



SECTION 4

Discussion of Individual Tools

INTRODUCTION AND OVERVIEW

This section presents 13 value chain implementation tools. They are presented in six themes within a program implementation cycle. Figure 4.1 illustrates how the focus of each tool and theme relates to a program implementation cycle. The themes, and a brief explanation of the tools that fall within them, are shown below:

THEME ONE: DESIGNING STRATEGIES AND BUSINESS PLANS—OBTAINING AND USING INFORMATION

Tool 1: Choosing Priority Sectors for Value Chain Interventions

Helps practitioners consider: Which are the priority value chains? Which ones should be supported? Why does comparative advantage matter, and how can it be assessed? How should public, private, and collective perspectives and interests be harnessed?

Tool 2: Designing Informed Strategies across the Value Chain

Offers analytical methods for understanding the value chain and integrating the information into sound strategy along various points of the chain.

Tool 3: Conducting Benchmarking and Gap Assessments of Value Chains

Describes how to measure and compare a value chain's performance (whether in relation to itself, similar value chains, or to best practices) as a means of gaining insight into appropriate strategic choices.

THEME TWO: DEVELOPING ROBUST NEW BUSINESSES

Tool 4: Upgrading and Deepening the Value Chain

Describes ways to add efficiency, improve product quality, and add new operations to increase value added within the value chain.

Tool 5: Identifying Business Models for Replication

Focuses on opportunities to implement sound business models repeatedly within a value chain. The ability to replicate these business models is useful in increasing value-added volumes, intermediation, and access to services and inputs.

THEME THREE: SUPPLYING THE MARKET—ALIGNING SUPPLY TO MATCH MARKET OPPORTUNITY

Tool 6: Capturing Value through Forward and Backward Integration

Explains how vertical integration can help businesses ensure supply or otherwise control inputs, capture more value, achieve economies of scale, and/or ensure access to information.

Tool 7: Horizontal Collaboration—Creating and Taking Advantage of Economies of Scale

Provides approaches to create economies of scale that help to increase production, ensure quality, improve access inputs, and achieve more market power.

THEME FOUR: REACHING THE MARKET— MARKET POSITIONING AND MARKET OPPORTUNITIES

Tool 8: Positioning Products and Value Chains for Greater Value and Competitiveness

Describes how competitiveness positioning considerations can enable businesses to choose wisely, market value chain business models, and provide strategic direction to many value chain actions to improve competitiveness.

Tool 9: Applying Standards and Certifications to Achieve Greater Quality

Describes how meeting (and exceeding) the quality and performance standards of desired markets can help achieve entry, market share, and higher unit values for a value chain's products.

THEME FIVE: IMPROVING THE BUSINESS AND POLICY ENVIRONMENT

Tool 10: Identifying needed support services for the value chain

Discusses how improving the depth and breadth of services offered to a value chain can help member firms to be commercially sustainable and improve operations.

Tool 11: Improving the Operating Environment by Promoting Public-Private Dialogue

Describes how value chains can improve their operating environments by engaging the public sector and other actors in effective public-private dialogue.

Tool 12: Achieving Synergies through Clustering

Demonstrates how cluster-strengthening and cluster-development initiatives can help value chain participants achieve results that an emphasis solely on core value chains may not be capable of generating.

THEME SIX: MONITORING RESULTS IN VALUE CHAIN DEVELOPMENT

Tool 13: Monitoring achievements in value chain performance

Explains how monitoring and evaluation methods can help value chain participants track implementation progress, evaluate value chain performance, and identify the impacts of initiatives.

Each of the tools presents value chain-based actions that can form part of a competitiveness-focused agriculture development initiative. Figure 4.1 presents a sequencing in which these tools will typically be employed over the life of a project.

The tools were selected to provide a broad range of interventions across and within the value chain and its operating environment. The thoughtful reader will recognize that many other tools are available and could be described, or that any one of the included tools could be considered in much greater depth. Several of these could easily command their own volumes—for example:

- Market-based approaches (segmentation, marketing, and promotion)
- Logistics as a tool
- Managing the distribution chain
- Branding (that is, connecting differentiation with standards and with service qualities)
- Workforce and skills competitiveness
- Jumpstarting value chains

However, this Guide provides a highly functional entry point to the field of value chain analysis and is well illustrated by examples specific to African agribusiness.

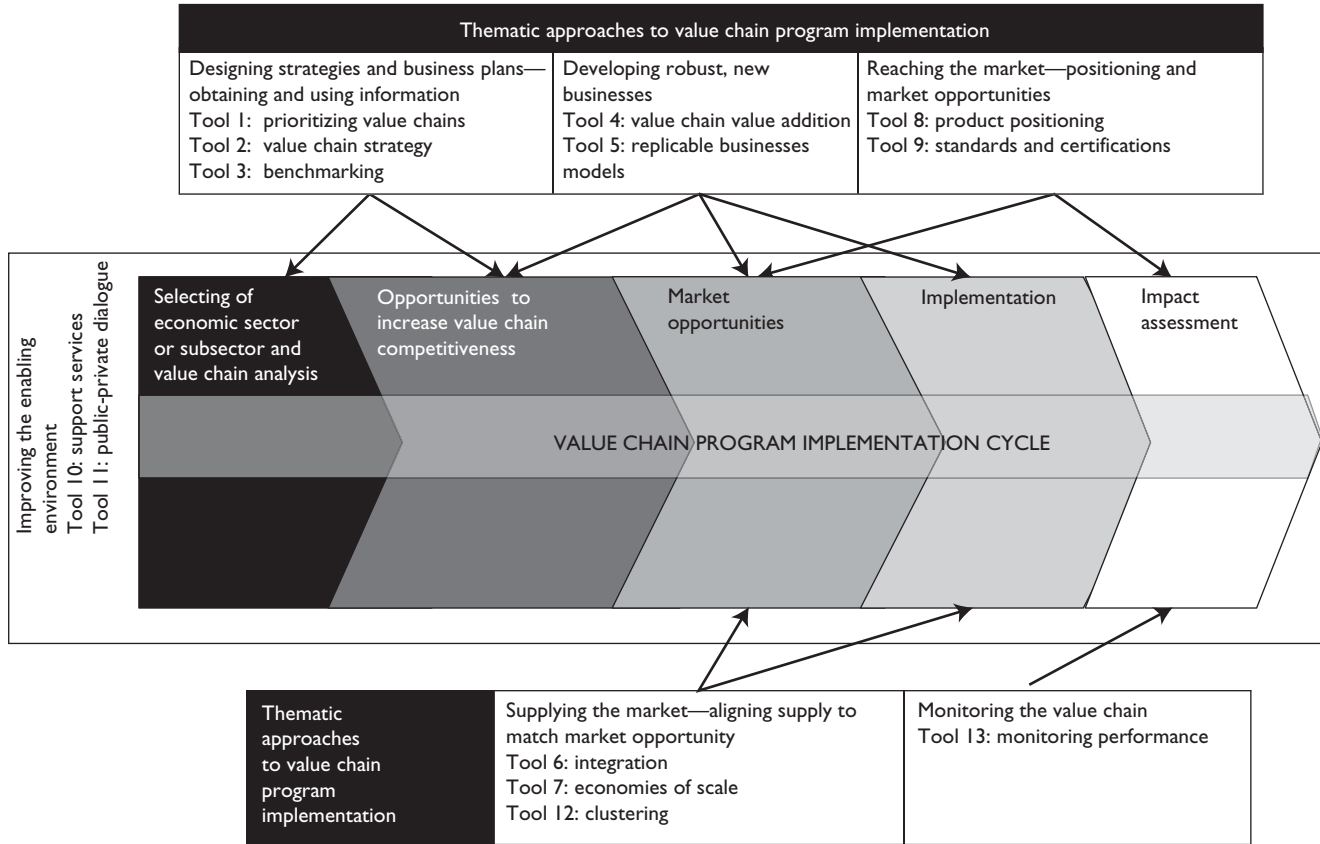
While the Guide's emphasis is on implementation, actions are likely to be most effective when underpinned by sound information and analysis. Therefore, we begin with three largely analytical tools relating to choosing priority sectors, designing informed strategies, and conducting benchmarking and gap assessment.

The base of practical analysis provided by these three tools is an important input or prerequisite for many of the implementation tools.

Each tool is followed by descriptions of one or more actual cases that illustrate the tool's application. Embedded mini-cases offer additional illumination.¹ Most of the examples are from Africa, others are from Europe, Latin America, and Asia. We return to the same cases as appropriate when describing different tools, which serve to highlight the multiple dimensions of a single value chain and the rich set of opportunities value chain initiatives can offer.

Figure 4.1 Value Chain Program Implementation Cycle

The value chain framework: A program implementation cycle showing the sequences in which various tools can be employed over the course of a project^a



Choosing Priority Sectors for Value Chain Interventions

This tool describes how investors, governments, donors, and other organizations can prioritize among the value chains when considering investment possibilities. The process can help businesses and domestic or foreign investors to determine where they can invest most profitably and can help planners in the public sector and development partner organizations to select which value chains to support.

In most cases, the process will start with an initial list of potential value chains based on a general definition of product category and target market(s), followed by various types of market analyses, an evaluation of the operational and strategic opportunities and their potential impact, and a willingness assessment of the chains' leaders and other stakeholders to work toward improving their collective competitiveness.

This process does not necessarily need to be carried out in a linear fashion. In fact, involving various stakeholders in the early stages of the analysis is an excellent means of gauging (and building) their willingness to invest time and resources in the resulting initiatives.

In the case of governments and donors, the process assumes that the program has not prescribed beforehand which value chains it must support. Such preselection should be avoided. Selecting before testing can distort incentives and project dynamics among stakeholders, effectively limiting the project's prospects for a meaningful impact.

The discussion within this tool is not intended as an exhaustive list of criteria upon which value chains can be prioritized. It should be considered a guide for businesses, planners, and practitioners to identify which value chains offer the best opportunities to invest profitably, encourage economic growth, and enhance competitiveness. Each business or practitioner can add criteria depending on their particular focus. Additional typical criteria include involvement of small and medium enterprises, variability of returns, gender considerations, and environmental impact. A multicriteria

approach is, in fact, a commendable approach to filtering alternatives.

INITIAL LIST

To begin, it is helpful to compile a list of combinations of product category, target market, and resulting value and supply chains that could become more competitive and thus enhance economic growth, exports, and/or incomes of intended beneficiary groups. Narrowly speaking, and often perhaps too simplistically, competitiveness in such cases is simply interpreted as being able to sustainably export at a profit, or to compete favorably against imports (in a way that increases productivity and, hence, the incomes of affected populations).

There are many sources from which an initial list of products can be compiled. These include consultation with experts, previous assessments, products in industry sectors that have been identified as national priorities, and sectors being supported by other initiatives.

In addition to these sources, quantitative tools that rely on the concept of comparative advantage are often used to refine and prioritize the potential list of products and value chains. The comparative advantage concept focuses on the relative efficiency of producing different goods in the home country or region compared with the rest of the world. It must be emphasized, though, that the fact that a product possesses comparative advantage does not necessarily mean that it can be produced and sold at a profit under prevailing economic conditions. Many other elements need to be in place—including appropriate marketing links and input supply channels, financing mechanisms, uniform product quality, and many other demand requirements. In other words, comparative advantages can be built into competitive advantages.

To identify products or chains with a comparative advantage, practitioners have often used the revealed comparative advantage (RCA) index. The RCA denotes relative efficiency

indirectly, based on trading patterns that emerge from actual market transactions. RCAs identify the extent to which an exporting country captures world market share in a particular area relative to the degree to which it captures export market share for all traded goods.¹ An RCA greater than 1.0 indicates a comparative advantage for that item, while an RCA lower than 1.0 identifies a comparative disadvantage.

The RCA is, however, imperfect because it embodies not only the fundamental economic factors affecting relative efficiency but also government policies and institutions that may distort markets. The usefulness of RCA indexes is also limited because they indicate past performance but do not take into account current market dynamics and likely future trends and conditions in those markets. Nor does the traditional RCA take sufficiently into account the key role of transport availability and cost for many exportable products. As long as these imperfections and limitations are recognized, RCAs can be helpful as analysis tools, since data are generally available in the trade record to gauge comparative advantage.

An alternative measure of comparative advantage is the Domestic Resource Cost (DRC) coefficient, which compares the cost of domestic production with world prices. The DRC measures the dollar cost in domestic resources of earning or saving a net dollar of foreign exchange. Therefore, values below 1.0 indicate a comparative advantage and values above 1.0 a disadvantage. To the extent that a country persists in producing commodities whose DRCs are greater than one, its resources are being poorly utilized. The country would have little chance of increasing exports of those items or increasing domestic production to substitute for imports, since they are inherently noncompetitive on world markets. Therefore, policies that encourage the production of products without a comparative advantage tend to drag down the country's agricultural growth rate and opportunities for employment creation.

Perhaps more importantly, DRCs can be compiled in such a way that disaggregates cost data by productive stages along the chain. Presenting data in this manner illustrates how income is distributed among the different links in the value creation process and allows for the analysis of other weaknesses and inefficiencies in each link. Tool 2 demonstrates how to use and benefit from this information.

A drawback of DRCs is that the data required to calculate them are often not readily available for many commodities. The calculation of DRCs requires data on domestic prices, international prices, government subsidies, and taxes for the specific commodities being evaluated, as well as the shadow price of foreign exchange. In addition, these indicators require information about the proportion of tradable and

nontradable inputs used to produce one unit of each particular good. Given these requirements, it is difficult to assemble such detailed data for all but a few commodities in a limited number of countries. DRCs, though, are often the preferred indicators of comparative advantage when the focus of attention is restricted to a few commodities and/or trading areas. However, since DRCs are estimated on the basis of certain production conditions, their results most likely do not apply countrywide (Norton and Balcazar 2003). And once again, transport costs and availability are not formally reflected, yet can be quite important.

Box 4.1 demonstrates how an initial list was chosen for a project in Senegal.

The RCA and DRC approaches provide useful but incomplete information and guidance. Thus, they must be tested using a sensitivity analysis—testing different assumptions to see how and to what extent the outcomes change—and considered in the light of other important decision criteria. Among these criteria are market strength, domestic capacity, and level of commitment.

MARKET ANALYSIS

Market analysis to examine the nature of demand—its size, tendencies, segments and potential niches due to seasonality and other factors, price tendencies, customer preferences, current competitors, market access, and other requirements—is particularly important in prioritizing product/value chains. A market analysis allows the investor, business, or planner to identify whether attractive opportunities to improve and upgrade a given value chain exist, using market conditions as the benchmark of what needs to be achieved.

DOMESTIC CAPACITY AND ECONOMIC IMPACT

Once an initial list of potential product/value chains has been vetted by confirming market opportunities, program implementers can evaluate the capacity to respond competitively to those opportunities, as well as the extent to which upgrading and change are needed to be able to produce according to market requirements and customer preferences. This evaluation involves the analysis of institutions, technology, service providers, policies, and other production conditions, in addition to the investments needed to take advantage of the identified opportunities. An assessment of capacity also provides guidance as to important program intervention points, where the opportunities available within the target value chain can be leveraged or unleashed.

Box 4.1 How to Choose Value Chains for Intervention: The Example of Senegal's *Projet Croissance Economique*

Before a detailed analysis can be performed to determine the most appropriate subsectors on which to focus interventions, planners must generate a list of possible subsectors from which to choose. The selection of items for the list can be conducted informally—for example, brainstorming the obvious sectors in a country or basing the list on the most widely grown crops. Or the process can be more rigorous such as in Senegal, where a more deliberate approach was taken to identify the list of possible target subsectors.

Senegal's *Projet Croissance Economique* is a five-year program supported by USAID^a that began in 2005. The aim of the project is to help Senegal stimulate accelerated growth, competitiveness, and trade. Its initial work has focused on improving the value chains of a number of products produced in Senegal in order to achieve greater production and productivity, higher prices, and increased exports. The project's approach is to ensure that Senegalese stakeholders are engaged at every juncture along the production process so that improvements are sustainable.

At the start of the project, the government of Senegal, donors, and a consulting firm collaborated to create an initial long list of possible value chains on which to focus interventions. This initial list included many subsectors, but through a sequential refinement process, the list was shortened to six subsectors. This process involved five stages:

- 1) **Mandatory sectors:** If the government prioritized development of a subsector, it was automatically given strong consideration. These priority subsectors were identified based on government policies that emphasized the subsectors because they were considered vital to the country, had high value added, or were import substitutes. Using these criteria, cotton and horticulture-related products were priorities.
- 2) **High economic impact sectors:** Next, subsectors with extensive economic impact on the country

were given priority. The team looked for subsectors with perceived competitive advantage, perceptions of high impact on rural incomes and employment, or export market potential, including sectors potentially benefiting from the U.S. African Growth and Opportunity Act (AGOA). Cashews, mangoes, dairy, and bissap (hibiscus tea) were identified through these criteria.

- 3) **Sectors with private sector appeal:** Finally, the team looked at subsectors that were of interest to private enterprise, were already a focus of the private sector, or that had a high likelihood of attracting private domestic and foreign direct investment. Banana production for export was already targeted by private sector investors, and export of neem seed to the United States (where it can be used as a raw material for organic agriculture inputs) was promoted by a foreign investor, so those subsectors were also considered priorities.
- 4) **Applying additional criteria:** Supplementing the criteria highlighted above were cross-cutting themes like poverty reduction, women's empowerment, and employment creation. The final short list that was created included six subsectors: mangoes, cashews, bissap, fonio (a small millet), woven textiles, and fisheries.
- 5) **Value chain analysis and feasibility analysis:** Next, a value chain analysis and feasibility analysis were conducted to verify soundness and opportunities, to determine which three of the initial six subsectors would be selected for the interventions, and to guide the nature of the particular value chain emphasis within each sector. Cashews, bissap, and mangoes were the initial choices.

This project is now in its fourth year. As it has progressed, changes in market opportunities have caused the list of selected subsectors to be expanded to include bananas, gum Arabic, neem, and dairy.

Source: Carlton Jones and Martin Webber, J. E. Austin Associates, Inc.

^a Implemented by a consortium including International Resources Group and involving J. E. Austin Associates, Inc.

Further, given the market analysis and the opportunities identified, practitioners are able to construct scenarios of the economic impact (profits, jobs, increased exports, and wages) that the proposed changes would have.

TESTING COMMITMENT

It is essential to take into account the commitment of the chain's leadership and stakeholders when deciding which value chains to prioritize. Stakeholders must be willing to

invest time and resources to achieve the identified opportunities for upgrading. Their motivation will rest on many factors, including their understanding of the likely returns, the time and level of investment required, perceived risk, and the leadership of opinion leaders and champions. It is generally a good idea to include stakeholders in the process as early as possible and conduct workshops to discuss the current conditions of the product/value chain. Their commitment to the process can be gauged by their repeated attendance, expressed enthusiasm, and commitment to resources. Their level of responsiveness will help practitioners prioritize value chains.

A STEP-BY-STEP SUMMARY OF TOOL 1: CHOOSING PRIORITY SECTORS FOR VALUE CHAIN INTERVENTIONS

- Start the prioritization process by compiling an initial list of products/chains whose competitiveness could further be enhanced. Sources for an initial list include experts, sector reviews, previous assessments, national priorities, and sectors supported by other initiatives.

- Add to or refine the list using quantitative tools, such as revealed comparative advantage and domestic resource cost coefficients, to assess comparative advantage.
- Conduct market analysis to identify if attractive opportunities to improve and upgrade a given value chain exist.
- Evaluate the capacity to respond competitively to those opportunities. Construct scenarios of the economic impact that the proposed changes could achieve using multiple assumptions about profits, jobs, increased exports, and wages among other variables.
- Make the stakeholders part of the process as early as possible, especially through workshops to discuss the current conditions of the product/value chain and to test their willingness and commitment to the process.

NOTE

1. The formula for calculating the RCA index of a given product (p) is $RCA_p = (x_p/X_p)/(x_t/X_t)$; where X_p are total world exports of product (p), x_t stands for total country exports, and X_t for the world total of all kinds of exports.

CASE STUDY I

Prioritizing Value Chains by Using Comparative Analysis—Value Chain Selection in Mozambique

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INTRODUCTION

In the early 2000s, Mozambique was set to receive International Development Association (IDA) loan funds from the World Bank for a targeted agricultural program. In preparation, the parties agreed to carry out a study to identify the agricultural sectors with the greatest comparative advantage, as a method to prioritize from among a wide range of possible sectors. This case study uses the first tool to decide which specific value chains in Mozambique are the best candidates for intervention. It illustrates how the DRC can help decision makers select among value chain options.

POINTS TO CONSIDER

When reviewing this case, it is important to consider the following points:

- What are the steps involved in comparative analysis?
- Which method of comparative analysis was employed, and why?
- How do differing assumptions change the outcome of the analysis?
- How does information from the analysis shape future interventions?
- What limitations are there in a DRC-type analysis? How can the analysis be supplemented?

BACKGROUND

Mozambique is a largely rural country located on the southeastern coast of sub-Saharan Africa. After gaining independence from Portugal in 1975, Mozambique adopted a socialist economic system and later plunged into a civil war that lasted over 16 years. Peace was established in the early 1990s, providing a foundation for economic recovery.

More than 75 percent of the population relies on agriculture for their livelihoods, although less than 20 percent of the arable land is cultivated, and yields of all major cash crops are low. Seventy percent of the population lives on less than US\$1 per day, and one-third suffers from chronic hunger.

Table 4.1 presents the major Mozambican commodities (2005).

In 2005, an agricultural economist was commissioned to perform an analysis for a targeted agricultural program to be implemented with loan funds from the World Bank, which culminated in a report entitled “Economic Analysis of Comparative Advantage for Major Agricultural Cash Crops in Mozambique.”¹

CREATING AN INITIAL LIST

Before the comparative study could be conducted, a list was generated that included possible sectors for intervention.

Table 4.1 Mozambican Commodities by Price, 2005

Rank	Commodity	Production price (Int \$1,000)	Production volume (mt)
1	Cassava	443,169	6,150,000
2	Maize	168,490	1,450,000
3	Indigenous cattle meat	78,296	37,856
4	Pulses	54,382	205,000
5	Groundnuts in shell	53,156	110,000
6	Rice, paddy	42,815	201,000
7	Indigenous chicken meat	40,472	34,698
8	Sorghum	38,305	314,000
9	Cashews	38,108	58,000
10	Coconuts	23,967	265,000
11	Tobacco leaves	21,879	12,000
12	Vegetables, fresh	19,703	105,000
13	Fruit, fresh	18,344	115,000
14	Cow milk, whole, fresh	16,049	60,350
15	Indigenous pig meat	12,977	12,815
16	Bananas	12,826	90,000
17	Hen eggs	12,156	14,000
18	Potatoes	11,604	80,000
19	Tea	11,366	10,500
20	Oilseeds	8,789	30,000

Source: FAOSTAT data.

The original list was prepared by World Bank staff and focused on sectors linked to domestic priority crops.

The list was vetted by the Office of Commercial Agricultural Sector Promotion within GPSCA (Gabinete de Promoção do Sector Comercial Agrário), a department of the Mozambique Ministry of Agriculture. GPSCA felt that potatoes and paprika were very relevant in the Tete Province. The World Bank and GPSCA agreed to remove tobacco and flowers from the list and replace them with these sectors (see table 4.2).

Table 4.2 Original and Revised Sectors for Intervention in Mozambique

Original list	Revised list
Cashews	Cashews
Rice	Rice
Tobacco	Potatoes
Flowers	Paprika
Cotton	Cotton
Export fruits, (bananas and grapefruit)	Export fruits, (bananas and grapefruit)
Sugar	Sugar

Source: J. E. Austin Associates, Inc.

THE ANALYSIS

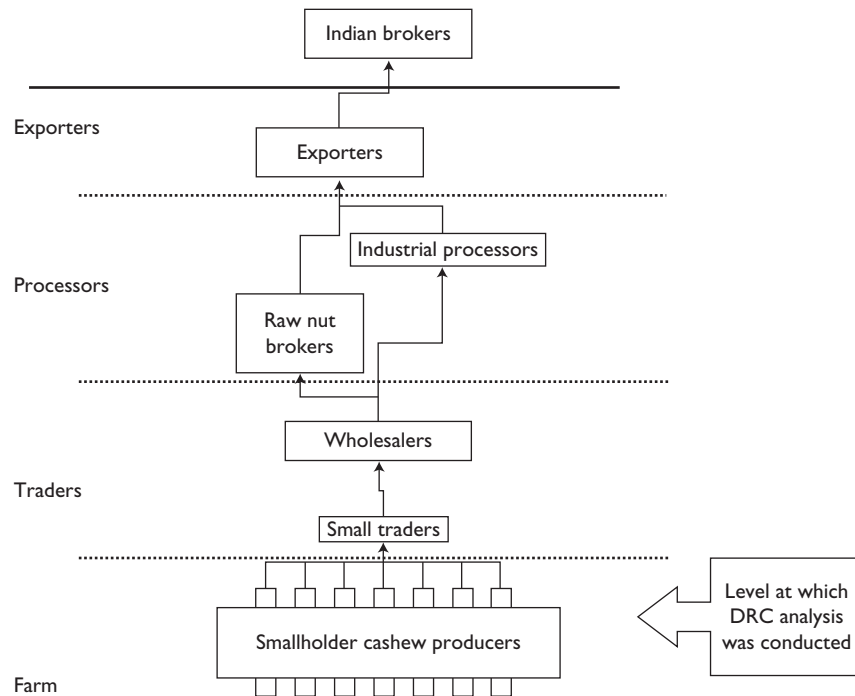
As previously described, there are two principal means to determine the comparative advantage of an agricultural sector: RCA and DRC. Of the two, the RCA method is the easier to use because it relies on trading patterns that emerge from actual market transactions to indirectly indicate relative efficiency; the data required are typically readily available. However, the RCA method requires data on international market transactions that were not available for Mozambique. Also, the RCA method paints a picture of past performance but does little to take into account future trends.

DRC and RCA are helpful tools, but they alone should not determine which value chain is selected for intervention. These tools should be used in conjunction with other analyses and scenarios that when combined make the best case for desired and successful outcomes.

The parties decided to employ the DRC method (see figure 4.2).

DRC is highly dependent on selected cost and other assumptions that, when changed, can affect outcomes. For example, real outcomes may vary in cases where unpredictable

Figure 4.2 Mozambican Cashew Domestic Value Chain



Source: J. E. Austin Associates, Inc.

costs determine value chain profitability. In such instances, flexible cost assumptions allow stakeholders to glean the correlation between outcomes and actual costs. Assumptions regarding other variables, such as location, access to inputs, or extension and training, will similarly affect the accuracy of DRC estimates.

Note: The value and limitations of this particular DRC analysis came into focus more recently as investment flooded into the sugarcane subsector of Mozambique, despite its being tagged in the following findings review as fundamentally uncompetitive in the study region. This subsequent investment highlights the fact that a given DRC is specific to a region and a moment in time. DRCs do not tell us about competitiveness on a national level, which was the driver of that later investment, nor do they tell us how the competitiveness of one region will change over time.

FINDINGS

The results of the sector comparison are below. Note that DRC values below 1.0 indicate a comparative advantage, and values over 1.0 indicate that resources are being poorly utilized:

- **Cashews:** The cashew sector possessed the highest comparative advantage, with a DRC coefficient well below 1.0, at 0.10. Local processing contributes two-thirds of

total value added to the product, so local processing is desirable for exporting raw nuts. Cashews also provide a significant profit (32.8 percent) to producers.

- **Rice:** At present, neither of the local rice varieties (Chokwe and Zambezia) are financially or economically profitable, but with technical assistance and credit access schemes, this could be changed. The Chokwe and Zambezia DRCs are both higher than 1.0; with interventions they could achieve coefficient below this value.
- **Potatoes:** Although they command low prices, potatoes are profitable and have a comparative advantage thanks to low production costs. The potato DRC is 0.36, but with interventions to improve yields via better inputs, it could be improved slightly.
- **Paprika:** This crop is somewhat profitable for farmers, but better pesticide and fertilizer interventions could increase profitability. Yields could be increased with the further extension of credit schemes that allow for more input purchases. Paprika profits are lower than those of tobacco and potatoes, which are the two competing crops in the region. However, paprika has a comparative advantage at the farm and export levels. Its DRC is .58.
- **Cotton:** In comparison to other agricultural crops, cotton is not profitable due to relatively high family labor requirements. However, in some cases, cotton is slightly profitable,

and is the only option for growing a cash crop. This profitability is very fragile, however, as it depends on world prices for cotton, which fluctuate. Cotton's DRC is .76.

- **Export fruits (bananas and grapefruit):** Grapefruit is highly profitable in economic and financial terms. Bananas, on the other hand, are barely profitable in financial terms and generate an economic advantage only when taxes are eliminated. Grapefruit's DRC is .15, banana's is .40.
- **Sugar:** Sugar is not economically profitable but possesses a slight financial profitability because of domestic subsidization. Sugar has the highest DRC at 17.04. It is hoped that, through existing interventions, it can be lowered to .99 by the year 2012.

Of the seven sectors and eight cash crops studied, cashews possessed the lowest DRC (.10), with the grapefruit following close behind (.15).

The study noted that several sectors (rice, potatoes, paprika, and bananas) could have different profitability and DRC levels if technical assistance or different sets of inputs were available. This highlights how DRC can be a useful tool, but should not be the only determinant for sector selection. DRC use should be weighed in light of the assumptions used to complete the analysis. Even though cashews have the lowest DRC, it could be determined through further analysis that, for example, the relative cost of intervention for another product might make that other crop a preferable fulcrum for interventions.

OUTCOMES

The Mozambican Ministry of Agriculture refers extensively to this report for planning and analysis. The report also serves as a useful reference for further exploratory research.

CONCLUSIONS AND FUTURE STEPS

Markets with the best comparative advantage were identified based on well-considered cost and other assumptions.

However, the user or interpreter of DRC analysis should bear in mind the importance of recognizing that when assumptions are changed, the relative desirability of outcomes may change as well. DRC analysis provides important insights and a basis for comparing the profitability of value chains but should not be the sole tool used for sector selection. Complementary analytical tools should be employed to ensure that differing outcomes are identified and considered. For instance, DRC does not take into account market opportunities. Combining a market assessment with DRC analysis facilitates more informed decisions on agricultural interventions.

As the World Bank continues supporting agricultural projects in Mozambique, more DRC analyses can be conducted to ensure the data sets remain current, especially with respect to labor costs. Recommendations for future analysis include working with the Ministry of Agriculture's Policy Analysis Department to validate and/or update production costs and prices used in the previous comparative analysis report. It will also be worthwhile to extend the analysis to other cash-producing agricultural sectors such as livestock, fiber, and fuel crops and to conduct regional level studies to show impact in areas where agricultural projects are underway (Gergely 2005).

NOTE

1. The analysis was conducted and the report was prepared by Nicolas Gergely.

CASE STUDY 2

A Structured Value Chain–Based Approach to Designing a Strategy of Agricultural Competitiveness and Diversification in Mali

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INTRODUCTION

In 2005, the government of Mali, with the support of a US\$46.4 million loan from the World Bank, launched the Agricultural Competitiveness and Diversification Project (PCDA) in hopes of diversifying the country's agricultural income into markets with clear competitive advantages for Mali. The project team identified target sectors for support by comparing Mali's agricultural sector using a series of analytical tools with a broad range of data. Through this process, the team identified value chains for export markets, which provide a basis for import substitution, improve livelihoods for Malian small growers, and contribute to Mali's GDP.

POINTS TO CONSIDER

When reviewing this case, consider the following questions:

- How did the PCDA team's approach to sector selection differ from other analytical approaches?
- If time and resource are factors, which steps are necessary and which can be set aside?

APPROACH TO VALUE CHAIN ANALYSIS AND SELECTION

The government of Mali and the World Bank enlisted the Geomar International Group,¹ a Canadian-based global

consulting firm, to assist with the project's sector review component, which used five modules to assess Malian agricultural competitiveness. Each module built on the previous and helped practitioners progress from a comprehensive list of sectors to those with true marketability, competitive advantage, and comparative advantage. This process also took into account the demand in existing end-markets, identification of new potential end-markets, regional climate and growing factors, production capacity, access to finance, and infrastructure, and other determinants.

Module 1: Defining Mali's broad portfolio of agricultural value chains

- Step 1:1* Create a comprehensive list of agricultural value chains in the country, including informal ones.
- Step 1:2* Categorize each value chain using criteria that defines its particular storage and/or delivery needs, such as perishable, semiperishable, durable, transformed, semitransformed, or processed.
- Step 1:3* Classify each value chain based on potential end-markets, such as export markets for consumption or processing, regional markets for consumption, or local markets for consumption.
- Step 1:4* Summarize the structure of the various value chains by organizing the categories defined earlier, incorporating upstream-downstream relationships and key factors of value addition.

Module 2: Analyzing market demand and market entry conditions

- Step 2:1* Create a market demand data sheet for every value chain listed in module 1, providing a comprehensive snapshot of that chain's viability and market opportunities.
- Step 2:2* Chart opportunities in each end-market for all identified classifications. For example, identify European markets for perishable product/value chains intended for export markets, including value and quantity. Do the same for other end-markets and sector classifications.

Module 3: Analyzing the competitiveness of potential Malian offerings

- Step 3:1* Determine the production potential for each sector using information from the first two modules. Add data on number of producers, production, farm yields, unit price, and revenue.
- Step 3:2* Analyze regional potential based on comparative advantages. Map the key production regions to determine target areas for select agricultural products, highlighting geographic advantages (for example, access to water or growing seasons); constraints (for example, distance from main markets, distance from Bamako for transport, pollution, or poor climate); and producible crop sectors.
- Step 3:3* Create subregional identification sheets that present annual rainfall, temperature, sun exposure, and humidity for each subregion to determine the suitability of crop selection.
- Step 3:4* Illustrate the growing months and seasonal market demands for all products to show areas of opportunity for producers based on their production cycles and periods of crop availability.
- Step 3:5* Conduct an analysis that shows constraints and subsequent interventions that would improve value chain competitiveness.

Module 4: Defining priority sectors

- Step 4:1* Prioritize value chain criteria by triangulating the interests of various stakeholders. Rank the priorities for each value chain based on production sophistication, number of solvent operators that could be integrated into the strategy, strategy

duration, social impact, market appropriateness, existing professional organizations, and existing programs.

- Step 4:2* Create a matrix that identifies priority sectors. Put priority levels from the final stage of step 4:1 in columns, and categorize the rows based on various end-markets. Insert sectors into their respective boxes, thus identifying the sectors with the highest probability for success and impact. The matrix can be used to balance strategies for a variety of sectors.
- Step 4:3* Organize the priority sectors by area using the regional analysis conducted in module 3 that shows which value chains should be implemented in which regions of the country. This table also provides an at-a-glance view of the crops that can be grown in several regions.
- Step 4:4* Create a reference index showing growth and economic impacts for certain priority value chains, highlighting all indicators used during the previous modules of the analysis.

Module 5: Competitiveness planning: putting the analysis into action

- Step 5:1* Determine which approach will improve the competitiveness of the sectors in question. In this instance, the team recommended that Mali's competitive strategy include short-, medium-, and long-term objectives, each with pragmatic and obtainable interventions.
- Step 5:2* Address the issues with solutions, taking into consideration the constraints highlighted in module 3 and their associated investment needs. For example, "Improve technical skills and human productivity by introducing new technologies and training facilities."
- Step 5:3* Wrap the entire strategy together by providing implementation guidelines and a framework that encompasses standard, specific activities that fall under four stages: provisioning, production, logistics, and marketing. Overlap these stages with cross-cutting activities.

LOOKING AHEAD

The value chain strategy that the team recommended to Mali is currently being implemented. About 10 value chain

competitiveness strategies and action plans have been developed and are being implemented. In committing to these strategies and actions, Malians will have invested in a strategy that takes into account the many elements of value chain analysis that have often been overlooked in previous strategies. This, in itself, will prove to be beneficial in increasing the institutional knowledge, not only for the

government, but also for all stakeholders taking part in the implementation of PCDA.

NOTE

1. Geomar International Group was acquired by SNC-Lavalin in 2006.

Designing Informed Strategies across the Value Chain

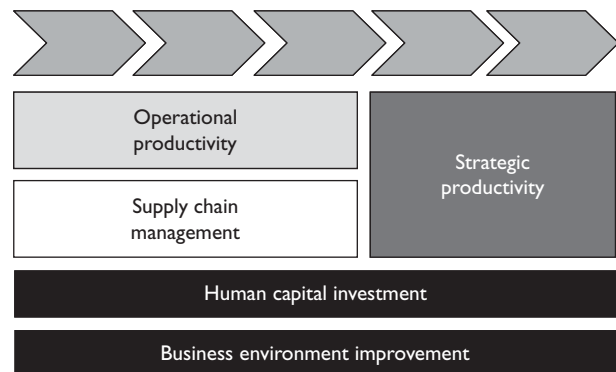
A strategy is an integrated set of choices about the markets a firm or set of firms should serve; how to compete in each market; and how to allocate resources to the most valuable production, marketing, and support activities. In increasingly integrated regional and global markets, firms don't merely compete against firms—value chains compete against value chains. Increasing productivity and competitiveness requires a comprehensive strategy. In vertically integrated industries, firm strategy and value chain strategy are synonymous. However, in fragmented supply chains, buyers, suppliers, and intermediaries must work together to increase their productivity and to raise the value of the end product.

This section outlines a selection of fundamental analytical tools for understanding the quality and efficiency of a cascading series of activities that increases value added.¹ A vast set of tools exist that can be used to describe, analyze, and evaluate the value chain. Several are highlighted here to demonstrate the types of analysis and information that typically guide the strategies and actions to enhance the productivity of a value chain (see figure 4.3). Since the analytical tools outlined below are point-in-time assessments, they should be updated on a frequent basis to ensure that any changes in the market dynamics or performance of the business are quickly integrated into a new strategy.

ENHANCING VALUE CHAIN PRODUCTIVITY

Competitiveness is determined by the productivity (value per unit of input) with which a firm or value chain uses its human, capital, and natural resources. Productivity depends on the value, uniqueness, and quality of a product, in addition to the efficiency with which it is produced. Productivity can be strategic, as well as operational, in nature. The overall productivity of a value chain can be segmented into various components, each of which can be analyzed and addressed in concrete, tangible ways to increase the overall return to businesses within the

Figure 4.3 Enhancing Productivity and Value across the Value Chain



Source: J. E. Austin Associates, Inc.

chain.² The graphic above and the more detailed explanations below outline a framework and key questions that can be used for analysis and evaluation in guiding the development of a comprehensive, integrated value chain strategy.

Assessing the overall status of the value chain

An awareness of the distribution and flow of profits in the value chain is fundamental to understanding the relationships among and behaviors of each segment, as well as the opportunities for increasing productivity and profit across the chain of activities. Information should be collected at each segment of the chain: for instance, the number of enterprises; number of employees; unit labor costs; unit input costs; unit sales, marketing, and distribution costs; annual volume sold; annual sales revenue; unit price; and net profit.

Figure 4.4 illustrates a standard value chain, or value system analysis and graph. This analysis is the quantitative building block for understanding the cascade of value-added activities in a particular industry. By summarizing the price build-up for each activity in the chain, the graph tracks the distribution

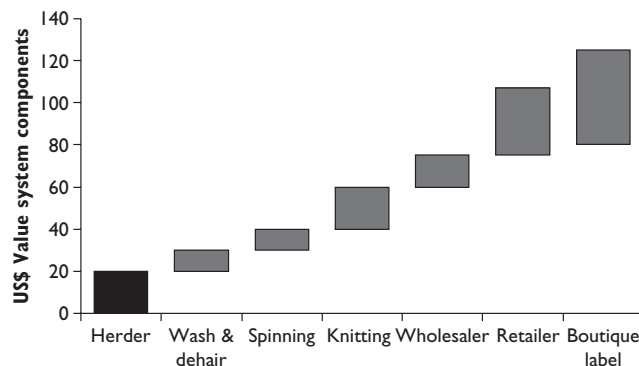
Value Chain Data

At each segment of the chain, the following information should be collected:

- Number of enterprises
- Number of employees
- Unit labor costs
- Unit input costs
- Unit sales, marketing, and distribution costs
- Annual volume sold
- Annual sales revenue
- Unit price
- Net profit

Source: J. E. Austin Associates, Inc.

Figure 4.4 Mongolia: Net Revenue per Kilogram of Cashmere for Each Component of the Value System



Source: Nathan Associates Inc. and J. E. Austin Associates, Inc., for USAID.

of net revenue for one unit of a good from raw material to point of sale. It is important to note that this graph does not incorporate costs at each activity, and so does not give any insight into the market economics and profitability of each activity. It is useful when mapping the roles of each segment and the incremental value that the market assigns each role based on additional inputs and services to the product.

The example in figure 4.4 depicts the build-up of the net revenue of one kilogram of Mongolian cashmere from herder to retailer. Over 60 percent of the value of the end product is captured by the knitting, wholesaling, and retailing activities.

SWOT analysis

Complementing the value system analysis above, a SWOT (strengths, weaknesses, opportunities, and threats) analysis is

the general, qualitative starting point for any competitiveness strategy or other analysis for decision-making purposes (see figure 4.5). While the SWOT analysis is not a very precise tool, it is a good way to provide a general characterization of the current state of the industry, identify issues, and generate discussion. It is particularly useful as a neutral facilitation tool to focus an initial discussion on the perceived state of the value chain or to perform initial brainstorming on the potential opportunities and risks.

SWOT analysis is simple and can be used at differing levels of focus (examining a single firm, a segment of the chain, or the chain overall). It is also a good way of identifying areas to examine in greater detail. Thus, it is an excellent analytical starting point.

It is important to identify the right focus for the SWOT analysis and to keep the discussion on point. SWOT analysis is not an effective tool for identifying alternate strategies, nor is it terribly rigorous. It is, therefore, most valuable when supported by other forms of analysis rather than as a standalone tool.

Once a broad overview of the structure and characteristics of the value chain has been established, a more in-depth understanding of the drivers of productivity is required to uncover the highest-value strategies to raise productivity in the value chain.

Using the competitiveness diamond

The Competitiveness Diamond³ is a more rigorous analytical tool for evaluating an industry or value chain. The Competitiveness Diamond framework has been validated by numerous analytical and case studies and is now used by industries and governments worldwide to assess industry cluster competitiveness and to develop strategies for improving competitiveness. It is structured around four pillars:

1. Factor (input) conditions: skilled labor, infrastructure, and others
2. Demand conditions: size and type of accessible demand
3. Related and supporting industries: presence of supplier and supporting industries
4. Context for firm strategy and rivalry: conditions for conducting business

Within each sector and across the economy, these four pillars interact to form a foundation for building a competitive system of firms. For developing economies like those in Africa, building a competitive value chain starts with understanding the demand for products and services in key markets and then organizing and investing in the factor inputs

Figure 4.5 Pakistan Dairy SWOT Analysis

<p>Strengths</p> <ul style="list-style-type: none"> • Large population and high per capita consumption of dairy products, ahead of other regional markets in Asia. • A high ratio of agricultural land to agricultural population. • Large aggregate supply and breed potential of indigenous cattle/buffalo. • Regular culling of less productive/unproductive animals. • Internationally cost-competitive farm types already exist in Pakistan. • Willingness of processors to develop infrastructure linking them to the farmer because of consumer preferences against reconstituted milk. • Larger and smaller processors are willing to invest given the right support. • Central geographic location with easy access to large, potential regional markets. 	<p>Weaknesses</p> <ul style="list-style-type: none"> • Consumers are price sensitive and ignorant of quality requirements. • Significant cost variation in milk production across sizes and types of farms. • Poor quality of milk. • Middlemen operating without regulations leading to significant value destruction. • The existence of the bandi system (under which the middleman predetermines the producer's sale price for the entire year at the rate most beneficial to him). • Low animal productivity, no breed management, and little productivity support services to farmers. • Farmers not organized, general lack of able management structures in sector. • Poor quality of animal health care and breeding services. Support structure and industry are not well developed to support animal productivity. • Seasonality leading to fluctuations and uncertainty in feed supply and quality. • Underdeveloped cold chain to consumers. • Poor physical infrastructure. • Small-scale and fragmented animal holdings. • Lack of remunerative producer price for milk. • Low utilization of installed capacity of dairy plants. • Lack of a well-defined national policy for dairy development.
<p>Opportunities</p> <ul style="list-style-type: none"> • Consumption can be increased with the right emphasis on nutritional value, quality, and price. Capitalize on traditional nutritional value placed on milk and related products. • Exploit potential to improve animal yield through better feed availability and breeding. Potential to maintain/establish feasible, larger farms. Interest in investing in larger model farms. • Induce productivity and quality specific farmer cooperation around collection and possibly milking, and support efficient collection at larger scales. • Develop extension services model based on NRSP to promote farmer cooperation. • Encourage large farm types as well as give incentives to subsistence farmer to invest in productivity. • Emergence of commercial dairy farms on a large scale. • Large aggregate production of milk. Develop rural and urban markets to sell milk and dairy products from adjacent milk pockets. • Joint ventures based on large potential and access to regional markets. • Government interest and willingness to contribute. • Build on consensus to develop and implement quality standards. • Consolidation and improvement in retail segment in large cities. 	<p>Threats</p> <ul style="list-style-type: none"> • Farmer cooperation around collection and central milking is expensive and difficult to manage. • Lack of breed management at the macro level and low potential of indigenous animals. • Unregulated imports of dairy products and additives. • Vested interests in perpetuating the dependence on imports of dairy commodities. manage.

Source: J. E. Austin Associates, Inc.

(supply) to best meet the needs of those markets. Only by accessing and understanding the specific needs of the market can the commercial sector utilize its resources in the most efficient way that creates the most value for both the producer and the customer. As a more in-depth understanding of the market is developed and the supply is upgraded accordingly, the value chain then must concentrate on upgrading its suppliers and supporting industries and working with the government to improve its business environment.

In contrast to the SWOT analysis, the Competitiveness Diamond is an analytical tool that poses very specific questions to the economic leadership about a specific industry. It can also be used as a framework for evaluating an overall regional or national economy. Figure 4.6 outlines many of the key questions to be posed when conducting a diamond analysis.

Once the competitiveness of a value chain has been understood, value chain analysis must then delve more deeply to highlight the underlying drivers of competitiveness: strategic productivity, operational productivity, supply chain management, human capital, and the business environment. Only at this level of assessment is it possible to uncover the investment and actions required to increase the performance of the chain in regional and international markets.

Assessing strategic productivity

The primary means of increasing value chain productivity is by choosing appropriate markets and products and by adding new product features and service components that enable companies to increase the value of their product and, hence, its price. This “strategic” or “market price-related” productivity can be as important as “operational” productivity in determining competitiveness. In practice, understanding the strategic position of a firm or value chain in key markets helps to orient and focus investment on the highest value activities. By (re)positioning products in new markets or to new customers or by adding additional value (real and perceived), companies increase their sales and profits per unit of capital and labor. Positioning is further discussed in tool 8.

When evaluating a value chain’s strategic productivity, the key questions to consider are:

- Which product segments are currently being offered by the companies in the chain? Do they represent the full range of segments that could be offered? Do they represent the highest-value segments in the industry?
- Which markets are currently being served by the companies in the chain? Do they represent the highest-value markets?

- Of the spectrum of potential customers in each key market for the chain, which customers is the chain best positioned to target?

A number of analytical tools can be employed in answering the questions above:

- Market segmentation and assessment
- Customer profiling
- Customer benefit analysis (product attribute gap analysis based on customer perceptions)
- Mapping the consumption chain (from sale to point of consumption)

Assessing operational productivity

A second way to improve value chain productivity is through operational productivity, improved technology, manufacturing, and service processes within specific segments of the value chain. Operational productivity focuses on the efficiency of each appropriate segment of activities on its own. By introducing new technology that improves processes and management systems, key players in the value chain can lower their costs and raise the productivity of their businesses, and the value chain overall.

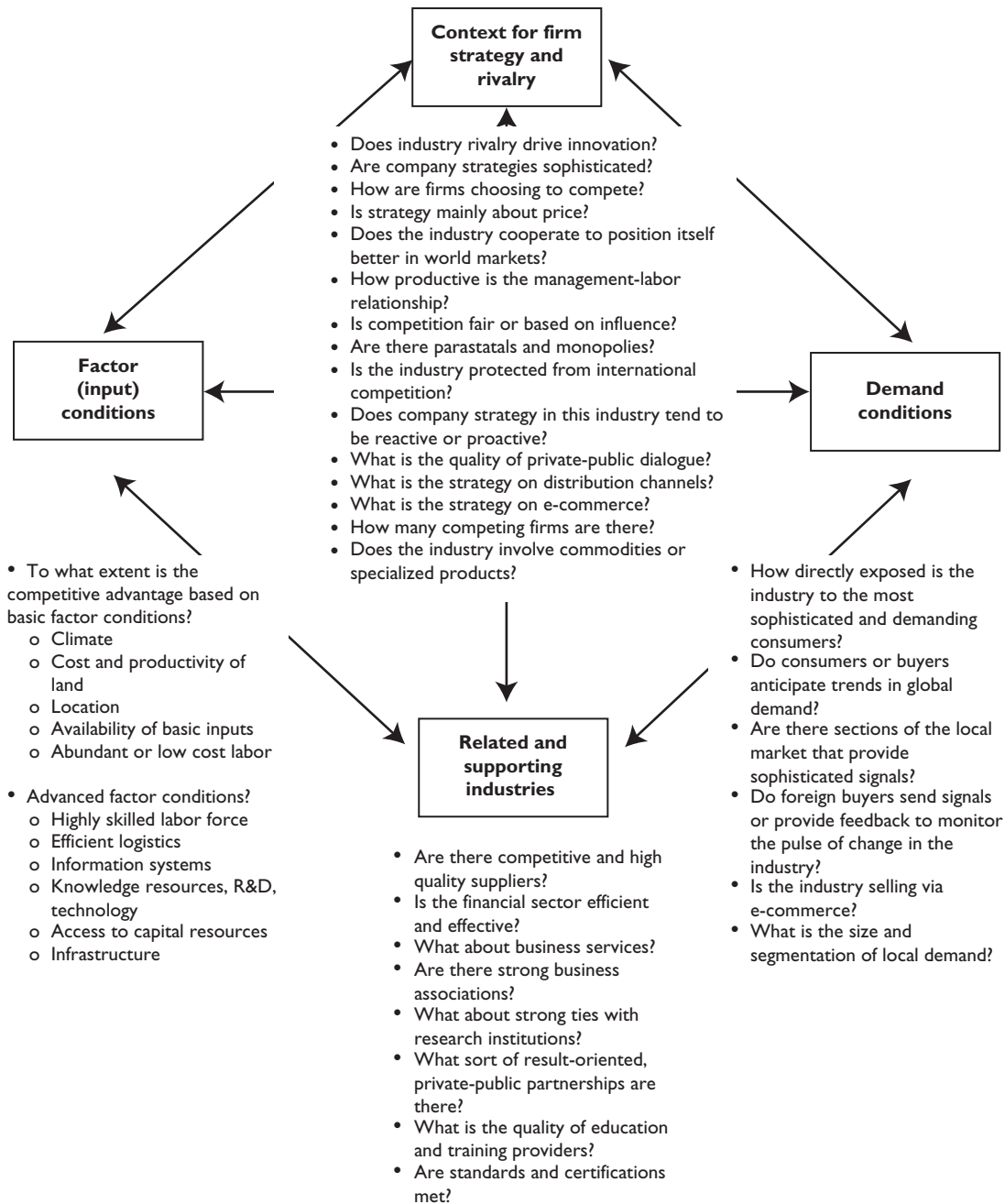
The following questions are useful in evaluating the operational productivity of a specific segment of the value chain and developing strategies to enhance it:

- How do our costs compare to the price for the product in different markets (that is, which markets are profitable to serve based on the current cost structure)? Are we excluded from competitively serving key markets because of our cost structure?
- How do the costs of the value chain compare to other competing value chains?
- What are the key trade-offs between cost and quality for the product?
- Who is in control of the cost drivers?
- What are the opportunities for lowering costs without compromising quality?

Analytical tools that can assist in determining the answers include:

- Per unit economic cost-driver analysis (fixed versus variable costs within each activity)
- Cost-trend analysis (historical and projected changes in cost drivers)
- Per unit activity-cost benchmarking

Figure 4.6 Competitiveness Diamond Analysis—Key Questions



Source: Michael Porter, adapted by J. E. Austin Associates, Inc.

Assessing the quality of supply chain management

Focusing on supply chain management in terms of costs of raw materials, transportation logistics, communications, and information technology—aspects of the chain that have generated great efficiencies in manufacturing, retailing, and

other industries—is a third way to fully understand the underlying drivers of competitiveness. Supply chain management is different from operational productivity. It focuses on the flow of goods and information along the chain of activities, the efficiencies of these flows, the transactions

that facilitate value added, and the economic relationships that underlie each set of transactions.

Questions to consider when evaluating the supply chain include:

- Is the relationship among buyers and suppliers in the value chain cooperative or adversarial?
- How effective is the flow of information along the value chain (market trends, changes in price, external cost pressures)? How aware are the producers of the downstream market dynamics of the industry (market trends, demand conditions, pricing)?
- How sensitive is the overall cost structure to the cost of raw materials?
- How do logistics services affect the cost of raw materials and intermediary products?
- What is the availability of supporting services (financial, logistics, administrative) across activities in the value chain?
- How long does it take for a product to go from initial production to end-market? How does this compare with competing value chains?

Analytical tools that can assist in determining the answers include:

- Supply chain analysis:
 - Distribution of players across chain activities
 - Farm-to-market mapping: number of transactions and time required
- Benchmarking other supply chains
- Mapping of support services across the supply chain
- Mapping of information flows along the chain
- Supplier assessments

Assessing human resources across the value chain

The next driver of value chain productivity is the quality of human resources available for the chain to tap.⁴ Thus, a fourth way to improve productivity is by investing in human resources. This may involve enhancing motivation, management, and training at the firm level, both by upgrading the overall education system and through utilizing specialized institutes.

Improving the overall quality of the workforce is often seen as the mandate of government and the educational institutions, outside of the direct control of industry. Similarly, specific technical and management skills are viewed as the concern of specific firms or industries. Neither perception is

accurate. Upgrading the technical and management skills of an entire value chain requires close cooperation of the firms along the chain and the supporting government and academic institutions.

The following questions can be considered when assessing the level of human resources across the spectrum of activities in a value chain:

- What incentives are present to encourage firms to invest in the technical and management skills of their employees?
- Do firms have difficulty retaining trained talent?
- What supporting educational services are available to firms locally to increase the skill levels of their staff? (industry certifications, IT training, technology application)
- How well do the academic institutions know the needs of industry? Is the curriculum aligned with the specific skill requirements of the industry?
- Are there industry standards for industry skill levels? Do the academic institutions teach to these standards?
- How do the skill levels of the value chain's workforce compare to competitors along key skills categories?

Analytical tools that can assist in determining the answers include:

- Industry workforce assessments to evaluate the demand- and supply-side conditions for labor in the industry and across the labor market in general.
- Skills segmentation, classification, and benchmarking analyses for the value chain against competitors.
- Bridge analyses⁵ to assess the strength of linkages between industry and academic institutions.

Assessing the business environment

The quality of the business environment ultimately serves a gate-keeping function, and often a negative one. Productivity increases are achieved at the firm and value chain levels by improving the quality of business strategy and operations—for example, by forming new partnerships with international firms in their value chains that provide access to markets, technology, finance, and know-how. Interventions designed to enhance productivity will differ by value chain and will require a different balance across the four components (strategic productivity, operational productivity, supply chain management, and human resources) discussed above. However, a factor common across all value chains and components is that the

business environment contributes importantly to the ability of firms to succeed in enhancing productivity. These “business environment” factors, also called the microeconomic foundations of growth, are perhaps especially important in the context of Africa,⁶ they include: the level of bureaucracy and red tape; the extent to which the rule of law is enforced and commercial courts are functional; the quality of infrastructure; the level of financial sector modernization and regulation; levels of trade access; and the ability of the country to attract foreign investment and to ensure the proper functioning of land markets (through reliable registries) and labor markets (through policies that encourage job creation, labor flexibility, and overall productivity).

Numerous methodologies and analytical tools exist to evaluate the business environment of a particular value chain.⁷ In most cases, the analytical tools are targeted at a specific area of the business environment. The following are a few general tools that can be used:

- Regulatory impact analysis
- Mapping of the time and cost of bureaucratic processes
- Per unit costing of rent-seeking activities across the value chain
- Total annual costing of weaknesses in infrastructure relevant to the industry

Means by which businesses can participate in improving the business environment are described in tools 10 and 11.

A STEP-BY-STEP SUMMARY OF TOOL 2: DESIGNING INFORMED STRATEGIES ACROSS THE VALUE CHAIN

- Conduct a value chain product unit financial analysis and SWOT analysis. First, understand the distribution and flow of resources and profits along the chain. Collect key data at each segment of the value chain, and graph the unit costs, unit revenue, and unit profit for each step. To complement the financial and operational data, conduct a SWOT analysis in a participatory manner with value chain leadership to qualitatively characterize the state of the value chain.
- Conduct a Competitiveness Diamond analysis. For the value chain, assess the strengths and weaknesses of each of the four pillars of the competitiveness diamond: 1) demand conditions; 2) factor inputs; 3) context for firm strategy and rivalry; and 4) related and supporting industries.
- Assess strategic productivity of the value chain. Use analytical tools such as market segmentation and assessment, customer profiling, customer benefit analysis, and

consumption chain mapping to understand the current strategic positioning of the value chain, as well as potential markets and product offerings.

- Assess operational productivity of the value chain. A variety of tools are available to analyze the operational productivity and performance of the value chain including per unit economic cost-driver analysis (fixed versus variable costs within each activity), cost-trend analysis, and per unit activity-cost benchmarking.
- Assess the quality of supply chain management. To gauge the efficiency in the flow of goods along the chain, the following tools can be useful: farm-to-market mapping (number of transactions and time) and distribution of players across the chain, supply chain benchmarking, mapping of supporting services, mapping of information flow along the chain, and supplier assessments.
- Assess the human resources across the value chain. To assess the quality of the value chain workforce, the following tools can be used: Demand- and supply-side analyses of the labor market for the value chain, skills segmentation and benchmarking analyses with competitor value chains (including labor productivity, number of skilled graduates), or the 10 bridges analysis⁸ of the linkages between industry and academia.
- Assess the business environment. Numerous tools are already well developed to assess the business environment of a value chain. Among the most tested are regulatory impact analyses, mapping of time and cost of bureaucratic processes at each stage of the value chain, per unit costing of rent-seeking activities along each segment of the value chain, and total annual cost of weaknesses in infrastructure.

NOTES

1. This value chain productivity framework was developed by J. E. Austin Associates, Inc., for use in developing and implementing industry strategic agendas with public and private sector leaders.

2. Productivity is the efficiency by which a firm uses its natural resources, labor, and financial resources. It is measured in terms of output per unit hour of labor, capital-output ratios, and total factor productivity. These drive returns to labor and capital, which in turn drive wage levels and overall prosperity.

3. Often referred to as the “Porter Diamond,” the diamond and many of its applications were developed by Michael Porter of the Harvard Business School.

4. Many tools and methodologies have already been developed to evaluate and address this area. A detailed consideration

of workforce issues is largely beyond the scope of this Guide. Perhaps they can be addressed more fully in a subsequent volume. For more detailed information on workforce development, readers are directed to the extensive body of literature available publicly on the World Bank Web site.

5. Derived from J. E. Austin Associates, Inc.'s "10 Bridges Approach," a methodology for building workforce competitiveness through university-industry collaborations.

6. Dr. Michael Porter, the thought leader of business competitiveness, weights his "Business Competitiveness Index"

in the influential World Economic Forum Global Competitiveness Report with 80 percent on the national business environment and 20 percent on "the quality of business strategy and operations."

7. Annual reports on the conditions of the business environment in specific countries, such as the World Bank Doing Business and the Global Competitiveness Report, provide useful examples as they use many of the survey and analytical tools at the economy level.

8. Analytical tool developed by J. E. Austin Associates, Inc.

CASE STUDY 3

Understanding the Value Chain and Integrating Information into Strategy— Nigerian Domestic Catfish

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INTRODUCTION

Despite government support for major investments in some 40 additional public fish farms and hatcheries, aquaculture expansion has been a slow process in Nigeria, because private sector fish farmers have faced major constraints, including lack of supporting feed and seed companies. Dixie and Ohen (2006) conducted a market study to better understand these private sector constraints and opportunities.

Nigeria is the fifth largest aquaculture producer in the world. In Nigeria, domestic fish is a preferred protein that rivals red meat in consumer demand. Domestic demand for fresh catfish has grown as Nigerian incomes increase. Nigeria has become one of the largest importers of fish in the developing world, bringing in some 600,000 metric tons (mt) annually. There is a growing awareness of aquaculture in Nigeria, with more than 100 private commercial fish farms currently in production.

At the New Partnership for Africa's Development (NEPAD) 2005 "Fish for All Summit," Nigeria's president Olusegun Obasanjo stated that, "if Africa's per capita consumption of fish is just to be kept at its present level, though grossly low and unacceptable, then fish production must be increased by over 250 percent by 2015. This unhealthy situation calls for urgent action and indeed poses a great challenge to all of us." President Obasanjo further remarked in his closing address that although fishing

brings Africa export earnings of US\$2.7 billion annually, "these benefits are at risk as the exploitation of African natural fish stocks is reaching its limits, and aquaculture production has not realized its full potential" (EurekNews and BBC News).

THE TOOL: MARKET ASSESSMENTS

Value chain participants must consult the market when determining how to increase profits, reach new markets, innovate, and increase productivity. There are seven widely accepted means of developing market analysis that contribute to identifying opportunities to capture more value. They are detailed in the Market Assessment Methods box below (Engelmann and Swisscontact 2005).

In Nigeria, a market survey was used to gather quantitative and qualitative information about buyers, sellers, volumes, prices, market trends, market share, and market segments, along with qualitative information on competitors. The rationale behind this approach was that surveys can accurately represent the opportunities and demand characteristics of the markets studied. Value chain participants can use surveys to identify broad problems in a market, such as lack of knowledge about a particular service, limited understanding of its benefits, or failure to assign appropriate value to outside assistance. This type of information is useful for establishing new products or services within the value chain.

Market Assessment Methods

The following methods are derived from Engelmann and Swisscontact (2005).

- Secondary research refers to the use of data that have already been collected, analyzed, and made available for other purposes. Value chain participants may find such research useful for identifying sectors experiencing growth, as well as for understanding government regulations and policy.
- Group discussions permit value chain participants to explore issues in general terms, then seek more specific information by using focus group discussions.
- In-depth interviews provide qualitative and quantitative information on the value chain and are particularly useful for different participants of value chains to understand their complementary relationships.
- Market observation can be used by value chain participants to obtain qualitative and quantitative data from local markets on transactions, interactions, processes, and embedded services. Observations are also a simple tool to cross-check information obtained from other sources.
- Interactive workshops or meetings can be used to validate and deepen previously gathered information. They can generate ideas for addressing constraints or opportunities in the market. In addition, these workshops may lead to a common approach in solving market problems among all of the value chain participants.
- Product concept testing aims to gauge the demand for a service or product that the value chain does not yet produce and about which the value chain customers have no knowledge.
- Market and consumer surveys are useful (as evidenced by the Nigerian case study) to obtain an accurate picture of serviceable aspects of the market for the product or service.

Figure 4.7 Map of Nigeria



Source: World Bank.

BACKGROUND

Africa produced 7.31 million tons of fish and seafood in 2002 (Dixie and Ohen 2006). On the continent, aquaculture development has been most notable in Egypt, where a combination of tradition, market demand, available and well-managed water resources, marketable species, and private sector initiative resulted in dramatic growth during the 1990s. The top three African producer nations were Egypt (accounting for 85.6 percent of the total), Nigeria (6.5 percent), and

Madagascar (1.8 percent). Egypt's aquaculture growth and development has been the most significant because it has increased production levels from 85,000 tons in 1997 to 376,000 tons in 2002, a 35 percent average annual growth rate.

By 2006, farmed catfish accounted for approximately 50 percent of Nigeria's domestic annual fish production. The catfish industry provides approximately US\$75 million in revenues at the farm gate and accounts for nearly US\$180 million in consumer spending. The sector contributes to the employment of nearly 25,000 people, with the majority (over two-thirds) employed as restaurant workers. Aquaculture and Nigerian farm-raised catfish have also been identified as a growing source of income for Nigerian farmers.

To ensure success, any new investments or expansion of production must be driven by market demand and consumer preferences. This case study features the information gathered from a domestic market assessment for the farmed and fresh catfish value chain conducted by Dixie and Ohen (2006) to demonstrate the value of market information in determining future investments and/or interventions in a value chain.

THE NIGERIAN CATFISH VALUE CHAIN

The domestic market demand for fresh and smoked Nigerian catfish is outstripping the supply. Tastes and preferences for catfish have been increasing due in large part to the availability,

cost, consumer preference for white meat, perceived health benefits over substitute products, and some popular catfish dishes served by restaurants (Dixie and Ohen 2006).

Production

According to Dixie and Ohen (2006), the value of Nigerian catfish produced and sold by aquaculture farmers is about US\$75 million, which assumes a production level of about 30,000 tons of catfish per year. At the retail level, this tonnage rises in value to about US\$120 million. Restaurant operators capture an additional US\$60 million dollars on catfish, for a total of US\$180 million in sectorwide consumer spending. Estimates indicate that approximately 70 percent of fresh fish in Nigeria is sold in restaurants, especially in *bukas*.¹ The major cost of production for farmers is European catfish feed, which amounts to approximately US\$39 million. Nigeria currently relies on imports because a sizeable fish-feed industry has yet to develop. The majority of domestic feed supplies are farm made, with only a few animal feed millers providing domestic commercial feed pellets (Moehl, Halwart, and Brummet 2005).

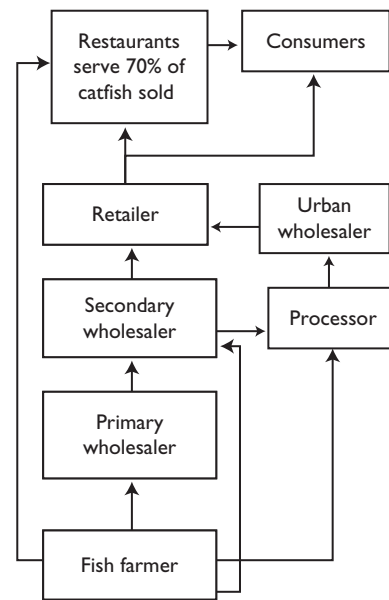
Supply

Farmed catfish are almost universally sold at the farm to primary wholesalers, retailers, or buka owners. As indicated in figure 4.8, primary wholesalers have been chiefly responsible for developing the trade from the major fish farms in Nigeria. Traditionally, these wholesalers transport live catfish to secondary wholesalers who sell to other retailers, restaurants, or consumers. It is worth noting that, in the major production areas, retailers and restaurants are increasingly buying directly at the farm, thus cutting out middlemen and vertically integrating. A new trend in the industry is that the majority of fresh catfish, especially larger fish, are now sold directly to bukas, restaurants, and hotels.

Demand

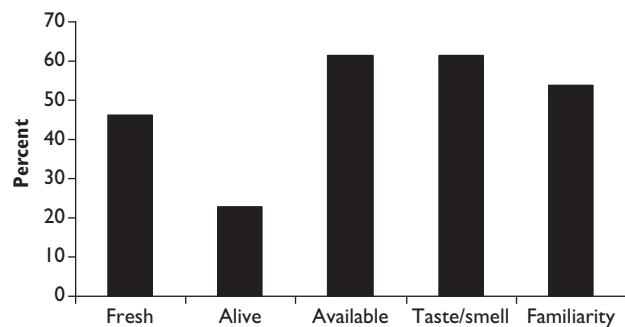
Dixie and Ohen (2006) cite Nigerian consumers' requirements and demands with respect to catfish and catfish products that are fairly common across regions and markets. As indicated in figure 4.9, key consumer motivations for consuming catfish were 1) availability, 2) taste/smell, and 3) familiarity. Over 90 percent of consumers said that they were increasing their purchases of catfish, and 15 percent identified bird flu as affecting their purchases. Comments were made about the health benefits of white meat (for example, catfish), and a significant number made reference to a

Figure 4.8 Nigerian Domestic Catfish Farming Value Chain



Source: J. E. Austin Associates, Inc.

Figure 4.9 Consumers' Reasons for Purchasing Live Catfish



Source: Dixie and Ohen (2006).

perception that after a certain age (normally about 35), red meat should be given up entirely. Nearly 80 percent said that they would use catfish to prepare pepper soup—by far, the most popular use—and about 40 percent said it would go into other soups or stew dishes.

Opportunity

According to traders and retailers, product losses (fish death, quality loss) and finance are the most common challenges

cited by fresh catfish traders and retailers. Fresh and living catfish command a retail price twice that of frozen fish. Traders and retailers do not use proper storage facilities, do not change the water sufficiently, and often leave the fish in the sun for long periods—all leading to product loss and lower quality, which translate to lower revenues. Traders indicate that limited finance constrains the ability to develop and invest in business operations or expansion. Secondary issues are problems with debt recovery, market location, electricity (mainly for refrigeration), skin damage to the fish (which reduces the sale price), and transport costs.

Nigerian catfish farmers report that the marketing of fresh catfish is becoming more difficult because of increasing competition. Some farmers in the southeast also recognize that the difficulties in selling fish result from a general lack of organization (for example, farms all try to sell fish on the same day). To control marketing problems, farmers say that they would like to have direct contact with traders further down the marketing chain. Farmers have indicated that information sharing within the value chain is sparse and that there is frustration that primary wholesalers shield their sources of supply from secondary wholesalers and retailers. In addition, in some locations, retailers feel that they have to pay higher prices than necessary because they are unable to buy direct, or at least need better information about the selling prices at the farm.

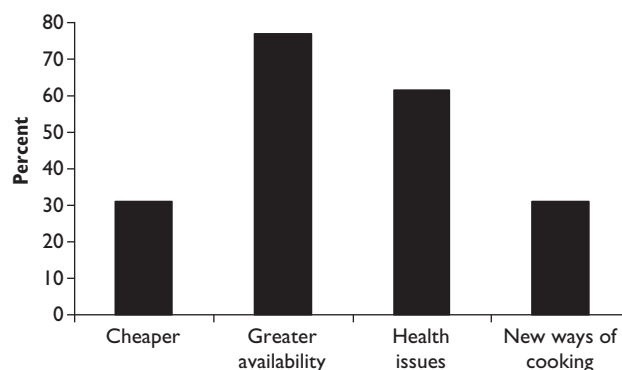
The Nigerian catfish market projections provided by the surveyors imply that the undersupply of farmed catfish may amount to some 5,000 mt per year, which could be rapidly addressed by expanding production. The urban markets, where farmed fish is primarily sold, will grow by about 3 percent annually purely through population growth.

Once these sources of demand have been met, additional supplies will have to be absorbed by stimulating sales through lower retail prices, the addition of value-added operations, or exports. Fish farmers and their value chain colleagues will have to take a much more proactive approach to learning about the market and initiating sales and marketing activities. This is likely to involve conducting their own market research and establishing closer contacts with retailers, traders, restaurants, and processors. These will be new activities for producers.

Interventions in the Nigerian fresh catfish value chain

The survey results point to many possible value chain initiatives. Unmet and clearly increasing market demand should be addressed by increasing supply from producers

Figure 4.10 Consumers' Views of What Factors Would Increase Their Consumption of Catfish



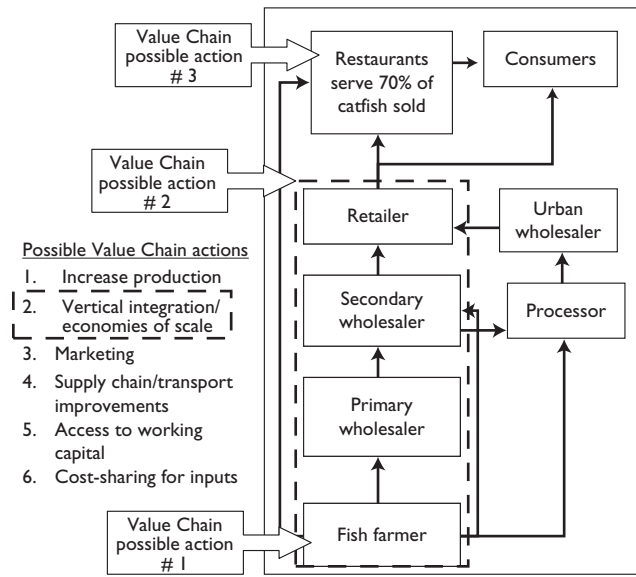
Source: Dixie and Ohen (2006).

(“Value Chain Possible Action #1” in figure 4.11), taking advantage of the opportunities to vertically integrate operations (“Value Chain Possible Action #2”), and developing more sophisticated marketing and distribution systems in order to capture more value (“Value Chain Possible Action #3”). There is also ample opportunity for producers to band together and gain a competitive advantage through economies of scale. Costly inputs can be purchased at significant savings with effective cost-share agreements and in larger quantities. Also, associations of producers or the firms linked to them can combine to act in groups to attain the scale and market power necessary to create permanent marketing links and secure contracts to provide restaurants with guaranteed supply and quality.

These new distribution systems will have an opportunity to increase the marketing of catfish and improve the safe transport of products. The market assessment conducted by Dixie and Ohen (2006) confirms that consumers prefer catfish based on its purported health qualities, its cost, and its availability, as well as enthusiasm for its taste and preparation in popular dishes and as a complementary product to beer. There is an opportunity to capitalize on these preferences in marketing initiatives while simultaneously expanding the market supply.

Currently, losses during transportation are estimated to be between 10 to 15 percent of value, with practices varying widely across the sector. With better organization, appropriate postharvest methods suited to Nigerian conditions can be propagated to the retail, trading, and restaurant sectors. Producers or wholesalers should seek technical expertise and assistance to lower these loss rates and improve the quality of the catfish that they distribute.

Figure 4.11 Nigerian Catfish Farming Value Chain—Possible Actions



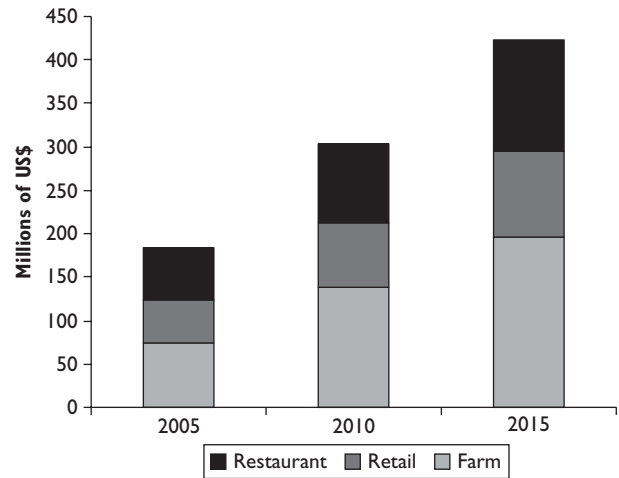
Source: J. E. Austin Associates, Inc. 2007 adapted from Dixie and Ohen 2006.

Financing is still not widely available for restaurants and bukas to increase their working capital and expand their businesses. With growing demand and falling prices, there is an opportunity to provide financing to promising end-market businesses that may pull the value chain toward higher growth vectors.

CONCLUSION

The market assessment survey has furnished important information that allows the value chain actors to identify

Figure 4.12 Projected Development of the Value Chain for Fresh Catfish, 2005–15



Source: Dixie and Ohen (2006).

growth opportunities and priority interventions. The Nigerian domestic catfish market is clearly rich with opportunity for increasing sales (see figure 4.12); there are numerous constraints and other issues that can be addressed, and there is room for value chain collaboration centered on production, investment in transport and infrastructure, marketing, commercialization, and vertical integration.

NOTE

1. The word “buka” refers to a “canteen or eating house” in the Hausa language.

