Module 7: Investment in Agribusiness and Market Development

Well-functioning agricultural markets and a competitive and innovative private sector are critical to agricultural growth and structural change. Efficient agricultural markets provide the basis for capitalizing on market opportunities and benefiting from increased farm productivity. Private sector and market development require a suitable enabling environment, characterized by a stable macroeconomic climate with adequate commercial laws and financial services, a well-functioning legal system, and adequate infrastructure. Enhancing private sector and market development in a way that includes the poor presents a key challenge to development efforts.

Rationale for Investment

In addition to agricultural producers, the farm sector encompasses a diverse range of large and small enterprises, sometimes referred to as agribusinesses, which include farm input and service suppliers (seed, fertilizer, equipment), downstream processors, traders, and retailers. These enterprises are interlinked in networks that together constitute agricultural market systems, which match buyers and sellers, provide a venue for consolidating small lots and grading, facilitate physical exchange and price discovery, transmit information, and manage risk. Markets coordinate the activities of input providers, producers, and downstream agents. NGOs, such as industry associations and producer organizations, play supporting roles.

Although a well-functioning private agribusiness sector is a precondition for a productive farm sector, the environment for private sector operations frequently has serious limitations. Rural areas often lack infrastructure, effective local government, adequate commercial and social services, and information and communication systems. In addition, product and often factor markets do not function well, and considerable interregional market rigidities exist. These difficulties increase the risks associated with doing business and contribute to interregional disparities. When agroenterprises find it too costly or risky to rely on small-scale farmers for supplying raw materials, these farmers are excluded from market opportunities. For agricultural growth to be pro-poor, the rural poor must be integrated successfully into expanding markets.

The competitiveness of agricultural production and market efficiency are becoming more important with the commercialization of agriculture and the growing importance of global market access provided under the WTO. Increased competitiveness in national and international markets has become a core issue for national policy (box 7.1). Privatization and market liberalization reforms continue in many countries and, even where they are completed, must be accompanied by a thorough review and reform of public policy relating to private sector and market development.

Many requirements for effective market and private sector development have public good characteristics. Examples include contract law and other legal provisions, trade agreements, competition policy, food safety regulations, the establishment and

enforcement of grades and standards, infrastructure, training, market information services, and overall coordination of public and private sector activity. Some of these requirements can be met by the private sector, but they often require regulation and cofinancing or approval by the public sector. Public investment to improve the rural investment climate improves the competitiveness of agriculture and rural enterprises. Without the support of enabling institutions in the public sector, private agroenterprises and markets will remain inadequately developed and inequitable.

Box 7.1 Competitiveness and supply chains

Competitiveness is the ability of enterprises to earn a sufficient income for employed labor and capital. If a firm is competitive, it can invest to expand, innovate, and adjust to changes in markets. Competitiveness depends on the cost structure and on prices realized on sales, which are factors that depend on a firm's own performance, on public infrastructure and services, and on the performance of other institutions that provide a firm with inputs and services. Since firms that are linked to distant input or product markets often depend heavily on other firms and the public sector, competitiveness may need to be analyzed for clusters of enterprises with interrelated activities.

Competitiveness frequently depends on a chain of firms that together produce, collect, process, transport, and sell products. In agriculture, many firms and farms are strongly interdependent in such supply chains. For example, for fruit producers in Ghana to be competitive, they must be effectively linked with suppliers, technology providers, traders, processors, transporters, and retailers in the UK to earn sufficient income for their labor, land, and capital. Supply chains provide for market linkages that ensure the supply, quality, and safety of agricultural products. The chain's performance depends on the effectiveness of cooperation and coordination among all partners in the chain.

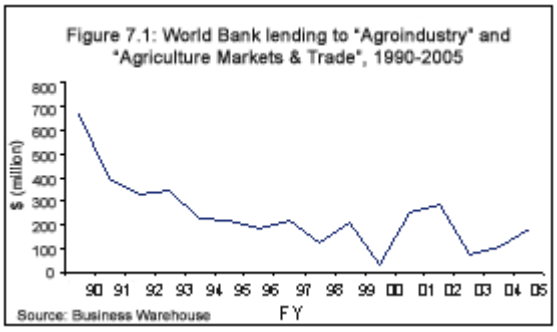
Source: Authors

Improved market efficiency and greater private sector activity are essential to aid the transition from subsistence farming to more commercialized agricultural systems. The latter produce and market food staple crops more efficiently, or they produce higher-value products (mainly livestock, aquaculture, and horticulture products) that require more inputs, processing, and handling. Market efficiency improves competitiveness in local and foreign markets and increases incomes to farmers, laborers, and small entrepreneurs involved in input supply and downstream processing and distribution. Private sector development typically generates employment opportunities distributed across a broad spectrum of the economy. Increased market efficiency can also improve living conditions for poor consumers by reducing food prices, improving food quality and variety, and increasing the accessibility of food and other consumer goods. As a result, real household income rises and nutritional status improves.

Past Investment Activity

In the 1960s and 1970s, governments in many countries played a direct role in input supply, production, trade, transport, and distribution, or at least they had a dominant role in the control or management of these markets. The World Bank and other donors provided significant direct investment in parastatals (state-owned companies), government-controlled cooperatives, and public marketing. When government-dominated

systems fell into disgrace in the 1980s and 1990s because of their poor performance, lending for these types of investments disappeared. Difficult, lengthy, and sometimes disruptive processes of privatization and market liberalization marked the ensuing transition from government-dominated systems to market-based systems. World Bank support focused mainly on lending for adjustment and reform. Direct investment was left to private investors, commercial banks, and, within the World Bank Group, to the International Finance Corporation (IFC).



Although privatization and liberalization were often necessary to stabilize economies and provide a basis for economic growth, in many cases these reforms did not result in a quick response from private investors. The long legacy of state-controlled and parastatal-managed markets in many countries left the institutional and policy frameworks for liberalized and private sector-led markets underdeveloped, and private sector capacities remained relatively limited. More recently attention has focused on strengthening a new architecture for agricultural market institutions and incentives, promoting private commercial activity, and reorienting state activity to the provision of enabling regulatory and physical infrastructure. As a result, Bank lending for agricultural markets and trade and agroindustry has begun to increase again.

Key Issues for Investment

The expanding role of the private sector is increasingly realized, as is acceptance that markets are the best vehicle for rural economic growth and for facilitating specialization and diversification. The increased focus on private enterprise and market development for poverty reduction emphasizes improvement of the enabling environment and an adjustment of priorities to facilitate market participation by the poor. Key issues in this regard include adapting to globalization pressures, defining public and private roles, communicating with the private sector, public-private cooperation, managing risk, improving market access, promoting competition, addressing food safety issues, and ensuring gender equity of growth.

Adapting to globalization and dynamic market change. Rapid changes in consumer demand, technologies, and organization of markets and supply chains present continuous challenges to producers. Competitive forces require producers to regularly adjust the technologies employed in production and marketing processes and to improve the efficiency of linkages within supply chains. Agribusinesses must have the flexibility to adapt as new technologies emerge, as new trade and market requirements are established, and as consumer demand evolves. Grades and product and process standards are taking on greater importance in light of consumer (and the retail gatekeeper) demands for quality, safety, authenticity, and sustainability of products. The need to meet these demands can represent a major challenge to market entry or continued market access. The government's role is to efficiently provide the public goods that enable private enterprises

to competitively produce for local and international markets, and to ensure that the benefits of these interventions do not bypass the poor but expand their production and income opportunities.

Defining public and private roles. One of the most difficult challenges for policy makers in a developing market economy is to find a good balance between public and private responsibilities. Although public goods are the responsibility of the public sector and private goods of the private sector, many goods and services, the so-called "impure public goods," have shades of public and private characteristics that may require joint public-private action. Markets function imperfectly because of externalities, economies of scale, asymmetric information, nonexcludability, and excessive contracting costs. These market imperfections often require public sector intervention. But the identification of market failures and the justification of public interventions are complex and require significant analytical capacity. To ensure that the costs of public intervention do not exceed the benefits, public sector involvement must be guided by high-quality analytical work with regard to markets and commodity chains. Important information needs, issues, and guidelines include:

- The public sector should not do what the private sector can do (for example, direct provision or distribution of agricultural inputs such as seed or fertilizer).
- Public interventions should be reserved for activities that have the highest potential net benefits (that is, where objective policy research and analysis indicate the greater economic and social returns—not where powerful political lobbyists prefer).
- Subsidies of variable inputs and credit are usually undesirable. Exit strategies for subsidization and border protection are needed where they exist, and some transition mechanisms (such as direct income support) may be appropriate.
- Public-private cofinancing of lumpy, one-time investments is often a preferable strategy (for example, for information systems or transport and storage infrastructure).

Communicating with the private sector. In developing countries with a legacy of state dominance of the economy, the voice of entrepreneurs is often weak. Communication between the government and the private sector is not well institutionalized and often limited to larger companies with greater political influence. Smaller enterprises, in rural areas in particular, have little access to systems for public policy dialogue and therefore limited ability to influence political outcomes. In such situations, government decision makers may overlook important information and private sector concerns when preparing and implementing policies.

Similarly, donors also have little experience in working with the private sector because they are often legally confined to dealing with governments. Major efforts are needed to establish good communication and cooperation between private entities and donor agencies, to develop better mutual understanding, and to overcome past mistrust and antagonisms.

Public-private cooperation. Development of market institutions and provision of supporting public good services remain areas in which synergies can be obtained through cooperation between the public and private sector. Public-private cooperation is especially important for:

- Developing and maintaining market infrastructure, which reduces the costs of exchanging physical products.
- Developing and maintaining information systems for data on supply and demand, trade, prices, and technology.
- Preparing and implementing new rules and regulations related to agricultural, trade, fiscal, and economic policies.
- Facilitating efficient marketing functions through standardized terms for the delivery of products, their conditioning (sorting, packaging, grading, and labeling), the mode of payment, arbitration of commercial disputes, and policing of markets.
- Monitoring the quality of products through technical standards and norms.
- Research and development and training to improve skills of technical staff.
- Generic promotion of agricultural and food products in foreign markets.

Reducing risks faced by private firms. As a result of market liberalization, price risk has been shifted from governments to producers and consumers. The risks associated with private sector investment are exacerbated by ineffective systems for enforcing property rights and rules for contracts and by distortionary trade policies. High rates of inflation and shortages of foreign exchange contribute to investment uncertainty and the inaccessibility of intermediate inputs. Farmers and firms have "traditional" means of managing their risks (that is, through savings, diversification, and selective market relationships), but these strategies may result in lower than optimal investment and missed opportunities. A high-risk environment encourages a short-term perspective—it constrains the transition away from subsistence farming toward commercial systems, and it acts as an overall disincentive to the integration of the poor into the economy.

Governments can reduce risk for private entrepreneurs through a stable policy climate and better information services, technologies, and infrastructure. A functioning or enabling legal and regulatory environment and contract dispute mechanisms (for example, arbitration in the absence of an effective judicial system) are also important. The public sector can facilitate the use of traditional commodity exchanges (for example, spot markets) as well as more complex markets for risk management (for example, futures, hedging, and insurance), and in certain cases it can promote the establishment of new commodity exchanges.[1] Safety nets will be needed in some instances to cushion some groups from adverse social and economic aspects.

Reducing barriers to market access and ensuring equitable outcomes. The impacts of market development are highly differentiated across rural enterprises, community groups, and individuals. Some stakeholders (the landless or women, for example) stand to lose

1 See the AINs in Module 11, "Commodity Price Risk Management" and "Agricultural Insurance."

from the development of more open and competitive markets, and these groups often require targeted efforts to mitigate potential negative impacts and promote equitable access to benefits. Small enterprises are more dependent on public services than larger enterprises, because they lack economies of scale for contracting their own technical and management services. They have less political influence, and public officials often have little knowledge of the needs of small enterprises and the obstacles they face. New technologies and new market requirements may also tend to exclude small producers. Market forces alone will not ensure their participation because of the potentially high transaction costs faced by upstream and downstream economic entities involved in transactions with small, dispersed groups. Public support initiatives, especially technology, information and advising services, and the strengthening of producer organizations (POs), are often required to provide a level playing field that enables small enterprises and small farms to participate in free markets.

Promoting competition. In government-dominated markets, competition was seldom encouraged, whereas in a market economy it is crucial. An important issue for government policy is to promote competition through free market entry, and to curb monopolistic and monopsonistic market power. Since globalization forces can concentrate enormous market power, government capacity to apply legal and regulatory checks and balances is essential to ensure a level playing field for local enterprise. Promotion of regional markets across national borders with harmonized regulations, grades and standards, research and information systems, and business certification, can all expand the scale of production and marketing. This will improve market efficiency and also reduce market entry costs and expand opportunities for local farmers.

Labor markets. Availability of skilled labor and flexibility of labor markets are important considerations in investment decisions for private sector enterprises. Labor market regulations can have major impacts on the cost of labor. For instance, if layoffs are very expensive as a result of employment contract regulations, employers may be discouraged from hiring new labor. An important trade-off in designing labor policy is to accommodate the needs of (and compliance costs for) local industry, while ensuring that the interests of the local workforce (the poor, women, and the underrepresented in particular) are fully addressed. Application of sound labor laws (following International Labour Organization standards) encourages pro-poor growth and increases the ability to access some international markets and meet the labor standards set by foreign buyers.

Food safety and standards. International public sanitary and phytosanitary standards pose important problems for exporters from developing countries with their limited institutional and financial resources. These standards involve protection of public health, prevention of the spread of harmful animal diseases and plant pests, and protection of ecosystems. Of increasing importance are requirements of private sector buyers in OECD countries, who often set product and process standards, involving environmental and social requirements that are well in excess of minimum legislated food safety standards. With the rapid increase in proportion of food products marketed through supermarkets (both in industrial and developing countries), it is critical that coordinated supply chains enable producers to meet the specific requirements of modern retailers. They should also

certify that the grades and standards they set (as well as government implemented safety standards) have been satisfied.

Gender. In many countries, the management of certain crops and particularly agricultural processing is traditionally viewed as "women's work." Increasing numbers of women are participating in the formal labor force (in field production, in pick-and-pack operations, in food processing plants, and in managerial and supervisory positions). It is important to ensure that women producers are not discriminated against in terms of opportunity to participate in national and international markets through producers associations and contract farming. Similarly, female workers should have acceptable employment conditions, and women entrepreneurs should have equal access to credit, training, and market contracts. Gender-related issues in market and agribusiness development must be fully explored through sound gender assessments, as a basis for planning any new public investments.

Future Directions for Lending

Public support for development of agricultural markets and private sector capacity can involve: improving the policy and regulatory framework; privatization; provision of public good infrastructure and services to enhance competitiveness; development of entrepreneurial capacity, industry and producer associations, and new market chains; and information and communication systems. The most crucial government responsibility is that of formulating economic policies, which requires continuous policy and market analysis. Most direct investments are the responsibility of the private sector, but large-scale public sector investment may be required for public infrastructure.

For donor agencies, priority investments should be directed at economic and sector work to support policy formulation and competitiveness planning. Lending for infrastructure can be significant, but most other investment needs (generally related to capacity building) are likely to be relatively small, even though they may be crucial to market and enterprise development and hence to rural growth and poverty reduction.

Improving policy and regulatory frameworks. Lending in support of policy formulation and regulatory frameworks will typically need to focus on policy analysis, restructuring of public services, and building public and private sector capacity. Although many countries have implemented major policy reforms, the business environment is often still far from conducive to private sector growth, especially in rural areas. Investment Climate Assessments (ICAs) have become a common tool to identify major obstacles for private sector development. While these assessments are being adapted to cover rural areas to provide input to policy dialogue, and the preparation of lending operations, it is important to consider the full range of analytical methods and frameworks, and to adopt innovative approaches where appropriate.

Effective legal and regulatory policies for efficient functioning of markets (for example, contract enforcement rules, labeling regulations) are critical to increasing investment. Many developing countries have complicated systems of business regulations that increase costs of private sector operation and open avenues for corruption. A sound legal

framework and effective mechanisms for efficient and fair adjudication of contract disputes is necessary in any country to enable efficient market transactions. Trade policy, including duties and quotas on imports and taxes and subsidies for exports, may distort relative prices and can have a major impact on investment. Monetary policy affects investment through direct effects on interest rates (the cost of capital). Property rights (intellectual, land) must be protected to encourage investment and innovation.

Privatization. Privatization continues to be an important area for reform, because many inefficient parastatal enterprises still exist. The complexity of privatization of agricultural industries is due to the interlinkages of input supply, financing, and commodity markets and the political sensitivity of food supply and prices. The transition from public to private ownership has major implications for financing production and processing systems, since implicit in the previous financing for such systems was the de jure or de facto exclusive commodity procurement and marketing rights of the state enterprise. Privatization therefore may require reengineering of the entire supply chain, from farm to factory to buyer. Particular attention should also be given to market-making (box 7.2).

Improvement of public goods and services. The ability of private enterprises to compete depends very much on the availability and quality of public goods (incentive structures, infrastructure, public services) and public "bads" (cost and disincentives of misguided interventions, poor governance). Investors will invest capital where infrastructure and services enable them to compete in the marketplace. Well-targeted public investments in roads, ports, telecommunications, marketplaces, and water supply have an important bearing on private investment and competitiveness. The same can apply to government support for, or direct provision of, agricultural, postharvest, and food technology research, training, and dissemination. If these basic needs are not met, there will be underinvestment in the local economy.

Box 7.2 Privatization and market-making

The "privatization as asset-transfer" approach has frequently given insufficient attention to the range of market-making functions and services (risk management, price discovery, quality control, market intelligence, production statistics, remote area collection services, farm extension) formerly undertaken by state enterprises. Key to fostering development of new institutions is the need to: promote government commitment to "sell" the reform to stakeholders and support the implementation process; develop a consultative process that sharpens understanding of key issues and provides a grounding and record for public debate; and plan for a two- to three-year transitional period that maintains the momentum of reform while avoiding the emergence of function/service gaps.

Source: World Bank 2001

Developing entrepreneurial capacity. Entrepreneurial and managerial skills—including market research, promotion, pricing strategies, marketing channel management, and other skills—necessary for effective private sector investment are not widely developed in many countries. This is due, in part, to the past dominance of processing/marketing activity by parastatal (and/or foreign) enterprises and the concentration of trade in unprocessed standard commodities. This limited skills base inhibits the ability of entrepreneurs to penetrate international markets for nontraditional products and to

compete with established companies in domestic and regional markets. Business development services (BDSs) that help firms improve quality and efficiency of processes, reduce costs, and expand operations are important to all firms, but are especially critical to small firms and new start-ups. Needs assessments indicate scope for programs of training, internships, and technical assistance to build skills in small business management, so that small firms and those in rural areas develop capacity to participate in markets. BDSs are best provided by financially autonomous entities, capable of securing much of their funding through the recovery of costs from users. Examples in agriculture are agribusiness development centers (ADCs), project development facilities, learning through exchange schemes, and nonprofit private sector institutes (box 7.3).

Business associations and empowerment. Business associations have valuable roles to play as vehicles for connecting producers and clients, crystallizing and expressing the viewpoints of affinity groups, taking collective action, networking among members, and providing economic services in training, information, facilitation, technology, and legal support. They include chambers of commerce, regional business councils, and business associations that include seed trade associations, fertilizer importers and dealers associations, fruit and vegetable exporters associations, rice millers associations, and others. These associations often represent influential private sector entrepreneurs—although not necessarily the poorest ones—who constitute a potential engine for growth, and could therefore contribute substantially to government policy and strategy formulation.

Box 7.3 Agribusiness development centers

Between 1993 and 2003, project-based agribusiness development centers (ADCs) have been established to provide advisory and analytical services to private sector agroenterprises in a number of countries. They have played a variety of catalytic and facilitation roles, although they generally focus on technical and market information. The experience of ADCs points to the importance of: clear definitions of objectives and clientele; credibility and competence of staff (dependent in part on the extent to which the ADC board is led by the private sector); a realistic strategy for financial services; and the separation of technical and financial services.

Source: World Bank 2001

Governments can facilitate association development but must be cautious in initiating activities, as this may be perceived as government control. It may also undermine the legitimacy and private sector members' ownership, making continued funding uncertain once public sector support is withdrawn. Any program providing financial, technical, and/or human resource support to associations should involve a commitment of the association itself. At the local level, building capacity of local private sector associations can facilitate dialogue with local government, and be an important element in empowering small businesses.

Cooperatives and producer association-owned enterprises. A special type of private collective enterprise is that of the producer group-owned enterprise, usually based on small-scale farmers associating in cooperatives, producer associations, or informal marketing groups. These group enterprises build economies of scale and improve small-scale farmers' marketing options, providing direct impact on the welfare and competitiveness of small producers, as well as being social safety nets (box 7.4). As

producers become more "market-savvy" their interest in such group enterprises is likely to increase, and enterprise development becomes more feasible and important.

A first requirement for public support for cooperatives and other enterprises owned by producer groups is the establishment of a facilitating legal, regulatory, and policy framework for such enterprises. Additional support is often warranted to help these groups become established and overcome their disadvantages of limited business management experience, education, and poverty. Similar to support to other private entrepreneurs, direct public subsidies must be approached with caution. There must be a clear justification for public support to overcome initial constraints and a defined exit strategy to avoid dependency and continuing subsidies.

Box 7.4 Guinea: Foutah Jalon (Guinea) potato growers successfully competing with European farmers

The Federation of Foutah Jalon Farmers has 13,500 members who produce approximately 4,000 tons of potatoes every year. The Federation markets an additional 3,000 tons of nonmember production each year. Besides support to marketing, the Federation provides members with technical advice and inputs (imported potato seeds and bags). Marketing of potatoes is managed by a group of women called "*Dioulamoussous*," who collect produce from 21 Federation warehouses and resell it in the capital city of Conakry. The farmers and the women traders agree upon the producer price as well as the women's margin.

After negotiation with the Federation, the government agreed to limit potato imports from Europe during the period when Fouta Jalon potatoes are marketed. This protection measure allowed Fouta Jalon farmers to develop their production through improvements in productivity, storage, and marketing. In four years, yields per hectare increased from 3 to 20 tons. Protection measures have now been lifted, and Foutah Jalon farmers are competitive with European farmers. This scheme has been so successful that in certain villages people speak of urban-rural migration: urban people are moving back to Foutah Jalon to grow potatoes.

Source: http://www.paysansdufouta.org/

Supply chains for market integration. Perishable, high-value products with stringent quality and safety requirements typically require complex contracting arrangements to control quality and coordinate specialized production, trading, and processing activities.[2] Effective supply chains transmit demand signals to suppliers who in turn can respond flexibly and efficiently to satisfy consumer demand. This allows private entities to share information and technology, pursue marketing strategies, reduce risks and transaction costs, and safeguard quality and safety. Public support, through independent intermediaries with adequate knowledge of tools and technologies, can play an important role in enhancing the emergence of effective supply chains.[3] This must be based on sound industry or chain analysis and must take into account the resource availability

2 See the AIN, "Horticultural Exports from Developing Countries."

3 See the AIN, "Supporting Market and Supply Chain Development."

constraints and implications for small-scale farmers. POs are important for linking small-scale farmers to market chains.

Information services. Information is crucial to efficient agricultural markets. The availability of accurate price and other market information helps to reduce risks and transaction costs and enables market participants to plan and coordinate more effectively their production and trading activities. Although market information has public good elements, most of the efforts to develop public sector market information systems have failed, as most systems have lacked commercial utility and have been unsustainable. Building sustainable market information systems will require: identifying mechanisms for private management; obtaining at least partial cost recovery; having a modest scope, covering only one or a few commercially important commodities; ensuring a participatory process, with users defining their needs; including some nonprice data (market closures, quality comments, food safety problems); and making cost-effective use of available information technologies to achieve timely and wide dissemination.

Scaling Up Investments

Prior to scaling up, public investments in agricultural private sector and market development need to be oriented toward, and critically evaluated against, the objectives of poverty reduction, efficiency, and sustainability. Key outcome criteria will relate to market efficiency, including reductions of subsidies and market distortions, increases in quality and value addition, enterprise profitability, and employment generation. Two key safeguard policies generally relevant to investments in agricultural private sector and market development must also be considered (box 7.5). Various operational policies and safeguards relating to subsidies and grants may also be relevant.

Box 7.5 Key safeguard policy issues for private sector and market development investments

- Environmental Assessment (Operational Policy [OP]/Bank Procedure [BP] 4.01)—an Environmental Assessment is required if private sector or market development activities may have potential adverse environmental risks or impacts.
- Pest Management (OP 4.09)—private sector and market development investments involving procurement and use of pesticides or that might expand use of pesticides and unsustainable pest management practices require an Environmental Assessment, a Pest Management Plan, and a list of pesticides authorized for procurement.

Source: World Bank Operational Manual

Although the following investment notes discuss important themes for practitioners involved in private sector and market development, they by no means reflect a comprehensive collection. Future editions of this Sourcebook will include notes on other best practices that are equally important as those in this edition. Such future work will include: Facilitating Food and Commodity Markets, Managing Standards and Grades, Producer Organizations, and Trade Associations.

Selected Readings

Asterisk (*) at the end of a reference indicates that it is available on the Web. See Appendix 1 for a full list of Websites.

Dolan, C. S., and K. Sorby. 2003. "Gender and Employment in High-Value Agriculture Industries." Agricultural and Rural Development Working Paper 7. World Bank, Washington, DC.*

Jaffee, S. 1992. *Exporting High-Value Food Commodities; Success Stories from Developing Countries*. With the assistance of P. Gordon. World Bank Discussion Paper 198. Washington, DC.: World Bank.*

van der Meer, K. 2003. "Public-Private Cooperation in Agricultural Research: Examples from the Netherlands." In D. Byerlee and R. G. Echeverria (eds.), *Agricultural Research Policy in an Era of Privatization*. Wallingford: CABI Publishing.

World Bank. 2001. "Promoting Agro-Enterprise and Agro-food Systems Development in Developing and Transition Countries: Towards an Operational Strategy for the World Bank Group." World Bank, Washington, DC.*

References Cited

Fédération des Paysans du Fouta Djallon. http://www.paysansdufouta.org/.

World Bank. 2001. "Promoting Agro-Enterprise and Agro-food Systems Development in Developing and Transition Countries: Towards an Operational Strategy for the World Bank Group." World Bank, Washington, DC.

World Bank. Operational Manual. http://wbln0018.worldbank.org/institutional/manuals/opmanual.nsf/.

This overview was prepared by Sam Kane, Kees van der Meer, Derek Byerlee, and Gary Alex. Peer review comments were provided by Steven Jaffee, Kathleen Cloud (University of Illinois), and Ousmane Badiane.

Supporting Market and Supply Chain Development

Trade liberalization, urbanization, concentration of retailers, and quality and safety requirements are leading to rapid changes in the organization of markets. Market-driven systems are replacing supply-driven and product-oriented systems. Closed and coordinated supply chains can bypass open wholesale and spot markets. Supply chain development enables integration of market functions and linkages between different participants in the system, and it allows for better coordination and planning. Supply chain competitiveness and access to supply chains have become major issues for growth and poverty reduction in agriculture. The analysis of supply chains is important in planning investments to enhance competitiveness and market participation by small-scale farmers.

Globalization, changing consumer demands, and new information and communication technologies are key driving forces in global agro-food industries. Consumers are demanding more information on the food safety, ecological, and social aspects of the products they buy. Rising per capita incomes, urbanization, the increasing numbers of women in the formal labor force, and market liberalization have spurred the rapid growth of modern retail chains. Large supermarket chains, sourcing food from global markets, increasingly act as gatekeepers for consumer markets. In developing countries, supermarkets are rapidly increasing their share in the food market.

Investment in Integrated Supply Chain Systems

Fully integrated and coordinated supply chains catering to modern retailers and food processors are rapidly replacing sourcing from open markets, especially for perishable food but increasingly for food staples as well. Coordinated supply chains are institutional arrangements that link producers, processors, traders, retailers, and consumers. They regulate the flow of products, payments and capital, technology, ownership rights, and information among these participants and exploit synergies for market expansion and cost reduction. Closed chains perform the same functions within one company that controls various stages in the product chain.

The development, organization, and management of supply chains is primarily a function of the private sector and requires private investment in inputs, equipment, market information, technology, and skills. The public sector's role is to create favorable conditions for supply chains to develop, for public-private cooperation to emerge, and for smallholders and small enterprises to be included in supply chains.

Supply-driven systems producing heterogeneous commodities in uncertain quantities and qualities, once typical of agriculture, are becoming obsolete. They are being replaced by demand-driven supply chains, requiring major changes in production, technology, and logistics. Coping with these challenges exceeds the capacity of most individual entities. Public investment associated with policy and regulatory reform, improved infrastructure services, demand-driven public research and development, training, and advisory services may be beneficial for boosting the competitiveness of supply chains.

Private entities have commercial interests in cooperating in coordinated supply chains to share information and technology, pursue common marketing strategies, reduce risks and transaction costs, and safeguard the quality and safety of products. Nevertheless, cooperative supply-chain strategies require high initial transaction costs and are not without risks of noncooperation (trust of partners). Public involvement may be appropriate to facilitate the transition from product-based, supply-driven marketing systems to demand-driven arrangements, especially if the involvement of smallholders can be maximized.

Benefits

Benefits of well-coordinated supply chains derive from stable markets that can result in greater profitability and employment. Supply chain coordination can:

- Provide access to new market outlets and thus increase producers' ability to match production and demand.
- Provide access for producers and small-scale enterprises to information on technology, financing, and market requirements for qualities and quantities.
- Better control product quality and safety through tracking, tracing, and certification.
- Share risks among chain partners, especially for large investments.
- Reduce lead-time and losses of perishable products through joint planning and coordination of supply.
- Provide a means to pool production and thus develop economies of scale.
- Increase employment from enhanced participation in value-adding activities.

Box 7.6 Contract farming

Contract farming is a forward agreement between farmers and processing and/or marketing firms for the supply of agricultural products, frequently at predetermined prices. It can provide the necessary backward and forward market linkages for profitable smallholder production. The approach is widely used for cash crops, fruits, vegetables, and dairy.

For farmers, contractual arrangements can provide access to production services, credit, and knowledge of new technology. Pricing arrangements can reduce risk and uncertainty and give farmers the opportunity to diversify into new crops. Contract farming may be more efficient than plantation production, and it is often more politically acceptable. It can give agribusinesses the opportunity to organize a reliable supply of products of the desired quality and provide access to land that would otherwise not be available.

Contract farming requires a long-term commitment from farmers and the agribusiness, with both recognizing that honoring contractual arrangements is to their long-term benefit. The public sector can facilitate contractual arrangements by promoting the development of producer organizations (POs), the establishment of appropriate contract law, the provision of required infrastructure, and the development of effective land administration systems.

Source: Eaton and Shepherd 2001

Policy and Implementation Issues

Policy and regulatory environment. Private sector investment requires a sound enabling environment for enforcing laws related to trade, labor, the environment, contracts, and intellectual property. This kind of environment is especially important for international trade, the participation of foreign partners, and public welfare measures.

Infrastructure limitations. Traditional market and infrastructure services (wholesale markets, transport and communication systems, inspections, storage facilities) are often not conducive to the development and functioning of supply chains. Supply chains for perishable products in particular need reliable cold storage facilities at every link of the chain. The public sector can address infrastructure constraints through cofinancing arrangements that promote private investment in infrastructure.

Smallholder inclusion. Small-scale producers, especially women, are often at a disadvantage in adjusting to new market conditions, because they lack technical and market knowledge and investment funds. The contribution of individual smallholders is often of low marginal benefit for chain partners, while the cost of uncooperative behavior by a smallholder (for example, moral hazard in the use of antibiotics and pesticides) may be high. Contract farming can be a suitable arrangement to link farmers to supply chains, but in many cases other arrangements may be preferable (box 7.6). Special assistance (training, capacity building of POs) to make smallholders attractive chain partners can also be justified for externality and equity reasons. The participation of large-scale farms in supply chains can have substantial poverty impacts, as they often generate considerable employment, demonstrate ways to diversify income and security risks, and establish new market outlets from which smaller-scale farmers may subsequently benefit.

Time to build trust and accumulate knowledge. Development of supply chain entities involves much trial-and-error organizational learning. Knowledge *about* chains is essential for developing a workable structure, and knowledge *within* chains (such as product design, packaging, and distribution, or market and customer preferences) is essential for ensuring the chain's sustainability and efficient functioning.

Lessons Learned

Capacity of government to assist. Supply chain competitiveness depends on good logistics and low transaction costs. The public sector can create conditions for efficient supply chains to develop in the private sector, but government capacity to support supply chain development and increase the involvement of smallholders is typically limited. Pilot programs for supply chain development, based on public-private cooperation, can be useful to build capacity within the private sector and government (box 7.7). Specialized intermediaries are useful in collecting and sharing

Box 7.7 Building private and public sector capacity through chain pilots

In pilot projects, partners collaborate to identify and resolve problems, "learning by doing" and "learning from best practices," as chain partners analyze operations and look for practical ways to reduce costs and improve quality. Collaboration allows the dissemination of information on new technologies and on ways of improving collaboration among chain partners. Pilot projects show partners how to improve quality, certification, logistics (reduction of lead-time and storage), information exchange, consumer responsiveness, and innovation. The pilot project approach should be bottom-up, with initiatives for vertical chain coordination coming from potential chain partners. A typical pilot project lasts one to three years and consists of a four-phase cycle of orientation/analysis, definition, implementation, and monitoring and evaluation.

Source: Van Roekel, Willems, and Boselie 2003

information on tools, approaches, and experiences in supply chain development (Agri Chain Competence Center).

Flexibility. Markets and the profitability of products change along with frequent changes in consumer preferences and new competition. Supply chain partners need to learn how to deal with changing market conditions through flexible organizational arrangements, production and market diversification, and new technologies.

Technological innovation. Private enterprises generally have access to state-of-the-art technologies, but adapting them to local conditions might require additional testing and research. Government research and extension systems are usually not well suited to providing the timely and specialized support needed by private sector supply chains. The public sector can support innovation by maintaining core scientific expertise (in laboratories and key technical areas such as entomology, soil science, pathology), and by providing matching grants on a competitive basis to the private sector for technology development.

Domestic markets. The emergence of modern retail systems in developing countries presents new challenges and opportunities for producers. The new retail systems have product requirements for quality, safety standards, and timely delivery that are higher than those in traditional markets but still lower than in export markets. These local markets provide an avenue for learning and for gradual improving supply chains (box 7.8).

Box 7.8 Thailand: a fresh food supply chain for the domestic market

In 1998, Royal Ahold and the Thai Central Retail Corporation began a supply chain project aimed at providing Thai consumers with high-quality fresh fruits and vegetables at affordable prices, reducing lead times and postharvest losses, and raising knowledge of supply chain functions and principles. The project built a fresh distribution center for quality control, sorting, washing, packaging, and processing. Standardized crates, pallets, and crate-washing facilities were introduced and widely accepted by the Thai retail industry.

A network of contract farmers sells through buyers who are preferred suppliers because they can exert backwards control on the supply chain. Informal farmer associations are also in direct long-term business relationships with retailers. The emphasis of the supply chain development strategy has changed from supply chain optimization activities, such as reducing postharvest losses, shrinkage, and handling costs, to integral chain care such as Hazard Analysis Critical Control Points (HACCP) good agricultural practices certification. Supply chain partners have established alliances with research institutes and the Ministry of Agriculture to improve food safety assurance and certification systems.

Source: van Roekel et al. 2002; http://www.haccpforexcellence.com/

Recommendations for Practitioners

Orienting production and marketing systems to customer demand must be the driving force behind the operation of agriculture supply chains. Investments should seek to:

- Develop trust, commitment, and transparency among partners in the chain to improve communication and information exchange. Awareness-raising activities that give chain partners opportunities to get acquainted and build up relationships will help chain partners jointly plan the flow of goods, information, technology, and capital.
- Rely on the initiative and leadership of a private company for sustainability of a chain project. Leadership and power should not be concentrated within one company, and different chain partners can provide leadership in different areas.
- Promote public-private partnerships with stakeholders that include representatives from business, universities, ministries, and public agencies. Limiting the number of chain participating partners helps to achieve a chain market orientation.
- Recognize that social and cultural differences can lead to misunderstandings and miscommunication between chain partners, especially when chains include foreign participants.
- Recognize that different chain partners are often responsible for supply chain strategies at the policy level and that strategies need to be translated into incentives at the operational level to avoid conflicts among chain partners.
- Provide incentives to discourage key individuals from leaving the chain, as collaboration is often based largely on the commitment and knowledge of one or a few persons (box 7.9).

Box 7.9 Potential investments

Boosting national capacities in supply chain development:

- Pilot projects for developing expertise of enterprises, producer groups, service providers, and public agencies (for example, research, inspection, certification bodies).
- Support to specialized independent service providers to develop and share expertise, promote public-private cooperation, organize training, and facilitate the development of supply chains.

Boosting capacities of individual supply chains:

- Review of policy and regulatory frameworks for supply chain development.
- Market and infrastructure services.
- Support for public-private cooperation in infrastructure services, research and extension, training, and other skills for supply chain management.
- Develop good agricultural practices/good manufacturing practices to meet buyer standards.
- Build capacity of producer organizations (POs) to participate in coordinated supply chains.

Source: Authors

Selected Readings

Asterisk (*) at the end of a reference indicates that it is available on the Web. See Appendix 1 for a full list of Websites.

van Roekel, J., R. Kopicki, C. J. E. Broekmans, and D. M. Boselie. 2002. “Building Agri Supply Chains: Issues and Guidelines.” World Bank, Washington, DC.*

van Roekel, J., S. Willems, and D. M. Boselie. 2002. “Agri-Supply-Chain Management: To Stimulate Cross-Border Trade in Developing Countries and Emerging Economies.” World Bank, Washington, DC.*

References Cited

Agri Chain Competence Center. http://www.kc-acc.org/.

Eaton, C., and A. W. Shepherd. 2001. "Contract Farming: Partnerships for Growth." FAO Agricultural Services Bulletin 145. Rome: Food and Agriculture Organization (FAO).

HACCP for Excellence. http://www.haccpforexcellence.com/.

van Roekel, J., S. Willems, and D. M. Boselie. 2002. "Agri-Supply-Chain Management: To Stimulate Cross-Border Trade in Developing Countries and Emerging Economies." World Bank, Washington, DC.

This investment note was prepared by Kees van der Meer, Sam Kane, and Gary Alex.

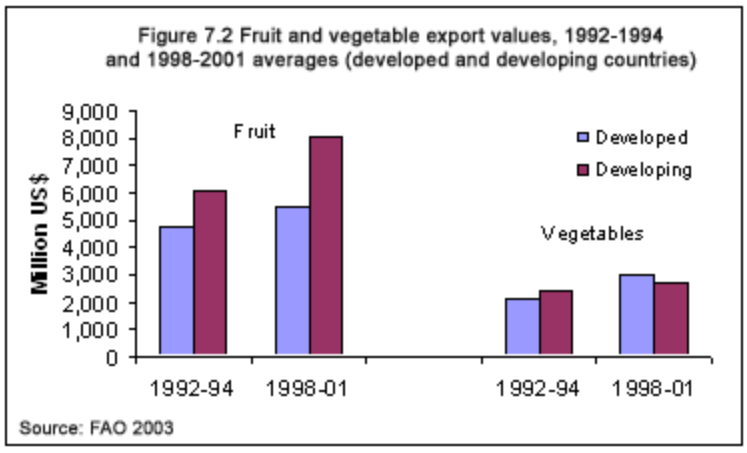
Horticultural Exports from Developing Countries

International demand for horticultural products with high unit value and income elasticity is growing rapidly. Growers in developing countries often have a comparative advantage arising from low labor costs, seasonality, and favorable natural resource endowments. Exploiting these opportunities may increase the income, skills, and employment of the rural poor. A highly integrated, demand-led supply system, cold chain infrastructure, and technical support are necessary to realize the potential benefits of horticultural production for export.

Low prices for cereals, coffee, tea, and cotton are forcing developing country producers to shift away from supply-led production and open market selling. The emergence of highly organized and integrated supply chains is opening new opportunities for these producers. The coordinated supply of perishable products to targeted, high-value consumer markets requires demand-oriented production and marketing systems.

Expanding Opportunities for Export Horticulture

Horticultural products include fresh, frozen, and processed fruits and vegetables, and products such as medicinal herbs, ornamental plants, and cut flowers. Key characteristics of horticultural production are high technological and managerial requirements, seasonality of production, perishable nature, and challenging requirements for export and marketing. Rising consumer income, urban lifestyles, demand for convenience food, ethnic niche markets, and trade liberalization have increased the volume and value of the international horticultural trade (figure 7.1). Growing demand for convenient consumer packages gives developing countries a chance to add value by grading and packaging prior to export.



North America, Western Europe, and Japan have been the main markets. Russia and Eastern Europe provide promising opportunities. The Middle East is important already for slightly lower grades. In local markets, demand is growing for produce that is not export quality, which allows growers and traders to generate revenue and experience that will help them to penetrate the high-value markets of industrialized countries.

Exports of fruits and vegetables from developing countries are likely to rise in the coming years. As competition is likely to intensify and erode profit margins for established fruit and vegetable exports, product differentiation will increasingly be necessary in order to

retain and capture new markets. Producers must adopt a strategy aimed at supplying changing products to changing markets to generate new value-adding activities. Inflexible suppliers that are unable to compete will be forced to exit the industry.

Benefits

Horticultural production for export benefits the poor in several ways (box 7.10). It creates employment in production, transport, input supply, processing, sorting, and grading. These activities offer job openings to the unskilled segment of the work force, many of whom are women. The poor benefit also from the increased employment on large farms and plantations, and from opportunities to produce for markets that these enterprises offer to small-scale farmers. The production of horticultural crops for export enables small-scale growers to acquire new knowledge and technology, which are valuable in producing and marketing other high-quality products.

Box 7.10 Egypt: the benefits of horticultural exports

In 1997, a donor implemented an export promotion project for horticulture to expand exports of grapes, strawberries, melons, mangos, green beans, and cut flowers to regional and EU markets. The agency provided assistance for:

- Managing production and marketing, including cold chain and logistics systems.
- Accessing cultivars that were disease resistant and better suited to market windows.
- Managing labor engaged in production and postharvest tasks.
- Accessing production technologies, including farm water management technologies.

By 2001, grape exports had tripled, strawberry and melon exports had doubled, and green bean exports had increased by 30 percent, compensating for declining mango exports. These increases generated 8,000 jobs in production and processing, 5,500 of which were taken by women. In addition, the project spawned 22,000 jobs in related activities. Quality assurance and compliance with market requirements improved while transport costs fell by US$1.7 million for grapes. Exposure to new production techniques for as many as 100,000 small- and medium-scale farmers led to significant adoption rates. The project trained female packinghouse workers to take on supervisory and management roles.

Source: Lambert 2002

Policy and Implementation Issues

Market orientation. Profitable horticultural export systems must satisfy consumer demand in end markets. Identifying demand and supplying markets is largely a private sector activity—government attempts to lead in this field have usually failed. Traditional open markets that facilitate price discovery and valuation based on product specification remain essential to match buyers and suppliers of traditional commodities. Highly integrated market structures are similarly vital for horticulture.[4]

4 See the IAP, "Bangladesh: Autonomous Organization for Facilitating Market-led Export."

Enabling investment climate. The absence of government interference in commercial activities was a key factor in past successes, but the public sector must make the environment conducive to private investment (box 7.11). It must often take action to overcome market failure, reduce unnecessarily high transaction costs, and in some cases provide support based on an "infant-industry" justification.

Box 7.11 An enabling environment

- *Macroeconomic and trade policy:* elimination of tariffs and other trade barriers, exchange rate policy, and nondistorting agricultural policies.
- *Legislation on plant variety rights (PVR):* drafting and enforcing PVR legislation that facilitates access to improved plant varieties ("imported technology").
- *Certification capacity:* compliance with market grades and standards has public good aspects that may complement national labor and environmental policies.

Source: Authors

Gender. Women often grow and market horticultural crops for the domestic market, but often they are not involved as contract growers in export supply chains. Instead, they become employed in the fields and in packing houses. In Guatemala, for example, women hold only three percent of snow pea production contracts, but they contribute more than one-third of total field labor and virtually all processing labor. Projects should promote women's access to contract farming and marketing in addition to encouraging fair employment practices.

Infrastructure. Information and communication systems, power and water supply, quality control, and testing and certification services are essential to access competitive markets (box 7.12). Cold storage must be operational at each distribution stage to avoid losses of quality and value.[5] Road, rail, port, and airport facilities are particularly important, as freight costs can amount to 30 or 40 percent of import prices. However, high costs, insufficient economies of scale, and an inability to make users pay for services from which providers cannot exclude them, often deter private investors. The public sector may need to finance or cofinance such investments, on the condition that exit strategies and private sector management and maintenance responsibilities are defined.

Box 7.12 Kenya: key findings in horticulture

Nontraditional horticultural crops are replacing coffee and tea, once among Kenya's major export crops, owing to declining coffee and tea prices on the world market and Kenya's comparative advantages in growing horticultural crops. A recent survey found that export horticulture initiatives led to poverty reduction. Other findings included:

- Access to irrigation is as critical as access to land.
- Young farmers are more willing than older ones to adopt new horticultural crops, especially when helped by family labor, older or experienced labor in particular.

5 See the IAP, "Mali: Building Mango Export Systems."

- Horticultural production requires considerable investments in postharvest and transport infrastructure, including air cargo.
- Managerial skills to link production with marketing and distribution are essential.
- Policy should aim to reduce barriers to the participation of the poor.
- Exporters should provide credit and extension services to smallholders.

Source: McCulloch and Ota 2002

Knowledge and technical support. Horticultural production systems are technologically and managerially intensive. They therefore require strong research and extension support. Current public research and extension systems are often geared to traditional food crops and offer little support to export horticultural crops. Much horticultural technology has to be imported to meet export market demands. To help farmers and traders make the most of these imported goods, domestic public research institutions must become more demand driven and responsive to markets, facilitate technology imports, and address second-generation problems such as outbreaks of new pests.

Grades and standards. Horticultural exports must satisfy stringent safety and quality standards (box 7.13). This requirement can put small-scale growers at a disadvantage, because they typically cannot produce large volumes of homogeneous, high-value produce, and there are risks associated with pooling production that must meet standards. Certification costs can also be a hurdle. Public investment may be needed to help farmers and other market chain participants meet standards. Outgrower schemes can help farmers meet the certification requirements required for some markets.

Box 7.13 European Union marketing standards: compliance with EC No. 1148/2001

EU Regulation EC No. 1148/2001, introduced on July 1, 2002, requires all fresh produce arriving in the EU to undergo an ISO 9000-style inspection to verify conformity with marketing standards. This inspection is carried out at the port or airport before produce is released into circulation. The only exceptions are for consignments with certificates of compliance from countries whose systems of export quality inspection have been approved by the EU. Such consignments, with both a phytosanitary and a quality conformity certificate, are released when customs procedures are complete. Exporters with approved certification systems obviously have a competitive edge. Some countries, such as Jordan, have established a pesticide residue testing laboratory and a heavy metals testing laboratory and issue conformity documents on consignments to the EU.

Source: Authors

Lessons Learned

Feasibility analysis and planning. Horticultural exports are potentially profitable but risky. They require matching consumer demand with production potential and capacity for risk management, and they take time to develop. Significant financial resources and a flexible, long-term perspective are essential for potential market entrants. Where farmers and entrepreneurs often lack the skills and resources to conduct market analyses, develop personal contacts, and run marketing trials, government support can be crucial. But as the

public sector is not good at "picking winners," it should limit its support to providing unbiased market analyses and technical assistance.

Risk. Horticultural products are perishable but must meet strict quality standards. Failure to deliver produce on time affects the exporters' credibility and reputation. Producers have two options to reduce their risks: they can offer a variety of products or exploit comparative advantage and specialize in producing one product. Specialization is often necessary and can be supported by innovations in irrigation, pest monitoring, crop rotations, and controlled atmosphere storage to maintain production levels and protect product quality.

Link between local and export production. Local markets provide growers and traders with experience with which to enter export markets and with outlets for surplus produce that does not meet export standards. The demand and standards in export markets often differ from those in the domestic market, and technologies and systems are needed to establish the competencies needed to supply the primary market.

Industry and trade associations. Most successful horticultural ventures are assisted by a trade association representing the interests of the sector. The association helps to organize production, negotiate contracts, develop analytical capacity, improve market information systems, promote products, coordinate research, enforce quality standards, and pool risks. The public sector can, with appropriate restraint, assist these associations through cofinancing schemes.

Finance. Growers' access to finance is often a problem. Domestic banking systems are typically not well developed, and commercial banks are reluctant to lend due to a poor knowledge of the sector, perceived high credit risks, and concerns over collateral. Contract production agreements involve agribusinesses and exporters supplying outgrowers with production inputs and committing to buy the produce, and they can provide one solution to the lack of credit for production.

Recommendations for Practitioners

Export horticulture is not new to the Bank portfolio but it is somewhat difficult to define what the Bank has financed and how it has affected the poor. This uncertainty is due partly to the complex nature of agricultural supply chains and to the need for multicomponent activities that, in appropriate sequence, meet the needs of multiple stakeholders and enterprises. Future investments must (box 7.14):

Box 7.14 Potential investments

- Technical assistance to build capacity to meet export standards and certify compliance.
- Development of horticultural, producer and trade associations and business development service providers.
- Public good infrastructure, such as transport and communication systems.
- Industry feasibility and planning studies.

Source: Authors

- Base analysis and planning on identified market demand and recognize the risk inherent in horticultural markets, along with the need to enter them with a long-term

perspective. Strategic planning must be flexible enough to adapt to changing competition and demand.

- Enable private investment and capacity to comply with standards and certification requirements for product quality and safety and with environmental and labor standards.
- Provide public goods that reduce supply chain transaction costs, such as information systems, research and extension, certification capacity, and risk management. Public involvement must not distort market mechanisms. It should foster participation. Grant schemes can be effective, but exit clauses are usually necessary.
- Build capacity in government agencies to certify product safety and standards and to expedite inbound products and outbound produce at national borders.
- Monitor impacts on the poor, on women, and on minority groups, recognizing that most poverty reduction impacts will be indirect.

Selected Readings

Asterisk (*) at the end of a reference indicates that it is available on the Web. See Appendix 1 for a full list of Websites.

Jaffee, S. 1992. *Exporting High-Value Food Commodities: Success Stories from Developing Countries*. With P. Gordon. Discussion Paper 198. Washington, DC: World Bank.*

Reardon, T., and J. Berdegué. 2002. "The Rapid Rise of Supermarkets in Latin America: Challenges and Opportunities for Development." *Development Policy Review* 20(4): 371-388.*

References Cited

FAO (Food and Agriculture Organization). 2003 "The Market for Non-Traditional Agricultural Exports (NTAEs)." Rome: FAO.

Lambert, A. M. 2002. "A Scoping Study for Detailed Case-Studies of Trade Facilitation/Export Promotion Projects for Non-Traditional Agricultural Products in Sub-Saharan Africa." World Bank, Washington, DC.

McCulloch, N., and M. Ota. 2002. *Export Horticulture and Poverty in Kenya.* IDS Working Paper 174. Brighton: Institute of Development Studies (IDS), University of Sussex.

This investment note was prepared by Sam Kane, Tijan Sallah, Gary Alex, and Kees van der Meer.

Private Seed Enterprise Development

Donor investment strategies should support the development of private seed enterprises to make quality seed available to small-scale farmers. Seed provision is at an important crossroads in many developing countries. Donor support to public seed enterprises has diminished because they have not been efficient. Strategies for supporting the private seed sector are still evolving. As a result, many farmers have little access to commercial seed, which has restricted their choice of crops and varieties. Since the benefits of modern plant breeding can reach farmers only through an efficient seed system, there is an urgent need to develop the private seed sector.

The development of private seed enterprises will require a long-term outlook, recognizing that the first steps will likely be taken with higher-value seed crops (such as hybrids). It will also require the strengthening of various elements of the seed system (these elements may be in the hands of various independent enterprises or combined in a single firm). Support must also enhance the development of competitive markets. Seed enterprise development includes attention to the policy environment, support to public sector plant breeding, seed regulatory reform, and strengthening input and output marketing capacities.

Developing Private Seed Enterprises

Public seed enterprises have introduced new crop varieties and have been important in development efforts, but it is increasingly difficult to defend their continued support, as seed production and marketing are inherently private sector activities. Public enterprises generally lack the incentives that a competitive private sector can offer to respond to changing demands or new markets or to increase industry efficiency.

An emerging private seed industry faces many obstacles, some relating to the general business climate and others specific to the seed industry. Public sector interventions should be market-based to the extent possible, using competitive grants, matching grants, and vouchers. Public-private cooperation can realize synergies in policy preparation and implementation, developing new varieties, and developing efficient and effective marketing outlets. Public investment can be justified because of the large spillover benefits to society. The seed sector comprises the following activities, which present varying opportunities for private and public investment.

- *Plant breeding.* Seed enterprises require access to new varieties. Although private plant breeding capacity is increasing, many crops will depend on public sector breeding programs for the foreseeable future. Public plant breeding organizations must have adequate links to private seed distribution mechanisms.
- *Source seed production.* Commercial seed production entails the multiplication of several generations of source seed (for example, breeder seed, foundation seed). Enterprises managing commercial seed multiplication may or may not have the capacity to produce and maintain source seed.

- *Seed multiplication.* Source seed is multiplied to produce commercial seed. In most cases, a seed enterprise supervises contract farmers to multiply seed.
- *Quality control.* The multiplication process must ensure both the genetic purity and physical quality of the seed. Quality control systems may range from managing a mandatory seed certification scheme to requiring only that seed be truthfully labeled. Responsibility for quality control is now shifting to seed enterprises.
- *Seed conditioning.* Seed must be cleaned, dried, treated, and stored before sale. This process requires specialized equipment and (for certain crops) considerable storage capacity.
- *Seed marketing.* Seed is sold through input dealers, requiring distribution capacity through a competent, independent network of wholesalers and retailers.

These components of seed provision may all be managed by a single firm or by various linked enterprises (box 7.15). Any investment in seed enterprise development must examine the options of supporting smaller, specialized operations versus larger, integrated firms, with the choice depending in large part on the resources and capacities available and the stage of evolution of the seed industry.

Box 7.15 India: the private provision of public rice varieties

Private companies produce almost one-half of the rice seed sold in Andhra Pradesh State, even though all varieties are publicly developed. The state agricultural university system's transparent procedure for selling breeder seed to private companies has facilitated private seed enterprise development. Andhra Pradesh has become a leader in the development of the private hybrid seed industry for millet and sorghum, and this experience is now being used in the less profitable (but high-volume) rice seed industry.

A range of capacities and "clustering" of facilities in the state allows dozens of enterprises to contribute to rice seed provision in Andhra Pradesh. Some enterprises specialize only in certain aspects of seed provision. For example, they supervise seed multiplication by farmers, contracting their services to seed companies that do not have a presence in the area. Other enterprises own seed cleaning and storage facilities, which they contract out. Such specialized services allow medium-scale enterprises to fill gaps in their capacity. At the other end of the spectrum, the larger seed companies have integrated operations and take responsibility for foundation seed production, supervision of growers, processing, and marketing.

Source: Tripp and Pal 2001

Benefits

The potential benefits of investing in seed enterprise development will depend on whether investment is for varieties or for seed. Investing in varieties represents the genetic gains derived from access to the new products of plant breeding, whereas investing in seed represents gains from the good physical quality of commercial seed. The two kinds of benefits are different, and commonly used phrases such as "improved seed" tend to confuse the issue.

Estimating the gains from access to new varieties may be relatively straightforward, if data are available on the yield (or other) advantages of new varieties over those currently in farmers' fields. Investments in developing new varieties have no payoff unless the new varieties reach farmers and, in many cases, the absence of a commercial seed system means that new varieties are not used. Farmer-to-farmer seed diffusion helps spread varieties but is rarely sufficient. Once new varieties are in their hands, farmers can often maintain new varieties by saving their own seed, in some cases maintaining varieties for many years with little loss in purity or performance. In other cases (especially for crops subject to significant cross-pollination), farmers need more frequent access to new seed supplies, and in the case of hybrids, they should purchase fresh seed each year.

Policy and Implementation Issues

Developing new varieties. Although private plant breeding for certain crops is increasing, public research systems will continue to play an important role, requiring support to strengthen scientific capacities and define respective responsibilities between the public and private sectors. In most cases, the public sector will need to maintain breeder seed of its varieties, establish an efficient system to give commercial enterprises access to this seed, and enforce a system of plant variety protection (ensuring access to royalties).

National seed regulatory frameworks. Systems for variety release and registration must be equally accessible for private and public plant breeders, and they must allow for rapid assessment and release. Harmonization of national release procedures across a region allows access to new varieties across a number of countries and avoids delays arising from individual and idiosyncratic country reviews. Seed certification and quality control procedures are generally managed by a public certifying agency. Consideration should be given to shifting these functions by licensing private seed companies to do their own certification and testing and by enforcing truthful labeling laws.

Neglected areas/crops. Given that farmers save seed from one season to the next, one major challenge for seed enterprises is to ensure repeat sales. The emergence of a private seed industry is almost always based on hybrid seed (which must be replaced each year to maintain its yield advantage), or on seed that farmers find difficult to save (such as vegetable seed). Seed of many crops, particularly those grown by isolated and/or less commercially oriented farmers, is less likely to be included in a nascent private seed sector. This lapse does not argue for continued public seed production, however, because public seed enterprises have also failed to reach this market. Instead, appropriate incentives for seed production—often local, informal, and small scale—can encourage enterprises to serve these markets before they are gradually included in a growing conventional private seed industry (box 7.16).

Gender. Because women have responsibility for seed selection and preservation in many traditional farming systems, commercial seed production presents good opportunities for including women as contract farmers and marketers as well as employees.

Box 7.16 Nepal: small-scale vegetable seed production

The Seed Sector Support Project, funded by the UK Department for International Development

(DFID), helped organize and train Nepalese farmers in vegetable seed production and arranged annual "workshops" in which seed dealers and producers met to establish contracts for the coming season. The project initially acquired source seed for the seed producers, but it has evolved to the point where the Seed Entrepreneurs Association of Nepal facilitates meetings with producers and helps members to organize source seed production.

Such efforts have expanded the amount of vegetable seed for sale in Nepal and in certain cases (such as radish) established Nepal as a seed exporter to neighboring countries. However, the model so far has had little success in establishing commercially viable small-scale seed production for crops such as rice, wheat, or maize.

Source Authors

Lessons Learned

Start-up crops/varieties. Commercial seed production must begin with products that have a high probability of repeat sales: hybrid seed, seed that is difficult to manage on-farm, or seed of crops that have a market premium for quality. Although commercial seed production has limited economies of scale, it does offer economies of scope: once a production and marketing system is in place for more profitable seed crops, other types of seed can be added.

Mini-pack distribution. The production and sale of small packs ("mini-packs") of seed of new varieties can provide additional business to emerging seed enterprises, help to develop a market for a wider range of seed types, and support the diffusion of new crop varieties. Such schemes often attract outside support from donors interested in promoting the use of new seed or responding to emergency situations characterized by loss of seed stocks (for example, droughts or conflicts). There have been a number of successes with contracting seed enterprises to package seed in small quantities that are attractive and affordable. Distributing these through rural input suppliers helps develop markets for quality seed. Where there are noncommercial elements in such mini-pack schemes, quality control and strategies for phasing out subsidies are particularly important.

Seed entrepreneurs. Seed provision entails a range of skills (plant breeding, seed production, marketing) that no one person is likely to possess. Seed businesses tend to be initiated by people who already have some experience: plant breeders (establishing their own seed businesses, "privatizing" their plant breeding skills, and developing marketing expertise); contract growers for seed companies with knowledge of seed multiplication; seed company production agronomists; and the commercial sector, either people involved in the grain trade or input marketing (box 7.17).

Box 7.17 Small African seed enterprises

The recent emergence of small seed enterprises in Africa illustrates possible sources of skills and resources to support seed enterprise development.

Uganda: Harvest Farm Seeds. A grain trading company in Kampala became involved in procuring grain suitable to be used as seed for relief operations in neighboring countries. With this experience, it established Harvest Farm Seeds to produce and sell commercial seed of public

varieties. It is planning to establish its own plant breeding capacity. Much of its stock is still sold to relief organizations, but the company is strengthening its marketing network in Uganda.

Ghana: seed producers. The collapse of the parastatal Ghana Seed Company left producers without a formal source of maize and cowpea seed. A project funded by Sasakawa-Global 2000 approached former contract growers about establishing their own enterprises. The project supervised their seed production, facilitated contacts with local input dealers to purchase and market the seed, coordinated access to public seed processing facilities, and provided seed certification services.

Source: Authors

Community seed production. Many development projects have used community-level seed production as the starting point for commercial seed development. Results have been disappointing, as most projects have demonstrated little commercial sustainability. Reasons for the lack of success are twofold: inattention to transaction costs (for making contracts for source seed, ensuring quality control, and obtaining information) and a lack of experience and resources for marketing. Community-level seed projects need more appropriate goals to be successful, such as testing and disseminating new varieties, developing farmers' experimentation capacities, and forming better links between farmers and researchers.

Emergency seed programs. Donors and governments often have been involved in the free distribution of seed, in the context of emergencies related to drought or civil unrest. Even in these cases, externally provided seed is not always a priority, but many of these programs still acquire a semipermanent status based on ideas of support to agriculture or introduction of new technology. Such interventions are difficult to stop, but they must be designed to do as little damage as possible to the prospects for seed enterprise development. This usually means using local seed enterprises, paying attention to farmers' feedback and demand for varieties, and distributing the seed through retail outlets (using vouchers). If these steps are not taken, it is very difficult for the commercial seed sector to develop, and farmers acquire the idea that seed is an input (often of low quality) that is given away.

Recommendations for Practitioners

Key public sector investments include sector analysis, the development of sector strategies, policy reform, establishing the regulatory framework, and capacity building (box 7.18). Donor support for seed enterprise development requires careful assessment of options. Often the most useful assistance comes not from large projects but from well-targeted support to specific policy initiatives or to lowering transaction costs for commercial development. This kind of assistance requires donors to have the capacity for sustained monitoring of institutional development. Other investment considerations include:

- Investments in building capacity of private enterprises and associations—often through matching grants—to develop new varieties and retail systems.

- Attention to the advantages of industrial "clusters" and to promoting the sharing of knowledge, facilities, and personnel.
- Emerging seed enterprises that can profit from technical and organizational support and links with enterprises in other countries.
- Support to regulatory harmonization across a region, which allows resources to be used more effectively and have a broader regional impact.
- Efforts by public agricultural research institutes to become more supportive of private seed sector development.
- Support for the development of rural input retailing and produce marketing, which are essential for promoting private seed sector development.

Box 7.18 Potential investments

- Needs assessment, training, study tours, and matching grants to support a national seed industry, including support to establish a seed trade association.
- Support for transparent, well-managed systems for breeder seed and foundation seed production and sale.
- Financial services support to seed enterprises.
- Competitive grants for applied research in breeding and variety improvement.
- Seed regulatory reform and regional harmonization of seed laws.
- Training and support for seed retailers, preferably through grants and voucher schemes.

Source: Authors

Selected Readings

Asterisk (*) at the end of a reference indicates that it is available on the Web. See Appendix 1 for a full list of Websites.

Almekinders, C., and N. P. Louwaars. 1999. *Farmers' Seed Production: New Approaches and Practices*. London: Intermediate Technology Publications.

Louwaars, N. P., ed. 2002. *Seed Policy, Legislation, and Law: Narrowing a Wider Focus*. Binghamton: Food Products Press.

Tripp, R. 2000. "Strategies for Seed System Development in Sub-Saharan Africa: A Study of Kenya, Malawi, Zambia, and Zimbabwe." ICRISAT Working Paper Series 2. International Center for Research in the Semi-Arid Tropica (ICRISAT), Bulawayo.

Tripp, R. 2001. *Seed Provision and Agricultural Development: The Institutions of Rural Development*. Oxford: James Currey.

Tripp, R., and D. Byerlee. 2000. "Public Plant Breeding in an Era of Privatisation." *Natural Resource Perspectives* 57. London: Overseas Development Institute (ODI).*

References Cited

Tripp, R., and S. Pal. 2001. "The Private Delivery of Public Crop Varieties: Rice in Andhra Pradesh." *World Development* 29(1):103-117.

This investment note was prepared by Robert Tripp (ODI), with input from Kees van der Meer, Gary Alex, and Sam Kane.

Promoting Private Sector Fertilizer Distribution Systems

Competitive markets for agricultural inputs are critical to agricultural development. Farmers need access to a wide range of fertilizers if they are to manage soil nutrients more sustainably, improve productivity, and diversify into new production enterprises. The development of fertilizer markets depends largely on reforming policies and regulations relating to imports and exports, to subsidies and protection of inefficient production and marketing entities, to market entry, and to truth-in-labeling requirements. The emergence of a competitive private sector fertilizer distribution network will also benefit from investment to address training needs, reduce transportation costs, and facilitate development of fertilizer sector trade associations.

Throughout the developing world, governments are disbanding and divesting parastatal fertilizer marketing organizations that have proven inefficient, costly, and unsustainable. Governments now see their role as that of establishing an enabling environment for a private fertilizer market to develop, yet fertilizer distribution systems have been slow to emerge in many countries that lack a tradition of private enterprise. Additional public support may be necessary to catalyze the development of efficient fertilizer distribution systems.

Fertilizer Market Development

Efficient fertilizer systems are needed to provide producers with competitively priced fertilizer products that meet the needs of local farming systems. Demand for fertilizer at the farm level must be induced ultimately by profitable production technologies and attractive farm-gate prices for agricultural products. Government policy, laws, regulations, and services should reflect a commitment to an expanded role for the private sector. Experience has shown that government subsidies can distort demand and hinder the development of a sustainable fertilizer marketing system.

The market development process typically includes an agribusiness development project, public policy reform, extensive training in business development and fertilizer technology, and formation of a trade association for fertilizer distributors. Activities focus on business development, private extension services, market information systems, private sector advocacy, and media information campaigns.

Public sector interventions to promote fertilizer markets must have the clear objective of producing independent, sustainable, and financially viable business entities. Donors can provide resources, methods, and tools for effective delivery of business development assistance to client firms. Assistance should enable farmers and fertilizer suppliers to make informed market choices and operate in open and competitive markets. The capacity of local intermediaries that provide services to agribusiness should be expanded, and in many instances, support for market and enterprise development (rather than direct producer assistance) will be the most appropriate mechanism to reduce poverty, albeit a relatively indirect route.

Benefits

Farmers, taxpayers, and consumers benefit from public investment that enables private sector fertilizer markets to emerge (box 7.19). Specific benefits include:

- Private fertilizer distribution replaces inefficient parastatals and subsidies, which are often a substantial burden on public expenditures.
- Private fertilizer distribution results in lower prices to farmers, more timely supply, greater variety in fertilizer formulations to meet local requirements, and production diversification (box 7.20).
- Improved availability of fertilizer and other inputs contributes to supply chain integration and increased agricultural productivity.

Box 7.19 Bangladesh: withdrawal of subsidies

During 1988–94, the Government of Bangladesh saved about US$119 million by withdrawing fertilizer subsidies. The 800-member Bangladesh Fertilizer Association was created, and the fertilizer retail network employed 170,000 people. Fertilizer sales increased at an annual rate of 8 percent, and government fertilizer imports declined from 100 percent to nil. The government instituted monthly fertilizer market monitoring to improve the industry information base.

Source: IFDC 1994

Box 7.20 Malawi: fertilizer for diversification

Malawi's heavy dependence on tobacco for export earnings has been a cause for concern. To make other export crops and food crops more profitable, the government is promoting increased fertilizer use. This strategy relies on applications of diammonium phosphate and urea topdressing for the maize crop, which is followed by groundnuts or pulses, both of which have good export potential. The use of residual phosphate and atmospheric nitrogen fixation by the groundnut or pulse crops reduces the cost of providing crop nutrients. Training for fertilizer dealers and fertilizer demonstrations for farmers have been key to the program's success.

Source: Bumb 2002

Policy and Implementation Issues

Parastatal competition. Public sector enterprises and subsidized fertilizer distribution discourage the development of competitive private agribusiness. Protection of inefficient domestic producers and traders typically reduces the range of products available and increases fertilizer prices. An enabling environment for agribusiness development is critical. Structured dissolution of state enterprises—with incentives for the private sector to fill the void—is essential to market development (box 7.21).

Box 7.21 Free distribution of fertilizer

Government or donor distribution of free fertilizer, as in some "starter pack" programs, can harm the development of a local fertilizer market. Free distribution of samples for trials can be an effective marketing tool in demonstrating the value of fertilizer, and in some circumstances (for example, following natural disasters or civil unrest), government assistance is appropriate to help farmers get land back into production. When free fertilizer distribution continues over time, however, there is danger of driving local retail distributors out of business. Voucher systems or mechanisms by which fertilizers are supplied through local retailers can avoid this risk while helping to build sustainable distribution networks.

Source: IFDC internal documents

Winners and losers. Although the privatization of parastatals and abolition of subsidies generally have many benefits, there are typically also some losers: users may face higher prices, producers in isolated areas may lose access to fertilizer, and employees in parastatals may lose jobs. Some phasing in of reforms and some compensation through safety nets or public investment, such as access roads, may be needed.

Distribution network coverage and cost. Private firms will target agricultural areas where they can make the most profit. This preference generally means that the more productive and accessible areas develop a dense distributor network first. Remote or sparsely populated areas are left unserved, or they are required to pay higher prices. Public sector interventions may be necessary to overcome logistical constraints, reduce transaction costs, and improve poorer farmers' access to competitively priced fertilizer products in remote areas.

Trade credit. Trade credit may be important for distributors to import adequate quantities of fertilizer, but experience has shown that direct public involvement in credit provision must be approached with care. Trade credit will generally be accessible to firms with good credit records, sound cash and profit projections, and good relations with suppliers. Long-term relationships lead to greater confidence in repayment and thus improved access to credit.

Partnerships. Fertilizer supply chains are often fragmented and uncoordinated. Strategic alliances among manufacturers, traders and importers, distributors and retailers, regulatory authorities, and farmers can enhance the flow of information (especially information on farm-level demand) and products throughout the supply chain. Such alliances are invaluable for identifying problems and opportunities for practical field initiatives.

Producer organizations. POs can be an important link in input marketing systems, usually in retail distribution or group purchasing from private retail distributors. In some cases, large formal POs may become fertilizer importers or wholesalers.

Lessons Learned

Improving the regulatory framework. The primary role of government is to provide a transparent and predictable policy environment, especially on trade and regulatory issues,

so that economic forces can guide fertilizer production and use decisions. Government must also ensure fertilizer product quality and integrity through truth-in-labeling laws, so that farmers actually get the quality and quantity of fertilizer they purchase. An appropriate government agency should collect and test samples based on complaints as well as spot inspections, particularly at the retail level. Safe, maximum limits are needed to regulate the content of heavy metals and other impurities in fertilizer and prevent damage to public health, crop production, or the environment. The enforcement of regulations is often more effective at the local than at the national level, though a national fertilizer information system facilitates effective dialogue between farmers and the fertilizer industry.

Trade association development. Trade associations can be important to fertilizer market development. Benefits of a fertilizer trade association include: improved access to trade and investment credit and business services; development of a market information system; better coordination of supply chain activities; identification of new products and markets; and development of trade relationships. Governance and election of association officials should be democratic, open, and transparent. Revenue can be generated through membership dues, fees for services, and other means to enable the association to become financially independent and sustainable (box 7.22).

Box 7.22 Kosovo: establishment of input supplier networks

In Kosovo between 2000 and 2002, the International Fertilizer Development Center helped establish five agricultural input trade associations, which obtained credit independently and imported fertilizer. As a result:

- Fertilizer use increased from 40,000 to 71,000 tons, commercial seed from 16,000 to 43,900 tons, and crop protection products from 25 to 80 tons.
- Sales of agricultural inputs increased by 64 percent to US$18 million, with US$9 million in fertilizer sales.
- Modern fertilizer use technologies contributed significantly to yield increases for wheat and maize of 69 and 150 percent, respectively, and increases in net added income of US$200 per hectare and US$726 per hectare.
- Trade associations established under the project lobbied successfully to eliminate tariffs on imported fertilizer.
- The European Agency for Reconstruction financed and supplied 35,000 tons of fertilizer, which was auctioned for distribution by the private sector.

Source: IFDC 2003

Fertilizer imports at optimal economies of scale. The competitive supply of fertilizer on local markets usually requires importers and distributors to operate on a relatively large scale. Because efficient minimum orders are large and there is a lag between product ordering and arrival, traders must anticipate demand accurately. Regional harmonization of market regulations can facilitate trade, eliminating the need for repackaging or relabeling, preshipment inspections, border taxes, and unnecessary testing. Groups of importers can pool imports to facilitate operations at an optimal scale. Forward selling contracts by importers to distributors and retailers shorten cash cycles.

Training in business management. Training in fertilizer business management involves financial and business planning, strategic management**,** competitive analysis, and procurement and marketing planning. The public sector must not assume a direct role in

these areas, but it can promote the development of managerial skills by cofinancing BDS providers or subsidizing initial use of these services.

Agricultural extension services. Extension services are often best provided by the dealers themselves, as extension can be viewed as a marketing activity to cultivate customer loyalty and as a cost of doing business (box 7.23). Public support can assist fertilizer dealers to provide extension services that involve advice, field monitoring, soil testing, export opportunities, input demonstrations, and field days.

Box 7.23 Ethiopia: extension services for fertilizer sector development

A recent World Bank project sought to increase agricultural productivity by developing an enabling environment for a competitive fertilizer sector, promoting increased and environmentally safe fertilizer use, and addressing supply-side constraints. Extension agents were trained in the technical aspects of fertilizer use and soil fertility maintenance, with the intention that they would provide advisory services to farmers on improved fertilizer use practices. While the extension service was not meant to get involved in fertilizer distribution, extension agents began to spend 50 to 70 percent of their time on fertilizer distribution and credit administration, leaving little time to focus on advisory services. Occasional adversarial encounters relating to loan recovery negatively affected the relationship between agents and farmers.

Source: World Bank internal documents

Recommendations for Practitioners

Once organized, the private sector can become a key partner in lobbying for the removal of constraints to private fertilizer market development. In the meantime, development of competitive private sector fertilizer distribution and marketing systems may rely on investments to:

- Privatize parastatals and avoid free or subsidized fertilizer distribution.
- Promote regulatory liberalization and ensure that business registration is not a barrier to new entrants.
- Establish the capacity for the government to monitor and enforce regulations on fertilizer sales, with particular regard to truth-in-labeling.
- Encourage development of fertilizer industry

Box 7.24 Potential investments

- Agricultural sector analyses to identify constraints to market development.
- Policy and regulatory reform in the fertilizer sector.
- Establishment of government regulatory capacity.
- Systems to monitor and enforce truth-in-labeling, including analytical laboratories.
- Training in the public and private sectors to improve analytical and managerial capacities.
- Facilitation of regional regulatory harmonization and procurement to achieve economies of scale.
- Port, rail, and road transportation and information infrastructure.

Source: Authors

trade associations.

- Encourage economies of scale in operations through sound import and export regulations, regional harmonization, efficient logistical systems, and collective procurement.
- Encourage private fertilizer distributors to provide extension services as a necessary business promotion service, and focus public extension services on addressing issues such as nutrient management and negative environmental externalities.
- Use study tours to market economies for government officials and fertilizer sector policy makers to promote greater understanding of the advantages of markets and the liberalization of regulations (box 7.24).

Selected Readings

Asterisk (*) at the end of a reference indicates that it is available on the Web. See Appendix 1 for a full list of Websites.

Bumb, B. (ed.). 2002. *An Action Plan for Developing Sustainable Agricultural Input Supply Systems in Malawi*. Muscle Shoals: International Fertilizer Development Center (IFDC).

Gisselquist, D., and C. Van Der Meer. n.d. "Regulations for Seed and Fertilizer Markets: A Good Practice Guide for Policymakers." Rural Development Working Paper 22817. Washington, DC: World Bank.*

IFDC (International Fertilizer Development Center). 2000. *A Strategic Framework for African Agricultural Input Supply System Development*. Muscle Shoals: IFDC.

References Cited

Bumb, B. (ed.). 2002. *An Action Plan for Developing Sustainable Agricultural Input Supply Systems in Malawi*. Muscle Shoals: International Fertilizer Development Center (IFDC).

IFDC (International Fertilizer Development Center). 1994. "Fertilizer Distribution Improvement Project-II (End of Project Report)." Dhaka: Ministry of Agriculture, Bangladesh.

IFDC (International Fertilizer Development Center). 2003. "Kosovo Agribusiness Development Program: Completion of Project Report, June 2000-January 2003." Muscle Shoals: IFDC.

This investment note was prepared by Thomas Thompson (IFDC), with input from Kees van der Meer, Gary Alex, and Sam Kane.

Getting Markets Right in the Post-Reform Era in Africa

Many small-scale farmers in low-income countries are excluded from markets for agricultural products and inputs because the costs and risks of market participation are simply too high. As a consequence, they often do not adopt new technologies to improve crop yields and natural resource management (NRM). Getting markets right is therefore a critical issue for increasing the food security and incomes of smallholder farmers and expanding smallholders' access to new market opportunities. Government investments are needed to create an appropriate institutional framework, address risk management, complete reforms, and invest in appropriate infrastructure.

Structural adjustments and economic liberalization have had a mixed and generally limited impact on improving the livelihoods of the poor, particularly in Africa. Producers do respond to market opportunities, but many markets function poorly even in the period following liberalization (box 7.25). The large markup from producer price to export price or, in the case of imported goods, from import price to final consumer price is a symptom of weakly functioning trade and distribution systems (box 7.26). In many places, these high transaction costs keep small-scale producers and the poor out of the market altogether. On average, only one-quarter to one-third of agricultural production reaches the market in Sub-Saharan Africa, and producers remain trapped in low-yield, subsistence production. Thus an important lesson learned in the aftermath of structural adjustment is the critical importance of moving beyond "getting prices right," which entailed the removal of policy distortions, to "getting markets right." Getting markets right involves creating an enabling environment for the private sector to operate and strengthening market institutions to reduce transaction costs and improve market performance.

Box 7.25 Producers' response to functional markets

In Mali, liberalization of the rice market led to a tripling of production over the 1990s, as small-scale processors and traders successfully halved the marketing margin from producer to consumer. In Kenya, liberalization of dairy markets caused dairy production to become the fastest-growing source of income for more than 600,000 small-scale farmers with one to three cows.

Where markets do not function, however, productivity gains do not translate into increased income. In Ethiopia, a quintupling of maize production since 1995 caused maize prices to collapse in 2002. In turn, farmers disengaged from maize production, and fertilizer application dropped by one-third.

Source: Authors

Investments Needed to Get Markets Right

The weakness of market distribution systems is partly a problem of poor infrastructure, particularly roads and communication systems. Road density was five times greater in India in the 1950s than it is in all of Sub-Saharan Africa today. But the poor distribution system also reflects the absence of key market support institutions, such as market information systems, grades and standards, contract enforcement mechanisms, and auctions and exchanges. Sales by order, forward contracts, and other more sophisticated

marketing arrangements are virtually unknown. Agricultural market development requires investment in:

- *Institutional framework.* Institutional changes are needed to support the development of competitive and efficient agricultural markets and increase small-scale farmers' access to these markets. Institutional innovation should reduce transaction costs related to market coordination, facilitate expansion of exchange outside of personalized networks, and enhance market specialization (box 7.27).
- *Risk management.* With the decline of public buffer stocks and price stabilization schemes, private risk management markets are emerging as an important force in coping with risk. Market-based instruments for managing risk (for example, forward and options contracts) enable producers and consumers to cope with an increasingly integrated global economy.
- *Full implementation of the reforms.* Full implementation of structural reforms will require more effort to follow through with liberalization and introduce other policy measures supportive of sectoral reforms.
- *Infrastructure.* Investments in key marketing infrastructure are needed to support agricultural production and marketing and improve small-scale farmers' and traders' access to markets. These investments can be based on public-private partnerships.

Box 7.26 Impact of transport costs

In much of Sub-Saharan Africa, the final price of agricultural goods is three to five times the price that producers receive. As an example, in 1995, although it cost only US$38 to transport one ton of maize from Kansas to the Kenyan port of Mombassa, it cost US$110 to transport that same ton from Mombassa to the town of Kisumu some 300 kilometers inland.

Source: Graeme Donovan, personal communication

Benefits

The welfare of the poor is intimately tied to their ability to acquire food and inputs efficiently from markets and to access output markets to generate cash income. The poor have little land, but they derive much of their income from agricultural production—ranging from 40 percent in Kenya to more than 80 percent in Mozambique and Ethiopia. Yet most of the rural poor are net food buyers. Africa's rural poor spend up to 40 percent or more of their scarce cash income on food. Research in Southern Africa has shown that improved food marketing policies in the early 1990s improved real household income by 7-13 percent among the poorest urban households and by up to 20 percent among the rural poor (Jayne et al. 2002).

Despite attempts to reform African agricultural markets, the development of a policy environment conducive to competition and private investment has remained elusive, and crucial market institutions remain rudimentary and weak. A significant proportion of small-scale farmers opt not to participate in markets because the costs and risks of market participation are simply too high. Thus investing in an institutional framework to make markets work, in private sector capacity, in risk management, and in appropriate infrastructure will significantly improve the welfare of the poor.

Policy and Implementation Issues

In the post-reform era, the fundamental market challenge facing developing countries is to understand how markets function, what roles different institutions play, and how to design, transfer, and maintain these institutions. Getting markets right depends on getting the underlying set of institutions right and on developing private sector capacity.

Box 7.27 Mali: "Silicon Mali"

Mali's success in establishing a market information system earned it the title of "Silicon Mali" from *Forbes* magazine in 2002. Mali's market information system (Observatoire des Marchés Agricoles) is based on enumerators visiting 58 markets around Mali and recording the high and low prices for grains, crops, and livestock. They enter these on laptop computers and e-mail the information by FM radio waves—all solar-powered equipment—to other regional offices where data are compiled and reports prepared for different types of producers.

The system, built up over a decade, has made Malian grain farmers more efficient, letting them know when and where to sell and for what price. With better information, the government can now rely on the private sector to shift surpluses to areas with shortages without resorting to foreign aid. Mali's information system has become a model for the rest of West Africa, where such countries as Niger and Burkina Faso are setting up similar systems that will be linked together. Soon farmers will be able to do more selling across national boundaries.

Source: Sansoni 2002

Defining the public sector role. Defining the appropriate role of the state vis-à-vis the private sector is critical to getting markets right. The failure of markets should not imply a reversal of market reform policies but rather signal a new role for the public sector in providing the institutions and infrastructure for the private sector to function.

Establishing dialogue with the private sector. Governments often are unwilling to engage the private sector in discussions and dialogue regarding the market, so the private sector operates without clear trust in or knowledge of the policy environment, leading to a vicious cycle of mistrust and inappropriate behavior.

Lack of private sector capacity. Private sector capacity is often a major constraint on market development. Most agricultural traders lack formal skills and trade finance. They operate small-scale businesses with few assets and trade only with people they know, in cash terms and over very short distances. Contracts are verbal. There is no legal system of enforcement. In countries such as Malawi and Ethiopia, two-thirds of traders cannot get bank loans, only six percent own a vehicle, and less than one-half have a telephone or permanent storage facilities.

Lessons Learned

Following market reforms in many countries, investments to strengthen market institutions have involved development of market information systems, vertically

integrated smallholder-to-export schemes, warehouse receipt systems, and smallholder associations. Little is known of the cumulative impacts of these investments.

Smallholder participation. A great deal of emphasis has been placed, rightly, on strengthening smallholders' participation in markets and on developing high-value export markets for smallholders. Several gaps remain in market development, however. Many interventions are relatively short-term, with an emphasis on quick results, without necessarily addressing the root causes of market failures. Root problems have to do with access to trade finance, human capacity in agribusiness and market promotion, logistics and supply chain management, and quality control.

Importance of domestic markets. While the great thrust of donor efforts has been on the development of export markets, domestic food markets remain undercapitalized, risky, rudimentary, and relatively thin, with little scope for forward contracting or quality differentiation. Development of viable domestic food grain markets requires investments in market, transport, and storage infrastructure, information systems, domestic grades and standards, and access to inventory finance. Increasing storage by smallholders and warehouse receipts systems can help to dampen the volatility of domestic markets.

Importance of market traders. Many efforts to develop agricultural markets have targeted smallholders directly, often bypassing or excluding other key economic actors, such as traders and processors. This strategy neglects the capacity of those already in the market (for example, small independent traders and food processors), who may be well placed to promote market activities. Building on the comparative advantage of traders is an important strategy for many market development efforts.

Contract enforceability. Very little emphasis has been given to the critical area of contract enforceability. Institutional innovation to reduce contract risk in domestic and export markets can build institutions that monitor trade behavior (for example, a credit referral agency or better business bureau), as well as mechanisms to ensure contract performance (for example, dispute settlement mechanisms).

Input distribution. Relatively little emphasis has been placed on input distribution, which is perhaps the area most adversely affected by market liberalization. Expansion of programs to improve input marketing and reduce the costs of fertilizer to smallholders must be explored further.

Warehouse receipts for rural finance. Because of difficulties in accessing adequate finance, farmers, traders, and processors have been unable to take advantage of opportunities created by globalization and market liberalization. Warehouse receipt financing is a possible solution. A warehouse receipt system allows farmers to store their products in a reliable warehouse until prices increase, using the product as loan collateral and accessing funds before they sell the product. Receipts are typically issued to producer groups rather than individual farmers.

Policy reform. Finally, at a more fundamental level, policies in many countries remain unfavorable and in need of further reform. Policy reform requires the development of

analytical capacity for market analysis and for devising ways of coping with a changing global economic environment.

Recommendations for Practitioners

Practitioners aiming to get markets right need to focus on developing private sector capacity and investing in the institutions and appropriate infrastructure to enable the private sector to function in areas of input distribution, domestic food grain markets, traditional export markets, and export markets for nontraditional, high-value products.

Policy-related investments must complete the implementation of market reform, with adoption of appropriate accompanying measures to alleviate the negative impact of reforms. This effort will require attention to maintaining credible and stable macroeconomic policies.

Institutional investments are needed to develop official systems of grades and standards for agricultural products, market information systems, and functioning systems of trade finance and warehouse receipts, as well as to institute dispute settlement mechanisms and legal reform. Market coordination can be facilitated through commodity exchanges and auctions and by supporting contract farming, outgrower schemes, farmer organizations, and traders' associations. Overall there is a need to promote effective governance and capacity building of state agencies for regulating and monitoring markets.

Risk management initiatives to help farmers cope with changing markets can include investment in information on market trends, forecasting future trends, and developing capacity to react to this information. Market chains will need to make greater use of instruments such as forward, futures and options contracts; in turn, farmers will require training and capacity building to use these instruments.

Infrastructure investments are needed to improve transport infrastructure, both in terms of transport fleets and roads, and mechanisms such as transport exchanges to coordinate logistics services and maximize the utilization of transport capacity. Other investments in telecommunications, particularly mobile communications, are needed to facilitate market information flows.

In sum, productivity gains brought about through research and technology diffusion must underlie the future African agricultural revolution. However, markets must play a key role in bringing technology, namely inputs, to producers and in enabling them to realize income gains from increased production. Making markets work for the poor in Africa is a critical challenge and pivotal to reducing poverty and hunger in Africa.

Selected Readings

Asterisk (*) at the end of a reference indicates that it is available on the Web. See Appendix 1 for a full list of Websites.

Gabre-Madhin, E. Z. 2001. *Market Institutions, Transaction Costs, and Social Capital in the Ethiopian Grain Market*. Research Report 124. Washington, DC: International Food Policy Research Institute (IFPRI).*

Kherallah, M., C. Delgado, E. Gabre-Madhin, N. Minot, and M. Johnson. 2002. *Reforming Agricultural Markets in Africa*. Baltimore: Johns Hopkins University Press.

References Cited

Jayne, T. S., J. Govereh, A. Mwanaumo, A. Chapoto, and J. K. Nyoro. 2002. "False Promise or False Premise? The Experience of Food and Input Market Reform in Eastern and Southern Africa." In T.S. Jayne, I. J. Minde, and G. Argwings-Kodhek (eds.), *Perspectives on Agricultural Transformation: A View from Africa*. New York: Nova Science.

Sansoni, S. 2002. Silicon Mali. *Forbes Global*, February 4. http://www.forbes.com/global/2002/0204/042.html.

This investment note was prepared by Eleni Gabre-Madhin (IFPRI), with input from Kees van der Meer, Gary Alex, and Sam Kane.

Food Safety and Agricultural Health

Food and agricultural products dominate the merchandise exports of many poor countries. For small countries in particular, wider participation in international trade is one of the important opportunities for economic growth, yet many developing countries lack the public and private capacity for managing food safety and agricultural health.[6] This lack of capacity forms a serious constraint not only to protecting human and agricultural health domestically but to accessing foreign markets.

Efforts to ensure food safety and agricultural health require a range of investments aimed at protecting human health and enhancing economic growth. Measures to build or strengthen a country's overall capacity to manage food safety and agricultural health may include institutional and legal reforms, raising awareness and promoting the use of "good" agricultural and postharvest practices, and/or investing in physical facilities, equipment, and other kinds of infrastructure. Because the particular mix of actions will depend on the conditions prevailing in a given country, project identification will require comprehensive analysis of a specific sector or product and an assessment of costs, benefits, risks, and opportunities.

Background and Context for Investment

Under the WTO Sanitary and Phytosanitary (SPS) Agreement, countries can restrict imports of agricultural and food products if necessary to protect human, plant, and/or animal health (box 7.28).

Box 7.28 The 1994 SPS Agreement

The SPS Agreement covers both food safety regulations and agricultural standards for animal and plant health, and it contains provisions for control, inspection, and approval procedures. It recognizes that member governments have the sovereign right to protect their citizens, but it also specifies that measures should be applied only to the extent necessary and should not arbitrarily nor unjustifiably discriminate against other WTO countries where identical or similar conditions prevail. A member country's food safety and agricultural health regime must be published and thus transparent, and notice of any changes must be given in writing to WTO. Members are encouraged to base their measures on international standards, guidelines, and recommendations, where they exist. The WTO recommends that members harmonize their requirements by using standards formulated by three international standard-setting bodies: the CODEX Alimentarius for food safety, the Office International des Epizooties (OIE) for animal diseases, and the International Plant Protection Convention (IPPC) for plant pests and diseases. Countries may use other standards, but they must provide a scientific justification for doing so.

[6] Food safety hazards include: foodborne microbial pathogens (such as *Salmonella* spp., *E. coli,* and *Listeria monocytogenes*) that occur naturally in the environment and may contaminate food through improper handling; animal diseases; parasites; mycotoxins; antibiotic or pesticide residues; and adulterants (such as dirt, glass, or heavy metals). Food additives, allergies, and the commercialization of biotechnology products—which are also raising questions for regulators—are not covered in this investment note. Agricultural health hazards include animal and plant pests and diseases that cause economic damage to crops or livestock or form a threat to human beings or the environment.

Source: WTO Sanitary and Phytosanitary Measures Agreement 1994

Over the years, food safety requirements have tightened following numerous food scandals and food scares; examples include bovine spongiform encephalopathy (BSE, commonly known as "mad cow disease"); high residues of pesticides, antibiotics, dioxins, and other toxic chemicals in the food chain; *Listeria*, *Salmonella*, and other microbial pathogen species; hepatitis; and more recently avian flu. Consumers have become more suspicious about the trustworthiness of food regulators, scientists, and the food industry, and in many countries this mistrust has translated into political pressure to strengthen public control. Recent fears of bioterrorism have only added to this pressure. As a result, food laws and regulations have been revised in the EU, Japan, the USA, and elsewhere (box 7.29), responsibilities have been sharpened, and border controls intensified.

Box 7.29 Food safety risks, standards, and requirements

Food safety regulations commonly require that levels of pesticides, veterinary drugs, and other harmful chemicals remain below a set maximum residue level (MRL) in food. Industrialized countries frequently cite violations of MRLs as the reason for rejecting imports (see, for example, the EU Rapid Alert site: http://europa.eu.int/comm/food/food/rapidalert/index_en.htm). For all foods of animal origin, including seafood, contamination with bacteria and other pathogens is the most important concern, leading to tight controls on the prevalence of pathogens, on freshness, and on hygiene at production sites, in processing plants, and during transportation. Zoonosis—animal diseases that present risks to human health, such as mad cow disease (BSE) and avian flu—easily lead to bans on trade. Another particular health risk comes from aflatoxins and ochratoxins, which are mycotoxins produced by fungi when certain products such as maize, coffee, and nuts are stored at high moisture levels.

Many animal diseases present no risk to human health but pose an economic risk for importing countries, because diseases may cross borders with infected live animals or animal products. Industrialized countries do not issue import permits unless exporting countries meet strong requirements for animal health surveillance and for ensuring the absence of certain diseases, such as foot-and-mouth disease. These requirements include the issuance of health certificates by the veterinary service of the exporting country. Plant exports are also subject to many requirements related to disease prevalence, surveillance, and pest control. Importing countries may require for each shipment a phytosanitary certificate from the national plant protection organization (NPPO) of the country of origin, which guarantees that imported products are free from certain pests and diseases. In many cases, countries require disease or pest risk assessments (PRAs) before permission for imports is granted.

Source: Authors

Food companies and traders—exporters as well as importers—experience heavy losses when stocks are discarded, supplies are interrupted, company and brand names are damaged, business is lost, or businesses go bankrupt. To manage these risks better, many food companies and industry organizations have developed their own food safety and

other protocols, often requiring their suppliers to obtain third-party certification for products and/or management systems.

One significant outcome of more stringent food safety standards is that supply chains are being restructured. A growing number of food companies manage food safety risks through increased control of the supply chain from farm to table. These companies abandon open markets, with their anonymous suppliers, and instead turn to vertically integrated or coordinated supply chains, with preferred suppliers (who assure safety through tracking and tracing) and independent certification of good agricultural and good manufacturing practices. These companies treat food safety as an opportunity to distinguish themselves from competitors.

Investments in Food Safety and Agricultural Health

Two basic principles that guide the development of food safety and agricultural health strategies in many countries are:

1. *Farm-to-table control*, covering risks at all stages of production, marketing, processing, and retailing, to reduce or eliminate foodborne organisms and residues in the food chain.
2. *Integrated safeguarding of agricultural health*, providing protection from exotic pests and diseases through exclusion, surveillance, control, and eradication, to protect domestic agriculture and reduce the economic impact of pests and diseases already established in the country.

These two principles emphasize preventive interventions at critical control points in the food chain and potential pest and disease pathways. These concepts are consistent with the shift from quality control of the end product to comprehensive monitoring of the whole supply chain. The corresponding key investments focus on improving capacities and the requisite technical skills for diagnosis, surveillance, inspection, certification, and establishing databases (box 7.30).

Benefits

A well-functioning food safety and agricultural health system has beneficial consequences for productivity, domestic and international trade, equity, and social well-being.

- *Public health.* Unsafe food forms a threat to human health. Protection against food- and waterborne health hazards reduces mortality, especially among children. The reduced incidence of disease will promote the ability to work and earn income and will reduce expenditures on drugs and medical treatment.
- *Agricultural health.* Systems that prevent the introduction of pests and diseases will protect livelihoods. The coconut leaf beetle, believed to have entered Vietnam in 1999, had infected about 5.6 million coconut trees with an estimated

loss of US$17.8 million by 2002.[7] In one highland community of Vietnam, avian flu has affected mostly smallholders, causing losses between US$69 and US$108 per family, a significant loss considering that most households in the area earn less than US$2 per day.

- *Poverty reduction.* Good food safety and agricultural health systems can have a major equity effect. Foodborne diseases mainly affect the poor, for example, and livestock diseases also have major consequences for poor people, because livestock are an important component of the livelihoods of an estimated 800 million rural poor (de Haan et al. 2001).
- *Trade.* While international trade in higher-value perishable foods (fresh fruit and vegetables, frozen fish, and meat) is growing relatively rapidly, compliance with increasingly stringent SPS measures poses important challenges for poorer and wealthier countries alike. For example, the prevalence of fruit fly prevents the export of practically all untreated fruits to U.S. and Australian markets, whereas the incidence of BSE has resulted in the interruption of huge volumes of trade in live animals, beef, and animal products.

Box 7.30 Potential policy adjustments and investments for food safety and agricultural

[7] *Manila Bulletin*, July 27, 2005 (www.mb.com.ph).

health

Design policy, regulatory, and institutional frameworks, including:

- Preparing strategic plans, while applying risk assessment and cost-benefit analysis to prioritize pests and diseases to control and actions to implement.
- Drafting basic laws and large numbers of related regulations and by-laws.
- Designing and strengthening basic institutions charged with managing food safety, animal health, and plant health.

Strengthen applied science capacity and facilities to perform such basic functions as:

- Diagnosis of plant and animal pests and diseases as well as food- and waterborne human health problems.
- Monitoring and surveillance of the prevalence of pests and diseases, as well as food- and waterborne human health problems, and assembling that information in databases.
- Laboratories to control the quality of pesticides, veterinary drugs, and other agrochemicals available in the market and to test food and other agricultural products for residues of agrochemicals and hazardous chemical contaminants.
- Laboratories to test food and other agricultural products for microbial contaminants and pathogens.
- Design and implementation of good agricultural practice (GAP), good manufacturing practice (GMP), and good laboratory practice (GLP).

Enhance private sector performance through support or co-investment in:

- Supply chain management ("from farm to fork") regulation and training.
- Hazard and Critical Control Point (HACCP) training.
- Systems for product traceability.
- Market information about import standards in export markets.
- Training in the appropriate use of pesticides and veterinary pharmaceuticals, and in hygiene for street food vendors and wholesale marketplaces.
- Availability of business development services.

Source: Authors

Policy and Implementation Issues

Institutional frameworks. Cooperation between government agencies is a universal challenge, especially in developing countries. Because of the complex, cross-cutting nature of food safety and agricultural health management, cooperation between agencies is especially critical in food safety. In practice, cooperation is often hampered by poorly defined and overlapping areas of responsibility, gaps, and bureaucratic competition. Better alignment of responsibilities is often a precondition for successful investment. Some countries (generally industrialized countries) have established a single agency for food safety and have separated policy setting, implementation, and monitoring functions. This separation of functions protects foods safety institutions from conflicts of interest between consumers and producers/processors and between policy setting and policy

implementation. Although a single agency has attractive aspects, there is no clear evidence that this structure will work better for developing countries.

Legal and regulatory frameworks. A need often insufficiently appreciated by foreign donors is the significant effort required to create a proper regulatory framework. Laws are often obsolete. Regulations for implementation and enforcement are missing. In some countries where the rule of law is absent, regulatory systems have evolved mechanisms for rent-seeking in inspection, testing, and licensing. The results include unnecessary controls, misdirected priorities, high costs of doing business, unofficial payments, vested interests in the status quo, and meager human and agricultural health outcomes.

Equity trade-offs. There are synergies and trade-offs between food safety and poverty. Although improvements in food safety benefit the poor through improved health and increased employment opportunities, the costs of controlling food safety in the informal sector can be excessive and outweigh the benefits. The application of controls and requirements for informal food establishments can drive small enterprises out of business while having limited impact on food safety. As a result, employment can decline, food prices can go up, and undesirable activities may become less easy to monitor. Yet by increasing the awareness of food safety and hygiene issues among consumers, primary producers, and micro/small business operators, and by promoting low-cost food safety techniques, there is ample scope both to include poorer producers in discerning supply chains and to enhance the safety of food (and water) consumed by the poor (box 7.31).

Distribution of costs. The costs of food safety and agricultural health services should be distributed among the different stakeholders based on economic criteria. If the main beneficiaries of the services (such as inspection and certification for export) are private individuals or groups, the service is a private good, and the beneficiary should carry the costs. If the benefits of a service affect society as a whole, the service is a public good to be funded by the public sector, although such services may be subcontracted to private service providers.

Regional cooperation. Certain activities—specifically, the control of animal diseases and the monitoring of plant pests and diseases—are most efficiently carried out in cooperation with other countries in a regional approach. Moreover, countries within a region may have expertise and resources to share. National preferences sometimes override the rationale for regional cooperation, however, and rather than advocating general cooperation, it may be more effective to address specific issues, such as common border protection and quarantine.

Box 7.31 Improving the safety of informally sold street food

The domestic market for food products remains among the least regulated markets for food

products in Uganda, and it is dominated by informal vendors who often operate outside the scope of official control systems. Poor water quality and unsanitary conditions in the food industry contribute significantly to foodborne illnesses such as cholera and dysentery. One recent survey found that tap water was commonly used in bottled water and juices.

Experiences from other countries demonstrate that low-cost measures to improve sanitation and water quality, combined with training and awareness programs, can reduce food safety hazards for consumers and improve livelihoods for vendors. One such program, developed by the Centers for Disease Control and Prevention (CDC), is the Safe Water System (SWS) Program, which sells bottles of dilute sodium hypochlorite at very low cost for household water treatment. The SWS strategy includes awareness programs to improve hygiene and water and food handling practices. At a cost to households of 1 US cent per day or less, the SWS has helped to reduce the risk of diarrheal disease by 22 to 84 percent, with an average reduction of 50 percent. Because the chlorine solution can be manufactured locally and inexpensively and then distributed through local commercial networks, it represents a replicable and low-cost measure that could be adopted easily by street food vendors to reduce the risk of disease from contaminated water.

In Zambia and Zimbabwe, the Natural Resources Institute funded a number of small projects to improve street food safety. These projects focused largely on reducing the incidence of foodborne illness by building awareness and providing training for food vendors and inspectors. In Ghana, promotional materials on food safety were used to educate consumers and food vendors. These materials included four television documentaries and billboards by the Food and Drug Board of Ghana, and posters and training manuals for Environmental Health officers and street vendors. Although these are small-scale efforts, they can be ramped up to the regional or national level to broaden outreach to a larger number of vendors.

Source: World Bank 2005

Lessons Learned

Make use of synergy from cross-cutting human, technical, and institutional skills. Food safety requirements can differ greatly between countries, between consumer groups within countries, and even between different uses of a product. All of these domestic and foreign demands make the management of food safety and agricultural health quite complex. Effective food safety and agricultural health systems depend on an array of professional skills—for example, in various disciplines of science, legal issues, commercial issues, and international relations—cutting across many government agencies and private entities. Although the capacities needed for boosting market access and food safety and agricultural health have distinct differences, significant synergies can be gained from using the same human, technical, and institutional skills.

Assess costs and benefits. Investment and operational costs are direct, tangible, and can be estimated, such as the costs of eradicating certain diseases or the costs of upgrading the facilities and management systems of fish-processing companies. The "costs" of inaction—for example, the risks of pest or disease outbreaks or of rejected food consignments—and the "losses" associated with being unable to access certain remunerative markets, are difficult to estimate ex ante. Both need to be taken into account, however. The same situation applies to the benefits from improved capacity,

institutional reforms, and other interventions. Some benefits are both predictable and quantifiable, including expected impacts on trade or animal productivity, incidence of illness, or loss of human life. Other benefits are much more difficult to anticipate and measure, including certain impacts on the environment, on worker morale or farmer incentives, or on the enhancement of a country's or supplier's reputation. Cost-benefit assessment is especially difficult for an aggregated set of interventions: it is more manageable in relation to specific products and policy interventions.

Emphasize public education and awareness. Among government policy makers, the widespread lack of awareness of international agro-food standards and/or appreciation of their impact on trade may possibly explain the limited emphasis and funding given to food safety and agricultural health. Among consumers and producers, the provision of knowledge and information on food safety and hygienic practices is a simple approach that may produce extensive benefits. The risk of food contamination and spread of diseases can be reduced through technical assistance to ensure proper food handling at all levels from farm to table (for example, basic training in hygiene for food handlers; information for consumers on avoiding food safety risks).

Recommendations for Practitioners

Develop a proactive strategy. A proactive or preventive approach requires an examination of potential opportunities and threats. It anticipates impending conflicts and focuses on sectors or products with a comparative advantage in a given market. It gives a country the flexibility to choose among alternative technical and administrative approaches to managing food safety and agricultural risks. For example, alternatives for minimizing pesticide residues in fruits and vegetables include promoting the use of more pest resistant plant varieties, the use of alternative pesticides, and/or the adoption of integrated pest management methods.

Conduct a comprehensive assessment and prioritization. In line with a proactive approach, and given the complexity and the many interrelated issues in managing food safety and agricultural health, the scant resources (both human and financial) available to most countries, and the numerous requirements of the SPS system, a comprehensive assessment is essential to:

- Accurately determine the bottlenecks to improving public health, agricultural health management, and competitiveness (sometimes there may be just one bottleneck for accessing an export market or improving a food safety issue).
- Identify single investments or investment packages (box 7.32).
- Clearly prioritize investment needs, based on qualitative and quantitative assessments of costs, risks, benefits, and opportunities.
- Enable policy makers to select appropriate technical, administrative, and regulatory measures.

Box 7.32 Vietnam's Sanitary and Phytosanitary (SPS) Action Plan

The World Bank has recently undertaken the preparation of a Food Safety and Agricultural Health Action Plan for Vietnam. A major part of the preparation consisted of consultations with all stakeholders involved in managing SPS requirements for cross-border trade, especially trade in fruits, vegetables, livestock, and fisheries products. The analysis looked at the entire production chain for these perishable products and examined the capacity of individual sectors—food safety, plant health, and animal health—for surveillance, diagnosis, risk analysis, and other activities. While emphasizing the need for more quantitative assessment, the Action Plan gives high priority to identifying and preventing animal diseases, followed by improvements in food safety. It highlights the importance of giving very early attention to identification and prevention strategies and building capacity, especially in risk analysis.

Source: World Bank 2006

Pay attention to sequencing. Certain capacities have to be developed before others can usefully be implemented. For example, surveillance requires good diagnostic capacity; risk analysis needs good database capacity; and improvements in laboratory facilities and equipment are interdependent with the development of human technical skills. The effectiveness of any of these measures depends upon improved awareness among primary producers, agroenterprises, regulatory officials, and others about the underlying importance of proper management of food safety and agricultural health risks, the possible techniques/approaches for doing so, and the specific roles, responsibilities, and accountability of all stakeholders.

Put within context of competitiveness. In most cases, capacities to deal with market access are not isolated but part of a broader weakness in competitiveness (lack of supply chain coordination or obstacles to exports aside from SPS). For this reason, supportive strategies are best put in the context of improving competitiveness.

Improve synergy among public and private capacities. Both public and private investments are essential. Some issues require a public solution, whereas for many a private response is more appropriate. Often, however, returns to investments depend considerably on the level of synergy between the two sectors. Investments in generic capacities of the government are of little use without a competitive private sector to use them effectively. Private investments may yield low returns or even be infeasible if minimal public infrastructure and services are absent, and if formal certification lacks the trustworthiness to gain access to foreign markets. For example, access to the EU market for fisheries products requires both (1) a suitable regulatory and inspection system, overseen by a (public) "competent authority," and (2) specific certification of individual fish processing/packing facilities as being compliant.

Ensure sustainability. Investment projects should incorporate provisions on sustainability. The poor sustainability of recurrent financing for food safety and agricultural health activities is a constant threat to both public health and food safety programs. The agencies involved usually suffer from insufficient funding and technical capacity. They lack the ability to make comprehensive plans and to show benefits from investments. Consequently their budgetary submissions are frequently ignored or discounted, except in the aftermath of a crisis, such as a major disease outbreak or the

interruption of trade with a major market. With their budgetary needs substantially unmet, these agencies frequently depend on support from donor agencies. Much of this support is also triggered by crises or is simply part of a broader regional program initiated by a donor. Without attention to financing the recurrent costs of services, much of the enhanced capacity supported by donors cannot be sustained beyond the time of the intervention.

Selected Readings

Asterisk (*) at the end of a reference indicates that it is available on the Web. See Appendix 1 for a full list of Websites.

Jaffee, S., and S. Henson. 2004. "Standards and Agri-food Exports from Developing Countries: Rebalancing the Debate." Policy Research Working Paper 3348. World Bank, Washington, DC.*

Josling, T., D. Roberts, and D. Orden. 2004. *Food Regulation and Trade: Toward a Safe and Open Global System*. Washington, DC: Institute for International Economics (IIE).*

Unnevehr, L., and N. Hirschorn. 2000. "Food Safety Issues in the Developing World." Technical Paper No. 469. World Bank, Washington, DC.*

World Bank. 2005. "Food Safety and Agricultural Health Standards: Challenges and Opportunities for Developing Country Exports." Report No. 31207. World Bank, Washington, DC.*

References Cited

de Haan, C., T. Schillhorn van Veen, B. Brandenburg, J. Gauthier, F. Le Gall, R. Mearns, and M. Simeon. 2001. "Livestock Development: Implications for Rural Poverty, the Environment, and Global Food Security." Washington, DC: World Bank.*

World Bank. 2005. "Uganda, Standards and Trade: Experience, Capacities, and Priorities." Draft paper prepared as part of the Diagnostic Trade Integration Study, World Bank, Washington, DC.

World Bank. 2006. "Vietnam Food Safety and Agricultural Health Action Plan." World Bank, Washington, DC.

World Bank. Website on Trade and Standards. http//www.worldbank.org/trade/standards

This investment note was written by Kees van der Meer and Laura Ignacio, with helpful comments from Cees de Haan, Steven Jaffee, and Iain Shuker.

Bangladesh: Autonomous Organization for Facilitating Market-led Export

What's innovative? An autonomous agency to facilitate market linkage and export competitiveness for producers and exporters in a young horticulture export industry.

The reduction of rural poverty in Bangladesh clearly requires improved agricultural growth and diversification into products, including export products, with higher income elasticities. This requires improved farm technology, both for intensification of food grain production (to release land for higher-value crops) and to enable farmers to grow diversified crops, for which Bangladesh has a comparative advantage. Bangladesh has very limited experience in commercial horticultural production and marketing, however, and lacks extension systems that can provide improved production technologies and marketing information for export horticulture.

Project Objectives and Description

The goal of the Agricultural Services Innovation and Reform Project is to raise agricultural productivity and incomes through production intensification and diversification, supported by more demand-driven and locally responsive agricultural services. The project provides support through a quasi-private organization (HORTEX) to pioneer horticultural production and export activities that emphasize contract farming with NGOs or private entrepreneurs using participatory approaches to extension.

HORTEX is an autonomous, nonprofit, facilitating organization that is not itself commercially involved in production and export. A managing director and a governing body consisting of 11 members—three from the government, one from the central bank, five from the private sector, and two from NGOs—provide the management structure.

HORTEX works with private entrepreneurs, NGOs, and government agencies to forge productive alliances and provide catalytic technical services, combined with limited investment, in export operations that may operate at a loss until adequate export volumes are developed. HORTEX provides assistance in grading, packaging, quality control and export logistics; assists in marketing; facilitates contracts with overseas interests; and explores potential joint venture investments.

In its first season of successful operation (1998), HORTEX arranged with an NGO for contract production of French beans, identified interested buyers in Europe, selected appropriate varieties, developed and contracted for supply of export-quality boxes, trained NGO extension staff, and organized export logistics. HORTEX initially bore the costs of seed, fertilizer, and cartons as demonstration costs. Based upon analyses of market opportunities and domestic production possibilities and constraints, HORTEX has identified other potentially profitable products such as chili peppers, okra, bitter gourd, yard long beans, and baby pineapple. These products include both new export commodities and traditional exports. For traditional exports, quality has historically been

poor, packaging has not conformed to international trade standards, shelf life has been limited, and prices have been low. For these commodities, HORTEX facilitates entry into nontraditional markets and improves returns from traditional markets by introducing improved production practices, postharvest handling, and packaging to improve quality and reduce spoilage.

HORTEX organizes trial shipments of new products or of traditional products to new markets, such as Singapore and the Middle East. While the HORTEX business plan provides a basis for operations, flexibility is maintained to adjust for market developments and interest expressed by importers in particular products. In later stages of the program, HORTEX is likely to concentrate more on quality monitoring and promotion of Bangladeshi horticultural products. Its future role might include the establishment of a recognized trademark and reputation for Bangladeshi products, leading to long-run profitability. Evidence of success will be measured by the number of NGOs and private entrepreneurs that can export profitably without HORTEX services.

Benefits and Impacts

Strengthened partnerships among NGOs and the private sector have resulted in improved extension services that enable farmers to undertake highly profitable, diversified production activities. Market-oriented penetration of export markets has yielded higher farm incomes, with benefits accruing mainly to the poor and with significant multiplier effects throughout the local economy.

Lessons Learned and Issues for Wider Applicability

- As farming systems become more complex and market demand becomes increasingly sophisticated, agricultural extension systems need to become more decentralized to reflect location- and market-specific issues.
- Cooperation between a technical agency with access to international marketing experience and NGOs that have gained the trust of small-scale farmers can be extremely useful in introducing new higher-value crops in a country dominated by small-scale farmers.
- Agencies adopting a catalytic role (for example, HORTEX) should focus on providing critical technical services rather than making direct investments in infrastructure.

Country	Bangladesh
Project Name	Agricultural Services Innovation and Reform (HORTEX Component)
Project ID	P058468
Project Component Cost	US$2.4 million
Dates	FY 2000 – FY 2003
Contact Point	Wahida Huq The World Bank , G.P.O. Box 97, Dhaka 1000, Bangladesh email: Whuq@Worldbank.Org

China: Smallholder Cattle Development for Import Substitution

Livestock raising is a large part of the household farming system in China, with farm families traditionally keeping a few animals, mainly pigs and chickens, for sale and home consumption. Beef production has mainly been from cattle that have outlived their usefulness as draft animals.

What's innovative? Developing markets and market linkages to enable smallholders to respond to a growing market demand for safe, high-quality beef.

Over the last 20 years, per capita meat consumption has increased from 0.4 to 2.4-3.0 kilograms per year, while domestic production has increased at only half that rate. The increased demand for quality beef cannot be fully satisfied, owing to generally weak infrastructure in marketing, slaughtering, and processing and a weak market information system linking producers, processors, and commercial buyers. There is an urgent need for a better-integrated system involving forward and backward linkages among producers, processors, and buyers.

Project Objectives and Description

The Smallholder Cattle Development Project aims to (1) improve smallholder cattle production within crop farming areas by using surplus crop by-products and (2) improve the quality and marketability of cattle to enhance farmers' incomes and reduce poverty.

The project supports the government policy of developing the beef cattle subsector in response to emerging market demand for quality beef and of developing meat production systems that do not use grain. The project puts special emphasis on assisting smallholders, who have surplus labor and crop by-products but are constrained by low productivity and the poor quality of their cattle operations. The project involves improvements to animal husbandry technology and processing and marketing infrastructure. Strengthening the commercial infrastructure to link production and markets through the development of live-cattle markets, processing facilities, market information services, and quality assurance programs is an innovative component of this project.

The Market Linkage Development component aims to provide linkages from producers to cattle markets. The project supports the construction of nine small markets for live cattle that act as centers for trade and market information as well as places to access technical knowledge and veterinary services. They give farmers a competitive alternative to direct sale to slaughterhouses and processors.

The project also supports the construction, expansion, and rehabilitation of five cattle slaughterhouses and processing plants to expand markets for farmers and provide value-adding opportunities. These processors provide key linkages between production and final-product markets by producing quality beef of specified grades on delivery schedules

required by end markets. This result is achieved through integrated planning and management by processing facilities, feedlots, and farmers. Processors match supply and demand on a year-round basis through their purchasing and storage activities. Contracts specifying the quantity to be supplied and date of delivery are negotiated between processors and farmers with payments based on quality, schedules, and grades. In this way, farmers and feedlots receive essential signals about the type and quantity of beef required. The net result is a production response in which farmers produce beef of the quality demanded by consumers, grading standards are used, and the product is presented and packaged to customers' specifications.

The entire process provides an avenue for inducing farmers to respond to markets. The information collection system gathers market information and feeds it back to cattle markets, feedlots, processors, local bureaus of animal husbandry, and farmers. The participating slaughtering and processing enterprises use beef grading and assurance programs and work toward achieving the HACCP or ISO-9002 best-practice level. Introduction of a quality-based differential beef pricing system serves as an incentive scheme for small-scale farmers to produce improved cattle.

Benefits and Impacts

The project provides employment for about 3,000 people through the development of nine cattle markets, 130 feedlots, and five processing enterprises, and it provides additional employment opportunities in the rural economy through general commercial development. The development of improved markets and linkages to consumers has increased producers' incomes, expanded on-farm employment opportunities, and improved the supply of safe, high-quality beef to local consumers. The improved information system enables producers to respond more effectively to consumer demand and thus has improved their competitiveness in relation to foreign producers. The improved quality assurance in meat inspection, food safety, and processing technology has reduced the health risk from unhygienic handling of beef and reduced food safety risks to consumers.

Lessons Learned and Issues for Wider Applicability

- A market-based orientation is essential to compete with international suppliers, particularly for China and other countries that have recently joined the WTO or other trade agreements.
- Contracts must be based on demand in end-markets and have clear quantity and quality specifications, with transparent payment schedules. Specific mechanisms must be included for contract enforcement, although compliance is best assured through well-aligned incentives that benefit both parties to the contract.
- For meat and other fresh foods, it is essential that accepted food safety practices are followed strictly at all stages in the supply chain, that appropriate testing procedures are followed, and that auditing systems are established.

Country	China
Project Name	Smallholder Cattle Development (Market Development Component)

Project ID	P045264
Project Component Cost	US$25.45 million
Dates	FY 1999 – FY 2006
Contact Point	Mohamed N. Benali The World Bank 1818 H Street NW, Washington D.C. 20433 Telephone: (202) 473-7357; Email: Mbenali@worldbank.org

Colombia: Productive Agribusiness/Farmer Partnerships

What's innovative? Building sustainable win-win partnerships between rural producer organizations and agribusinesses.

Liberalization of the economy, coupled with an overvalued peso and falling world prices for commodities, have led to fundamental changes in the composition of Colombia's agricultural production. However, the rural population's limited education and business skills, the high cost of and limited access to capital (particularly for smallholders), and the prevalence of rural violence have impeded smallholders' ability to capitalize on these changes. The challenge facing the rural sector is to increase its competitiveness in a free market economy. The government's strategy is to promote farming systems that combine both perennial crops (agroecological conditions permitting) with subsistence and annual crops and animal husbandry. This strategy is expected to allow farmers to reduce debt levels, diversify risk, and increase employment and incomes.

Project Objectives and Description

The Productive Partnerships Support Project seeks to establish economically viable and sustainable partnerships between agribusiness and organizations of small-scale producers, by providing an integrated package of incentives and assistance. Demand-driven, sustainable, productive partnerships are expected to generate income and employment opportunities for participating small-scale farmers. A "productive partnership" is any collaborative arrangement between a small-farmer organization and an agribusiness that reduces technical, commercial, financial, and/or social risks; increases productivity; and produces income gains in a value chain in ways that benefit all parties.

Project implementation is based on three principles: (1) the (limited) responsibilities of the public sector are specifically defined; (2) the execution of project activities is completely decentralized and transferred to the private sector; and (3) participation of stakeholders is structured through a clear distribution of roles and responsibilities, based on the recognized competencies and capacities of each party. Operational procedures are designed to provide transparent rules, clear eligibility criteria for identification of beneficiaries and allocation of resources, an efficient flow of funds, and adequate supervision.

Participation of relevant stakeholders at the strategic level of the project is ensured by including representatives of the financial sector, agricultural producer organizations, and small-farmer organizations in the National Technical Committee, which ensures that the project is implemented consistently with the agreed conceptual and technical design. A Coordination Group (consisting of a team of dedicated professionals with relevant disciplinary backgrounds) reporting to the Committee conducts a public information campaign, selects productive partnership ideas (which are presented jointly by the prospective participants), arranges the contracting of Technical Assistance Providers to

facilitate preparation and implementation of productive partnerships, and establishes agreements with partnership representatives for administration of incentive programs.

The project supports the implementation of productive partnerships by financing cost-sharing transfers as a financial incentive for participating producer organizations. It also finances technical assistance and training for participants in productive partnership. The incentives can be used for *farmers* to access output markets and inputs (for example, high quality seed or credit for working capital). They also help *agribusinesses* to expand food processing activities by securing supplies from small-scale producers whose products meet predetermined quality standards, without the need to expand own production capacity.

Specific applications may include: on-farm infrastructure, such as irrigation canals, aquaculture facilities, greenhouses, and storage facilities; durable goods, such as machinery, equipment, tools, and fences; vegetative materials for nurseries; operational inputs, such as fertilizers and approved chemicals; services such as land leveling; special studies, surveys, laboratory analyses, and inventories; insurance; publicity and market and communication services; labor, usually in the form of remuneration to the beneficiary or family (this is particularly important for organic crops); and purchase of land (financed from counterpart funds). The maximum value of the incentive is 40 percent of the required investment.

Technical Assistance Providers (NGOs or consulting firms) help to prepare productive partnership proposals and to implement approved partnerships. Development of clear schedules of incentives is a key part of the project, and it is essential to the sustainability of the partnerships.

Benefits and Impacts

The development of productive partnerships between agribusinesses and small-farmer organizations has improved smallholders' access to input as well as output markets. Farmers' range of production alternatives has increased, along with the profitability of diversification alternatives. In conjunction with these changes, rural employment has increased, a broader range of production systems has been established, ecological sustainability has improved, and the financial and agroclimatic risks associated with agricultural production have been reduced. Agribusiness investment in the sector has improved the provision of new technologies and the linkages between farmers and the markets they serve.

Lessons Learned and Issues for Wider Applicability

- A flexible, open design is needed for programs with local governments, given the great diversity in capacity and socioeconomic conditions. An impartial group (such as the National Technical Committee Consortium) is extremely important to adapt implementation to the dynamics of each particular location.
- The process of designing partnerships should be highly participatory, drawing on the contributions of municipal governments and local small-farmer organizations.

- Proper mechanisms must be set in place to provide participating farmers with independent sources of technical assistance to counterbalance dependence and excessive monopoly situations in relationships between suppliers and buyers.
- A simple monitoring and control system should be in place from the start of the operation to identify and correct problems rapidly. It is advisable to separate monitoring and evaluation functions and to rely on an independent agency to conduct periodic impact evaluations.
- Clearly defining contractual, arbitration, and conflict resolution mechanisms as well as operational, monitoring, and supervision procedures can ensure transparency in financial transactions and encourage the provision of matching grants by the government.

Country	Colombia
Project Name	Productive Partnerships Support
Project ID	P041642
Project Cost	US$52.3 million
Dates	FY 2002 – FY 2008
Contact Point	Pierre Werbrouck The World Bank 1818 H Street NW, Washington D.C. 20433 Telephone: (202) 473-0745; Email: Pwerbrouck@worldbank.org

Mali: Building Mango Export Systems

What's innovative? An autonomous agency improving supply chain coordination and linking smallholders to export markets for horticultural products.

Mali relies on an agricultural system centered on a few major crops (cereals, rice, and cotton) produced by many smallholders. High production risks and poor productivity contribute to the high incidence of rural poverty. Most smallholders have diversified their production systems to include horticultural crops as complementary cash crops in the off-season, but diversification into export crops such as mangos has been constrained by limited research and extension services, unorganized and inadequate logistics infrastructure, and a lack of information about market requirements.

Demand for mangos is growing in European markets, and Mali is well positioned to produce them. The Agricultural Trading and Processing Promotion Agency, an NGO established as an autonomous body under the Chamber of Agriculture in accordance with a government agreement, undertook to design and implement a project to promote Malian mango exports. The Agency was formed to restructure supply chains, develop marketing channels, and promote the application of research and technology.

Project Objectives and Description

The primary objective of the Agricultural Trading and Processing Promotion Project was to improve the supply chain for mango exports by filling the gap left when the public sector withdrew from the market and by strengthening links between small-scale producers and markets. Related objectives included developing new channels for trade (especially sea-freight logistics) and encouraging crop diversification. More generally, the project aims to significantly increase the volume of mangos exported. On the production side, this goal is to be achieved by improving product quality to meet market requirements; on the marketing side, it is to be achieved by resolving transportation bottlenecks through improved sea-freight logistics.

The Agency identified a Côte d'Ivoire enterprise willing to set up a joint venture and share risks. It guaranteed a fixed price to the importer, who bore the logistic and commercial risks associated with exporting the product. The Côte d'Ivoire partner is liable for (1) financing fruit purchases from growers and packaging material at the pack-house and (2) securing forward and inland logistics. Fixed prices include a profit margin for each party. If the average selling price exceeds the fixed amount, the additional profit is split equally.

The Côte d'Ivoire partner assigned two experienced pack-house managers (administrative and packing) to implement proper packing, accounting, and shipping procedures. The Agency has acted as an intermediary between the producer associations and their trading partners. It also provides a number of extension services to growers and pack-house employees to increase productivity, reduce costs, and improve quality. Key intermediaries are involved in technology transfer to growers. Producer associations

assist with training and technical assistance, as well as pooling production and negotiating contracts.

Services to support production are related to agricultural inputs, quality management, conservation techniques, harvesting techniques, seedling sourcing, varieties, orchard restructuring, quality control and certification, and national regulations. Services to support commercialization include organization of the marketing participants, training in export standards, logistics improvement, and financing.

The Agency's agribusiness centers, which exhibit the Agency's products for growers, exploit new information technology to offer a reference center and access to an Internet café. Local radio programs, as well as technical books on tape (many villages have a cassette recorder running on batteries), are also used to disseminate information. Given the low local literacy rates, a key future challenge will be to develop management information systems and traceability management systems to track production.

Benefits and Impacts

Benefits include profitability for all partners; reduction by half in transit time to Northern Europe; higher-quality products delivered to customers; access to new European markets; timely payments to growers; farm income diversification; training of the rural labor force; introduction of improved technologies; 25 percent higher prices for growers; increased pack-house employment (60 percent of employees are women); and improved pack-house working conditions and pay.

Lessons Learned and Issues for Wider Applicability

- Successful export systems must establish linkages between farmers and their markets to enable farmers to satisfy and adapt to market demand.
- Incentive structures between partners (particularly between growers or grower associations and agribusinesses) must be designed to minimize enforcement problems.
- Efficient and reliable cold chain infrastructure is essential to ensure product quality. Multimodal shipping containers (fitted with specialized equipment to maintain refrigeration) are important, but use of this technology must be complemented by good logistical planning to ensure minimal delays.
- Quality control is critical for perishables, especially for exports to the EU, which requires high compliance levels. All chain participants must receive training on quality standards and market requirements, and internal control systems must be installed at collection and processing sites.
- Integrated technical and extension services for production, processing, and distribution are essential for improving supply chain coordination and efficiency.

Country	Mali
Project Name	Agricultural Trading and Processing Promotion (Mango Export Component)

Project ID	P001755
Dates	FY 1995 – FY 2003
Contact Point	Patrick Labaste The World Bank 1818 H StreetNW, Washington D.C. 20433 Telephone: (202) 473-4999; Email: Plabaste@worldbank.org