUGH TECHNICAL ASSISTANCE. As the discussion has indicated, institutions, public and private, are crucial in agricultural clusters (figure 5.2). Through targeted programs, training (including study tours), and sharing international best practices, donors play a vital role in strengthening institutions and promoting cluster development. For example, donor support can improve the *capacity of state agencies in monitoring and enforcing quality standards*, as seen in the example from Uganda in box 5.24. Donors' involvement may be necessary to help incipient producers meet complex international standards. Buyers cannot play this role, because the standards embody specialized knowledge that most buyers do not possess (McCormick and Mittulah 2005). Adding capacity to an enforcing institution, and making sure the respective officers (and possibly some critical buyers) gain the necessary knowledge of sanitary and phytosanitary measures, appear to be vital components of cluster development and value chain enhancement in developing countries.

Donors can also strengthen the intermediary institutions (such as professional and business organizations) that act as important mechanisms for tapping into foreign knowledge, coordinating activities in a cluster, and lobbying government. Successful efforts to build capacity have focused on creating a service mentality, training staff, establishing proper financing schemes (such as a fee structure), and providing key business organizations with the necessary infrastructure (including a website). In extension systems, donors add capacity by training officers to use new

Box 5.25 A Joint Action Project in Paraguay Improves Competitiveness of a Sesame Value Chain through the Cluster Approach

Successful joint action for cluster development and alleviating rural poverty occurred under the United States Agency for International Development's (USAID's) Vende ("Sell!") project in Paraguay. In 2003, sesame processors in north-central Paraguay were receiving orders from Japan and Korea that they could not fill, because regional suppliers could not provide the right quantity and quality of raw, industrial-grade sesame. The processors required a type of sesame that could be harvested only by hand. Some processors considered moving their facilities to other countries. Although sesame farmers and processors distrusted one another and had never collaborated closely, Vende brought them

together. The project helped them to set clear expectations and develop a realistic understanding of the financial returns to cooperation. It educated participants about the value chain and players involved. Its emphasis on increasing sales constantly reminded people that they were working toward a mutually rewarding goal. After two years, sesame production had doubled in Paraguay. Exports for the four processors involved in the program rose by approximately US\$8 million. Thousands of farmers in Paraguay's impoverished north-central zone and elsewhere increased their incomes by growing a more viable cash crop. Vende technicians are building local capacity to ensure that these efforts are sustained.

Source: USAID 2008.

methods to explain and demonstrate appropriate technology for cluster firms. In credit institutions, donors can add capacity by improving credit checks; the financial capacity of firms will improve if they learn how to write business plans. Donors may also assist in developing innovative financial services and credit schemes for banks.

Technical assistance has strengthened institutions and promoted cluster development by establishing national standards based on international food standards such as GlobalGAP. A cluster's competitiveness and capacity to innovate particularly benefits from programs that link firms within value and supply chains in ways that benefit all actors involved, including small-scale, geographically scattered producers. Subcontracting schemes are a particularly successful way to link small-scale producers with processors and buyers. They ensure reliable, better-quality production for buyers and access to credit, training, and economies of scale for producers.

MONITORING AND EVALUATION. Cluster M&E begins by mapping three main areas that require monitoring: the *resources* of the cluster (natural resources, firm absorptive

capacity, linkages, and human capital, for example), the *activities* to support the cluster (these can be private or public initiatives or donor programs), and the *finance* and *funds* available. The evaluation should also be designed to capture *lessons on process*. Results of cluster initiatives may not mature for a long time. To deal with the inherent challenges, it could be useful to devise an M&E assessment similar to the *management effectiveness tracking tool* used by the Global Environment Facility.¹² The tool categorizes indicators by context, planning, inputs, processing, outputs, and outcomes, all of which are relevant to agricultural cluster projects. Instead of absolute values, a score is used, so results can be plotted to facilitate comparison (for example, across agricultural clusters). The tool can be applied as a self-monitoring and external monitoring tool, and it gives immediate feedback and suggestions for improvement.

Apart from tracking process and results through a sound M&E system, a *good governance framework* is needed to minimize the risks associated with government failure related to misinformation or capture by the industry/cluster.