

United States International Trade Commission

**Sub-Saharan Africa:
Effects of
Infrastructure
Conditions on Export
Competitiveness,
Third Annual Report**

Investigation No. 332-477

USITC Publication 4071

April 2009



U.S. International Trade Commission

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United States International Trade Commission
Washington, DC 20436

U.S. International Trade Commission

Washington, DC 20436
www.usitc.gov

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This report was prepared principally by

Project Leaders

Erland Herfindahl
erland.herfindahl@usitc.gov

Alan Treat
alan.treat@usitc.gov

Principal Authors

Chapter 1:	Cathy Jabara	cathy.jabara@usitc.gov
Chapter 2:	Michael Ferrantino	mferrantino@usitc.gov
Chapter 3:	Isaac Wohl	isaac.wohl@usitc.gov
Chapter 4:	Joann Peterson	joann.peterson@usitc.gov
Chapter 5:	Dennis Luther	dennis.luther@usitc.gov
Chapter 6:		
Coffee:	Mark Simone	mark.simone@usitc.gov
Shea butter:	Dan Cook	justin.cook@usitc.gov
Tropical fruit:	Brendan Lynch	brendan.lynch@usitc.gov
Natural rubber:	Philip Stone	philip.stone@usitc.gov
Textiles and apparel:	Dawn Heuschel	dawn.heuschel@usitc.gov
Leather:	John Fry	john.fry@usitc.gov
Tourism:	Laura Bloodgood	laura.bloodgood@usitc.gov

Primary Reviewers

Nannette Christ and Karl Tsuji

Special Assistance

Diane Bennett, Brenda Carroll, Andrew Gately, Joe Kowalski, David Lundy,
Cynthia Payne, Laura Polly, and Danielle Vu

Under the direction of

Richard W. Brown, Chief, Services Division
richard.brown@usitc.gov

Sub-Saharan Africa



Abstract

This report describes conditions in the land transport, maritime transport, and electricity infrastructure sectors, and examines their effects on export competitiveness in sub-Saharan Africa (SSA), particularly on the following industries: coffee, shea butter, and certain tropical fruit (pineapples and bananas) in the agricultural sector; natural rubber and related downstream products, textiles and apparel, and leather in the manufacturing sector; and tourism services in the services sector.

Infrastructure conditions in SSA have a significant effect on the ability of firms to produce and export goods and services competitively. Relatively poor infrastructure conditions place many SSA producers and exporters of goods and services at a competitive disadvantage in regional and global export markets, increasing costs and compromising product quality, rendering both merchandise and services exports less competitive vis-à-vis exporters that may not be similarly disadvantaged. Roads in SSA are often unpaved and poorly maintained, rail networks are limited, and ports lack sufficient capacity. As a result, SSA producers often incur increased transportation costs and shipment delays. Electricity infrastructure is largely inadequate, unreliable, and poorly developed, particularly in rural areas, requiring producers to rely on more expensive on-site power generators, which further increase production costs.

However, SSA governments and the private sector are implementing various strategies, including government regulatory reform, increased investment, and new applications of technology to improve infrastructure conditions within SSA, often in conjunction with neighboring countries, SSA regional organizations, multilateral institutions, and non-SSA countries.

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Executive Summary

The state of a country's infrastructure is a major determinant of economic growth, social welfare, and trade. Land transport, maritime transport, and electricity infrastructure are critical to the ability of sub-Saharan African (SSA) countries to produce and export the vast majority of goods destined for regional and global export markets. Poor infrastructure conditions increase costs and compromise product quality and are a significant competitive disadvantage to the SSA industries examined in this report.¹ However, SSA governments and the private sector are implementing various strategies, including government regulatory reforms, increased investment, and new applications of technology, to improve infrastructure conditions. These efforts have often been undertaken in conjunction with neighboring countries, SSA regional organizations, multilateral institutions, and development agencies. The main findings of this report are highlighted in table ES.1 and the main conclusions regarding strategies to improve infrastructure are in table ES.2 at the end of this summary.

Effects of SSA's Infrastructure Conditions

Poor infrastructure conditions increase production costs, economic distance (the time and cost of transporting goods), and business uncertainty, and undermine SSA's export competitiveness. Most roads in SSA are poorly maintained and often unpaved, and truck fleets generally consist of aging, fuel-inefficient vehicles that are often overloaded and contribute to further road degradation. Poor roads and truck breakdowns result in the slow movement of goods, considerable damage to goods in transit (particularly to perishable goods), and high shipping costs relative to other areas of the world. Rail networks in SSA are limited and generally even less reliable than trucks, increasing the dependence on roads to transport goods. "Soft" infrastructure constraints, such as excessive check points, burdensome administrative procedures, and inefficient processing at border crossings, often cause longer delays than poor road conditions. These delays increase economic distance and often reduce product quality, particularly for perishable goods, leading to higher rejection rates, higher production costs, and lower income for producers. For instance, Rwandan coffee producers require an average of 42 days to export, excluding maritime transport, owing to long distances to port, poor road conditions, and customs delays. In contrast, Colombian producers require only 14 days to export, excluding maritime transport. These delays suggest that Rwandan coffee exporters face a 36 percent tariff equivalent compared to Colombian coffee exporters, significantly reducing income potential for Rwanda's 500,000 coffee farmers.

Ports in SSA are inefficient by global standards and lack sufficient capacity, resulting in increased port charges, elevated maritime freight costs, and delays, all of which adversely affect SSA's export competitiveness. Many of the major ports in SSA are congested because of insufficient capacity, and procedural delays and inefficiencies often compound the problem. As a result, goods moving in or out of ports suffer lengthy delays. Furthermore, problems in one SSA port may affect port schedules in other SSA ports on the same shipping route, compounding delays and creating uncertainty. For

¹ These industries are coffee, shea butter, and certain tropical fruit (pineapples and bananas) in the agricultural sector; natural rubber and related downstream products, textiles and apparel, and leather in the manufacturing sector; and tourism services in the services sector.

example, anticipating ship arrival dates, Ghanaian pineapple farmers sometimes harvest their crop for export but only later discover that the ship is late; such delays can lead to decreased shelf life, compromised product quality, and higher rejection rates.

Electricity infrastructure in SSA is the least developed, least accessible, least reliable, most costly to operate and, on average, highest priced of any region in the world. As a result, energy costs account for a higher proportion of production costs in many SSA industries relative to global competitors. Even in South Africa, which has the most competitively priced and extensive electricity network in SSA, the unreliability of electricity increases the uncertainty of maintaining production schedules. This uncertainty also compels many firms to rely on expensive on-site diesel generators, increasing overall production costs. In certain cases, such as a tire factory in Nigeria and a textile firm in South Africa, major producers have closed facilities due to expensive and unreliable electricity.

Strategies to Improve Infrastructure

The critical role of infrastructure in export competitiveness, economic growth, and social welfare is widely recognized by governments, development agencies, multilateral organizations, and the private sector. These institutions have implemented a broad array of responses to ameliorate infrastructure conditions in SSA, including increased infrastructure investment, government reform and regional regulatory harmonization, and new applications of technology. A review of these efforts suggests strategies for overcoming infrastructure constraints. Table ES.2 provides examples of such strategies, which are interrelated and often overlap; e.g., regulatory reform can lead to private-sector participation, increased investment, and new uses of technology.

Because challenges associated with improving land transport, maritime transport, and electricity infrastructure are tremendous, in many cases no single SSA government or donor organization is capable of addressing these issues alone. Many SSA governments have developed regional partnerships to address infrastructure constraints and improve infrastructure conditions.

Infrastructure Investment

Because capital requirements for upgrading infrastructure are significant, major infrastructure projects increasingly rely on a combination of public- and private-sector financing and regional cooperation initiatives to pool capital and spread investment costs. Many of the large-scale power projects under consideration in SSA call for the participation of public and private entities from multiple countries. In a few instances, one organization, be it public or private, incurs the majority of the financial burden and risk of building new infrastructure, as is the case of Dubai Ports World's construction of a new container terminal at the port of Djibouti in East Africa. Nontraditional lenders, such as China and India, are also playing an increasingly important role in financing infrastructure in SSA, often linking such financing to natural resource concessions.

Government Reform and Regional Regulatory Harmonization

Governments across the region have separated regulatory and operational duties, while significantly expanding the role of the private sector in the operation of infrastructure sectors, such as ports and electricity. Many SSA countries have reformed regulations to promote viable and efficient infrastructure sectors. Examples include setting electricity rates at levels sufficient to ensure cost recovery for power generators and extending the hours for which customs facilities are open. Individual SSA countries are also engaged in important regional reform efforts, such as coordinating policies and technical standards to improve regional transportation and power networks.

Application of Technology to Mitigate Negative Effects

In recent years, governments and firms in SSA have introduced technologies to improve infrastructure conditions directly and to mitigate the negative effects of poor infrastructure conditions on export competitiveness. For example, by implementing computerized customs systems, governments have been able to significantly decrease delays at ports and land border crossings while reducing the opportunities for human error and corruption. SSA producers have adopted technologies that either compensate for poor infrastructure conditions or serve as a partial substitute for infrastructure. For instance, coffee producers in landlocked Rwanda have expanded the use of washing facilities to increase product quality, and thus price premiums, in an effort to compensate for high transportation costs compared with global competitors. Individuals and businesses are also taking advantage of the region's increasingly expansive mobile telecommunications system to acquire timely market information and conduct business transactions, thereby bypassing difficult travel conditions on poor quality roads.

TABLE ES.1 Sub-Saharan Africa: Summary of effects of infrastructure conditions for select SSA industries and countries

Industry	SSA exporters highlighted in this report	Key export markets (by value)	Effects of conditions in the following infrastructure sectors on export competitiveness:		
			Land transport	Maritime transport	Electricity
Agriculture					
Coffee	Ethiopia Rwanda	EU Algeria United States Japan	Poor road quality or lack of adequate road networks increases transportation times, which can adversely affect coffee bean quality. Insufficient trucking capacity results in trucking shortages and increased fees to export coffee.	Port congestion contributes to increased transportation costs and delays, ultimately increasing overall production costs and compromising coffee quality.	Expensive and unreliable electricity increases production costs and disrupts coffee washing, a value-adding process that relies on water pumps to deliver clean water.
Shea butter	Burkina Faso Côte d'Ivoire Ghana Togo	EU United States	Poorly maintained roads between local villages and central markets disrupt delivery schedules, increase transportation costs, and decrease financial returns to local shea producers. Road congestion, vehicle breakdowns, excessive checkpoints, and inefficient border crossings all increase shea export transport time.	Port congestion contributes to increased transportation costs and delays.	High electricity costs reduce incentives for investment in machinery to improve the efficiency of shea butter production.
Tropical fruit (pineapples and bananas)	Côte d'Ivoire Ghana	EU	Poor road conditions increase transport times and decrease shelf life. Poor feeder roads damage fruit during transport, contributing to rejection rates of 15–20 percent of fruit delivered by out-growers to nucleus farms. Congested and poorly maintained roads and numerous checkpoints increase the time and cost of transporting product from packing to port, even over short distances.	Tropical fruit exports from West Africa are at a disadvantage in export markets compared to other global competitors because of inefficient or infrequent shipping routes. Poor handling at the port can damage the fruit and lead to higher rejection rates, as compared to those experienced by Latin American exporters.	The development of cold storage facilities, which reduce spoilage and extend shelf life, is hampered by prohibitively high electricity costs and large amounts of capital required. Exports of pineapples from independent out-growers have declined substantially as a result of difficulties accessing cold storage facilities needed to handle new varieties of pineapple. Energy costs to some producers could decline by 60 percent or more if connected to electricity grids instead of relying on power generators.
Manufacturing					
Natural rubber	Côte d'Ivoire Liberia Cameroon Nigeria	EU United States	The lack of road infrastructure connecting collection points to processing plants constrains industry expansion.	Insufficient competition among freight carriers contributes to high transportation costs and terminal charges.	High electricity costs and frequent power outages hamper the ability to produce downstream rubber products. Poor infrastructure conditions in Nigeria render rubber tire production up to 40 percent more expensive than for other global producers.

TABLE ES.1 Sub-Saharan Africa: Summary of effects of infrastructure conditions for select SSA industries and countries—*Continued*

Industry	SSA exporters highlighted in this report	Key export markets (by value)	Effects of conditions in the following infrastructure sectors on export competitiveness:		
			Land transport	Maritime transport	Electricity
<i>Manufacturing—Continued</i>					
Textiles and apparel	South Africa Lesotho Kenya Swaziland	United States EU SSA	<p>Poor road conditions in Kenya increase transit times, thereby decreasing speed to market.</p> <p>Relatively better road conditions in southern Africa are a competitive advantage vis-à-vis other SSA apparel producers.</p>	<p>Port congestion and shipment delays hinder the ability to acquire imported production inputs, resulting in production losses and higher production costs.</p> <p>Uncertain delivery times for imported inputs result in working capital tied to higher levels of inventory to hedge against delayed shipments or other unforeseen circumstances.</p>	<p>Unexpected electricity outages disrupt production schedules, resulting in a loss of raw materials, decreased productivity, and increased production costs.</p> <p>High power costs in Kenya are a competitive disadvantage compared to producers in southern Africa that benefit from lower power costs.</p>
Leather	Ethiopia	Hong Kong EU China	<p>Poor road conditions and long distances adversely affect the quality of hides and skins, leading to higher rejection rates and lower prices paid by tanneries.</p> <p>A significant amount of working capital must be allocated to imported raw materials as a result of high transportation costs.</p>	<p>Port congestion contributes to increased transportation costs and delays.</p> <p>Tanneries may maintain high levels of inventory of imported inputs to hedge against the uncertainty of delivery schedules.</p>	<p>Frequent electricity outages disrupt the chemical processing of hides and skins into semiprocessed and finished leather.</p> <p>Back-up generators are used, but are more costly.</p>
<i>Services</i>					
Tourism	South Africa Kenya	SSA EU	<p>Superior infrastructure is a competitive advantage to South Africa's tourism industry.</p> <p>Congested roads in Kenya dampen potential tourism expansion, as traffic deters tourists from venturing beyond resort areas. Nevertheless, the desire to visit specific tourist attractions often outweighs the inconvenience of poor road conditions.</p>	<p>As there is a relatively small cruise industry in SSA, maritime infrastructure conditions have had a negligible effect on export competitiveness.</p>	<p>Unreliable electricity and frequent outages necessitate the use of back-up generators, resulting in higher costs.</p> <p>Principal tourist venues in rural South Africa tend to be fully self-reliant on generators, so the reliability of electricity infrastructure affects them considerably less.</p>
<p><i>Source:</i> Compiled by Commission staff.</p> <p><i>Note:</i> The effects of infrastructure conditions on production and trade in select SSA industries noted above are specific examples from the case studies presented in chapter 6 of this report. Because infrastructure conditions vary among countries within SSA, the relative effects of these conditions among all SSA producers in these industries also vary.</p>					

Table ES.2 Sub-Saharan Africa: Select strategies to improve infrastructure conditions

Strategy	Infrastructure sectors:		
	Land transport	Maritime transport	Electricity
Infrastructure Investment			
<i>Public and donor-financed investment</i>	In 2006 members of the Infrastructure Consortium for Africa (which coordinates international infrastructure development assistance) invested \$3.2 billion in transport projects in SSA, up from \$2.6 billion in 2005.	The Japanese Bank for International Cooperation is financing a second container terminal at the port of Mombasa, Kenya.	The African Development Bank is financing the Zambia–Tanzania–Kenya interconnection project, linking the electricity grids of Tanzania and Kenya to the Southern African Power Pool.
<i>Public-private partnerships</i>	Various greenfield projects including a number of those identified in table 3.2.	A.P.-Moller/Maersk Group (Denmark) and Bolloré Group (France) are constructing a deep-sea port and new container terminal in Douala, Cameroon.	The government of Uganda, Sithe Global Power (U.S.), and multilateral development agencies are jointly financing the 250 megawatts Bujagali hydroelectric power project.
Government reform and regional regulatory harmonization			
<i>Separation of operational and regulatory functions</i>	Nigeria concessioned a private company to develop and operate a toll road corridor in Lagos, while maintaining regulatory oversight of the road network.	Mozambique granted a 15-year concession to a private-sector consortium to oversee the management of the port of Maputo, while maintaining regulatory authority and ownership of port assets.	About one-half of SSA governments have established a regulator for electricity, and about two-thirds of all SSA countries converted their ministerial electric utilities into separate companies, which often remain government owned.
<i>Regional regulatory harmonization</i>	The Common Market for Eastern and Southern Africa has implemented a common carriers license and a Yellow Card program which guarantees third-party insurance across borders for trucks.	Bilateral proposals for cross-border corridor management committees are facilitated by the Economic Community of West African States.	The Southern African Power Pool allows member countries to coordinate the planning and operation of their electricity systems, facilitating electricity trade, and thereby reducing capital costs associated with maintaining electric reserves.
New Applications of Technology			
<i>Public-sector use of technology</i>	Swaziland has streamlined its customs procedures by using container scanners, risk management software, and satellite-based electronic tracking systems to provide pre-border clearance at some inland ports and export-producing factories.	Kenya implemented an Electronic Data Interchange system that allows shipping lines to submit cargo data electronically, which has reduced the customs clearance time at the port of Mombasa from six days to two days.	In Ghana, the World Bank, the government of Ghana, the Volta River Authority, and the Electric Company of Ghana are making grants to developers of renewable energy technologies to electrify rural areas.
<i>Private-sector use of technology</i>	A U.S. Agency for International Development–funded agribusiness project assisted Rwandan coffee farmers in obtaining custom cargo bikes to transport coffee to washing stations, thereby reducing transit times by two-thirds.	Terminal operator Hutchison-Whampoa (Hong Kong) is investing in new cranes and computer systems to increase cargo throughput at the port of Dar es Salaam, Tanzania.	Various SSA producers use diesel-powered power generators to compensate for inadequate or unreliable electricity supply, however often at relatively high cost.
Source: Compiled by Commission staff.			
Note: The strategies noted above are provided as illustrative examples, and are therefore not comprehensive. Strategies—and their effectiveness—to improve infrastructure conditions in SSA can vary widely among SSA countries.			

CHAPTER 1

Introduction and Overview

Well-maintained infrastructure supports economic activity and trade by facilitating the movement of people, goods, and services and serves as a key input in the production process. Land transport, maritime transport, and electricity infrastructure are critical to the ability of SSA countries to produce and export the vast majority of goods destined to regional and global export markets. This report examines the effects of infrastructure conditions on the export competitiveness of select industries within sub-Saharan Africa (SSA).¹ Specifically, this report describes conditions in the land transport, maritime transport, and electricity sectors, describes efforts to improve conditions in these sectors, and examines the effects of these conditions on the export competitiveness of the following industries in SSA: coffee, shea butter, and certain tropical fruit (pineapples and bananas) in the agricultural sector; natural rubber and related downstream products, textiles and apparel, and leather in the manufacturing sector; and tourism services in the services sector.²

In her letter, the United States Trade Representative asked the U.S. International Trade Commission (Commission or USITC) to examine the effects of infrastructure conditions on the export competitiveness of select SSA industries, particularly but not limited to industries considered in the previous two annual reports in this series.³ In response, the Commission selected six industries considered in the previous reports and one not previously considered. The Commission selected the seven industries largely on the basis of prior research that indicated that infrastructure conditions had a considerable effect on trade patterns for the products that these respective SSA industries produce. The Commission also considered other factors, such as geographic and sectoral diversity, the importance of each industry as a source of employment and foreign exchange, and government priority for industry development.

¹ Throughout this report, “SSA” is used to refer to both “sub-Saharan Africa” as a noun and “sub-Saharan African” as an adjective. Sub-Saharan Africa consists of the following 48 countries: Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Democratic Republic of the Congo, Côte d’Ivoire, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gabon, The Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Republic of the Congo, Rwanda, São Tomé and Príncipe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, Sudan, Swaziland, Tanzania, Togo, Uganda, Zambia, and Zimbabwe. (See map on inside cover of report).

² On July 27, 2006, the Office of the United States Trade Representative (USTR) requested that the U.S. International Trade Commission (Commission) prepare three annual reports under section 332(g) of the Tariff Act of 1930 (19 U.S.C. 1332(g)) addressing factors affecting trade patterns of selected industries in sub-Saharan Africa. On June 30, 2008, the USTR requested that the Commission focus its third and final report in this series on the effect of infrastructure conditions in land transport, maritime transport, and electricity on the export competitiveness of select SSA industries, particularly but not limited to industries considered in the first two annual reports in this series. See app. A for request letter and app. B for Federal Register notice.

³ See USITC, *Sub-Saharan Africa*, 2007; and USITC, *Sub-Saharan Africa*, 2008.

Approach

For the purposes of this report, export competitiveness is defined as the ability of producers to sell goods and services in foreign markets at price, quality, and timeliness comparable to competing foreign producers. The approach employed by the Commission to examine the effects of infrastructure conditions on export competitiveness in SSA is based on analyses of direct and indirect costs—for example, direct production costs, such as electricity and transportation costs; and indirect costs, such as those associated with electricity reliability and transit times. The Commission employed industry case studies to examine the effects of infrastructure conditions along the various stages of the supply and value chains for most of the SSA industries noted above. For example, the case studies describe how such conditions affect the direct and indirect costs of acquiring inputs, production and product quality, and exporting goods and services. The case studies highlight the experiences of producers in specific countries, and therefore should not be considered as representative of the experiences of producers in all SSA countries. The Commission’s analysis of the effects of infrastructure conditions on the export competitiveness of select SSA industries relies broadly on qualitative information obtained through fieldwork, as there is relatively little internationally comparable quantitative data. To the extent possible, the Commission sought and obtained quantitative data to augment its assessment of the effects of infrastructure conditions on the export competitiveness of producers within SSA, and also compared SSA as a region with other global competitors. Because factors other than infrastructure conditions, such as government regulation, trade policy, investment and technology, and natural endowments may affect export competitiveness, this report does not conclude that producers of one country are more export competitive than those of another based on the effects of infrastructure conditions alone. In addition, this report does not assess the relative importance of infrastructure conditions vis-à-vis these other factors. Comparisons of export competitiveness based on the effects of infrastructure conditions should thus take into account other factors that also affect competitiveness.

Information for this report was collected from a variety of industry and government sources, including domestic and foreign industry representatives; international organizations, including the World Trade Organization (WTO), the World Bank, and the United Nations Industrial Development Organization (UNIDO); U.S. and foreign government sources, including U.S. embassies and foreign ministries in SSA countries; written submissions by interested parties; and hearing testimony. In addition, Commission staff traveled to SSA and conducted over 100 interviews with government officials from ministries of trade and industry, ministries of infrastructure and public works, and port authorities and with industry representatives, including growers, producers, consultants, industry associations, logistics firms, and utility companies in East Africa (Ethiopia, Kenya, and Rwanda), southern Africa (South Africa and Swaziland), West Africa (Burkina Faso, Côte d’Ivoire, and Ghana), and the United States. Merchandise trade data throughout this report, unless otherwise indicated, were obtained from Global Trade Information Services, Inc. (GTIS) Global Trade Atlas database.⁴ Industry sectors highlighted in case studies in chapter 6 of this report were

⁴ Global Trade Atlas was the primary source of trade data for this report. Most data were collected as of October 1, 2008; however, Global Trade Information Services, Inc. (GTIS) periodically updates its database and certain values were updated at later dates. All data are reported as nominal values. Internal EU trade data were excluded. Throughout this report, references to the EU refer to the EU-27.

defined based on 2-, 4-, and 6-digit Harmonized System (HS) classifications (appendix table G.1).⁵

Organization of Report

Compared with previous Commission reports in this series in which each industry discussion comprised essentially a stand-alone analysis,⁶ this report is more integrated in nature. The report begins with an overview of infrastructure in SSA and its general effects on export competitiveness. The remainder of chapter 1 describes the contribution of infrastructure to economic growth and welfare and also notes the importance to production and trade of infrastructure sectors not considered in this report. Chapter 2 discusses the ways in which infrastructure conditions affect export competitiveness in SSA in terms of production costs, economic distance, and business uncertainty and draws on examples from chapters 3–6 and from fieldwork interviews. Chapters 3–5 examine conditions in SSA land transport, maritime transport, and electricity infrastructure, their general effects on export competitiveness, and efforts to improve these infrastructure conditions. Finally, chapter 6 provides specific analyses of the effects of these infrastructure conditions on the export competitiveness of select SSA industries.

Infrastructure, Economic Growth, and Welfare

Infrastructure includes services such as water and sewage treatment, energy, transport, information and communication technology (ICT), logistics,⁷ and financial services. Many of these sectors are particularly important to the facilitation of trade and investment and maintenance of public health (box 1.1).⁸ Infrastructure services are generally less available in SSA than in other regions of the world (table 1.1). In particular, SSA lags behind many other regions in electricity consumption, paved roads, telecommunications services, air transport, and access to clean water. Financial services infrastructure is also less developed—the relatively high interest rate spread (the difference between bank lending and deposit rates) denotes a relatively high cost of borrowing. Logistics and trade costs are particularly high in SSA (figure 1.1), in part because of transport inefficiencies, inadequate storage facilities, and underdeveloped distribution systems.⁹

⁵ Consistent with previous Commission reports in this series and to minimize the effect of incomplete trade data from SSA countries, the data presented for exports in this report represent the value of apparent exports (i.e., partner-country reported imports) rather than actual reported exports.

⁶ See USITC, *Sub-Saharan Africa*, 2007; and USITC, *Sub-Saharan Africa*, 2008.

⁷ Total logistics costs include transport, as well as packaging, storage, inventories, administration, and management. See WTO, *World Trade Report 2004*, 2004, 120.

⁸ *Ibid.*, 114–42.

⁹ CARANA Corporation, “The Role of Transportation and Logistics in International Trade,” September 2003, 2.

BOX 1.1 Infrastructure Sectors other than Land and Maritime Transport, and Electricity

Conditions in a number of infrastructure sectors have a considerable effect on general economic development, on the ability of industries to produce and export goods and services competitively, and on public health and welfare in SSA. Important infrastructure sectors not examined further in this report are briefly discussed below.

Air transport is an important shipping mode for high-value and time-sensitive products and for development of SSA's tourism services sector. Improvements in air transport infrastructure have a role in opening up new markets for SSA's exports of both goods and services. According to the WTO, African air transport costs are high relative to other regions.^a Lack of adequate air transport in SSA has constrained the development of SSA's tourism services sector, particularly since a large share of tourists in Africa originate from other countries within Africa and the road networks connecting these countries are generally poor.^b

Information and communication technology (ICT) infrastructure allows suppliers in SSA to communicate with customers, enhance logistics, and market products. Efficient ICT infrastructure promotes just-in-time delivery of goods, as well as cross-border trade in services, some of which depend on telecommunications as the channel for transactions. Access to ICT can improve the competitiveness of industries that face short product life cycles, changing consumer tastes, and rapid technological change, such as consumer electronics and fashion apparel.^c The availability of mobile phones has provided increased efficiency to SSA traders and producers in agricultural markets by linking buyers and sellers and providing improved access to market information.

Financial services institutions such as banks, insurance companies, and investment firms mobilize funds for investment and the development of production capacity. Financial services facilitate international transactions, and the pricing and quality of these services are key components of the costs associated with exports and imports of goods and services.^d The financial services infrastructure in many SSA countries is among the least developed in the world.^e On average, SSA has the highest interest rate spread (the difference between bank lending and deposit rates) among regional groups due to high operating costs. Cash dominates the payment system in many SSA countries because of a lack of adequate financial institutions and payment systems.

Water and sewer infrastructure is a critical input in the production of many goods and services and is crucial for maintaining a healthy workforce. Although SSA benefits from some of the world's largest rivers such as the Congo, Zambezi, Nile, and Niger, as well as Lake Victoria, the world's second-largest lake, shortages of fresh water resources for industrial and household use and irrigated agriculture exist due to uneven distribution and poor management.^f Access to clean water and wastewater treatment facilities is important in the textile industry where dyeing, washing, and finishing operations require an abundance of clean water and generate wastewater that needs disposal. Clean water is also needed to wash coffee, a process that generally increases its value. Lack of access to clean water by SSA households is linked to serious health problems and reduced labor productivity. For example, Africa accounts for 97 percent of the world's cases of onchocerciasis (a parasitic infection), 78 percent of schistosomiasis (a parasitic disease) cases, and 52 percent of trachoma (an eye disease) cases, all of which are water-borne diseases.^g

^a WTO, *World Trade Report 2004*, 2004, 119.

^b Fatokun, "African Air Transport in the 21st Century," 2005, 32. This report estimated that 40 percent of Africa's tourists in 2001 originated from other African countries. For more information on factors contributing to increased exports of aviation services in SSA, see USITC, *Sub-Saharan Africa*, 2008, 4-1-4-18.

^c WTO, *World Trade Report 2004*, 2004, 132.

^d *Ibid.*, 135.

^e CGAP, "Financial Infrastructure," undated (accessed December 13, 2008).

^f World Wildlife Fund, "Facts on Water in Africa," undated (accessed December 16, 2008).

^g UNESCO, "Meeting Basic Needs," undated (accessed December 18, 2008).

TABLE 1.1 Comparison of gross national income (GNI) levels and infrastructure indicators, by region

Indicator	SSA	South Asia	East Asia & Pacific	Middle East & North Africa	Latin America and Caribbean	High-income countries
GNI per capita (US\$) (2007) ^a	952	880	2,180	2,794	5,540	37,566
Infrastructure:						
Electricity consumption (kWh per capita) (2005)	542	432	1,492	1,338	1,715	9,662
Paved roads (percent of total) (2000–2005)	12	57	11	70	24	91
Registered air carrier departures worldwide (millions) (2006)	378	549	2,454	392	1,621	18,477
Fixed line and mobile subscribers (per 100 persons) (2007)	25	27	65	69	85	146
Internet users (per 100 persons) (2007)	4	14	14	16	24	66
Interest spread (lending rate minus deposit rate, percent) (2006)	9	7	6	5	7	5 ^b
Improved water source (percent of population with access) (2006)	58	87	87	89	91	100
Improved sanitation facilities (percent of urban population with access) (2006)	42	57	75	89	86	100

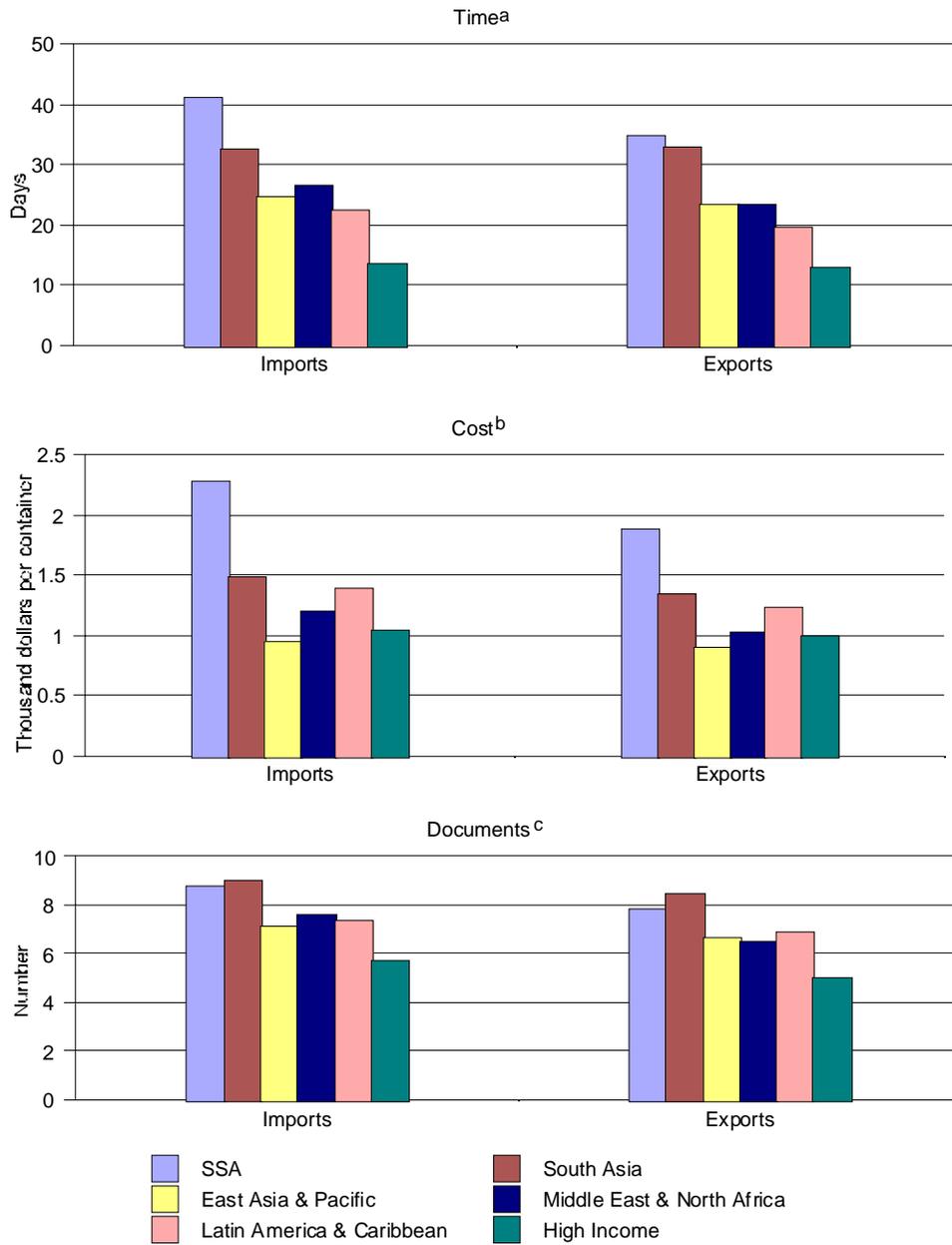
Source: World Bank, World Development Indicators Database.

Note: The presentation of average values in the table masks the variation in the indicators not only across regions, but also within regions. For example, indicators for SSA include South Africa, which has better infrastructure access relative to other countries within SSA.

^aYears in parentheses indicate most current data availability.

^bDatum is for 2004.

FIGURE 1.1 Logistics and trade cost comparison across regions, 2008



Source: World Bank, Doing Business Online Database.

^aTime in days required to import and export. Includes the time for obtaining all documents, inland transport, customs clearance and inspections, and port and terminal handling. Does not include ocean transport time.
^bCost required to import and export. Includes the cost of obtaining all documents, inland transport, customs clearance and inspection, and port and terminal handling. Includes official costs only; no bribes or tariffs.
^cDocuments required to import and export. Includes bank documents, customs clearance documents, port and terminal handling documents, and transport documents.

Improvements in infrastructure provide development benefits to SSA countries by (1) reducing costs and increasing output and productivity of individual producers and businesses, rendering their goods and services more competitive in international markets; and (2) improving living conditions and opportunities, including for the poorer segments of SSA's population. As discussed in more detail in chapter 2, relatively better infrastructure affects production and trade by reducing production costs. For example, power generators, electricity transmission and distribution systems, and road networks are infrastructure stocks that provide services (electricity and transportation) to producers, similar to factors of production such as labor and capital. Increased quantity and improved quality of the stock of infrastructure, such as an upgraded electricity transmission and distribution system or road network, expand the supply and quality of these services and lower production costs, thus creating new profit and trade opportunities.¹⁰ Likewise, with an increase in the supply of infrastructure services, labor and capital become more productive as higher output can be achieved for a given level of labor and capital. Further, increased productivity and lower costs provide firms with added investment incentives.¹¹

Improved infrastructure can also lead to increased production and economic growth through economies of scale, better inventory management, and the use of higher quality and more sophisticated equipment and processes.¹² There are benefits to infrastructure improvements that may also lead to economic growth over time. For example, as noted at the Commission's hearing, apparel production in SSA may be more competitive when it is vertically integrated with on-site or nearby textile production.¹³ But textile production is capital intensive, which can act as a deterrent to investment if the infrastructure necessary for production is not already in place. Infrastructure investment and improved infrastructure conditions could contribute to the development of an expanded textile industry, increase vertical integration of textile and apparel production, and improve the competitiveness of apparel produced in some SSA countries.¹⁴

Improved infrastructure can also contribute to reducing poverty and inequality in SSA countries because access to basic infrastructure services—roads, electricity, clean water, and sewage treatment and disposal systems—is essential to improving quality of life. Infrastructure in most developing regions, including SSA, is characterized by low and unequal access for the poor.¹⁵ Improved infrastructure can reduce this inequality if it also enhances the living standards of the poorest segments of society.¹⁶ Moreover, better infrastructure often improves access to healthcare and education, thereby enhancing individuals' employment and economic opportunities. For example, during the rainy season in Chad, teachers cannot get to schools and people have difficulty reaching the limited medical facilities because of the poor quality of the roads.¹⁷ An improved road

¹⁰ Straub, "Infrastructure and Growth in Developing Countries," January 2008, 6.

¹¹ More specifically, Rodriguez noted that investment in infrastructure raises the marginal product of capital (and possibly of labor), thus raising the incentive to invest in operations. Rodriguez, "Have Collapses in Infrastructure Spending Led to Cross-Country Divergence in Per Capita GDP?" 2007, 2.

¹² Straub, "Infrastructure and Growth in Developing Countries," January 2008, 7.

¹³ For more information on the effect of infrastructure on the textiles and apparel industry, see chap. 6 of this report.

¹⁴ USITC, Hearing transcript, October 28, 2008, 51 (testimony of Paul Ryberg, Africa Coalition for Trade).

¹⁵ World Bank, *World Development Report 2006*, September 2005, 169–70.

¹⁶ *Ibid.*

¹⁷ USITC, Hearing transcript, October 28, 2008, 33 (testimony of the Honorable Christopher Goldthwait, former U.S. Ambassador to Chad).

network could reduce these constraints and provide economic opportunities to Chad's population that come from good health and education.

As discussed throughout this report, infrastructure conditions in SSA have a significant effect on the ability of firms to produce and export goods and services competitively in regional and global export markets. Poor infrastructure conditions in SSA contribute significantly to the relatively higher cost of SSA exports. One study, for example, has shown that costs incurred by producers as a result of poor infrastructure conditions generally outweigh the costs of tariff and nontariff barriers imposed by developed countries.¹⁸ However, the state of SSA's infrastructure is only one of many factors constraining the region's international trade. Although demand growth, increased investment, development of private enterprise, and deeper regional integration, among others factors, have positively affected SSA export performance, political instability, increased competition in key markets, and low crop yields are factors that have negatively affected SSA export performance.¹⁹ In addition, internal and international conflicts, weak governance, poorly developed institutions, low levels of education, corruption, and a constraining business environment continue to hamper SSA export growth.²⁰

¹⁸ Bouet, Mishra, and Roy, "Does Africa Trade Less Than It Should, and If So, Why?" May 2008, 8. This paper cites the role of trade preferences in reducing trade barriers faced by SSA exporters.

¹⁹ USITC, *Sub-Saharan Africa*, table ES-1, 2008, xvi.

²⁰ Portugal-Perez and Wilson, "Lowering Trade Costs," May 31, 2008, 2.

Bibliography

- Bouet, Antoine, Santosh Mishra, and Devesh Roy. "Does Africa Trade Less Than It Should, and If So, Why? The Role of Market Access and Domestic Factors." International Food Policy Research Institute Discussion Paper 00770, May 2008.
- CARANA Corporation. "The Role of Transportation and Logistics in International Trade: The Developing Country Context." Prepared for the U.S. Agency for International Development, September 2003. http://www.tessproject.com/products/special_studies/trans&log_phase_1_report.pdf.
- Consultative Group to Assist the Poor (CGAP). "Financial Infrastructure," undated. <http://www.cgap.org/p/site/c/template.rc/1.26.3229> (accessed December 13, 2008).
- Fatokun, Oladele Samson. "African Air Transport in the 21st Century: A Case Study of the Contrasting Experience of Nigeria and Kenya." Ph.D. diss., Cranfield University, 2005.
- Portugal-Perez, Alberto, and John S. Wilson. "Lowering Trade Costs for Development in Africa: A Summary Overview." Presented at the World Bank Workshop on Trade Costs and the Business Environment: A Focus on Africa, Entebbe Uganda, May 31, 2008. <http://siteresources.worldbank.org/DEC/Resources/Trade-Costs-and-Africa-Draft.pdf>.
- Rodriguez, Francisco. "Have Collapses in Infrastructure Spending Led to Cross-Country Divergence in Per Capita GDP?" United Nations. Department of Economic and Social Affairs. DESA Working Paper no. 52. ST/ESA/2007/DWP/52, July 2007.
- Straub, Stephane. "Infrastructure and Growth in Developing Countries: Recent Advances and Research Challenges." World Bank Policy Research Working Paper no. 4460, January 2008.
- U.S. International Trade Commission (USITC). Hearing transcript in connection with inv. no. 332-447, *Sub-Saharan Africa: Effect of Infrastructure Conditions on Export Competitiveness, Third Annual Report*, October 28, 2008.
- . *Sub-Saharan Africa: Factors Affecting Trade Patterns of Selected Industries: First Annual Report*, USITC Publication 3914. Washington, DC: USITC, 2007.
- . *Sub-Saharan Africa: Factors Affecting Trade Patterns of Selected Industries: Second Annual Report*, USITC Publication 3989. Washington, DC: USITC, 2008.
- United Nations Educational, Scientific and Cultural Organization (UNESCO). "Meeting Basic Needs," undated. http://www.unesco.org/water/wwap/facts_figures/basic_needs.shtml (accessed December 18, 2008).
- World Bank. Doing Business Online Database. <http://www.doingbusiness.org/ExploreTopics/TradingAcrossBorders/> (accessed various dates).
- . World Development Indicators Database. <http://web.worldbank.org/WBSITE/EXTERNAL/DATASTATISTICS/0,,contentMDK:21725423~pagePK:64133150~piPK:64133175~theSitePK:239419,00.html>.

———. *World Development Report 2006: Equity and Development*. Washington, DC: World Bank, September 2005.

World Trade Organization (WTO). *World Trade Report 2004*. Geneva: WTO, 2004.
http://www.wto.int/english/res_e/booksp_e/anrep_e/world_trade_report04_e.pdf.

World Wildlife Fund. "Facts on Water in Africa," undated.
<http://assets.panda.org/downloads/waterinafricaeng.pdf> (accessed December 16, 2008).

CHAPTER 2

Synthesis and Implications of Findings

Poor conditions in the SSA land transport, maritime transport, and electricity infrastructure sectors increase both the direct and indirect costs of producing and exporting goods and services, thereby reducing the export competitiveness of a wide range of SSA industries. This chapter examines how poor infrastructure conditions manifest themselves in terms of increased (1) production costs, (2) economic distance (the time and cost associated with transporting goods), and (3) business uncertainty, and how each of these factors affects the general export competitiveness of SSA, as well as select SSA industries examined in chapter 6 of this report.¹ These three factors interact with each other in various ways and vary among industries and countries within SSA. Although the effects of infrastructure conditions on production costs, economic distance, and business uncertainty are widely recognized within SSA, there is relatively little internationally comparable quantitative data available to assess these effects. As a result, this chapter relies primarily on descriptive information presented in subsequent chapters of this report. Where appropriate, material presented in this chapter is supplemented with quantitative information derived from other studies or from primary statistical information.²

Infrastructure and Production Costs

High transport and electricity costs are embedded in production costs and are incorporated into the delivered price of products. Increases in production costs resulting from high transport and electricity costs reduce export competitiveness directly. More specifically, poor quality transportation networks in SSA increase the costs of acquiring inputs, such as hides and skins for leather production in Ethiopia, or textiles for apparel production in Kenya. Likewise, electricity generation in much of SSA, whether grid-based or using on-site generators, operates on small scales by international standards. As a result, electricity costs per kilowatt hour (kWh) are particularly high. High electricity costs reduce the competitiveness, or inhibit the expansion, of SSA's main electricity-intensive exports, such as metals, chemicals, and textiles. The following sections describe the effects of infrastructure conditions on direct production costs, and how high production costs affect both technology substitution and the composition of SSA exports.

Direct Production Costs

Because transport costs are embedded in the cost of producing goods, the condition of land transport and maritime infrastructure has a direct effect on the costs of procuring needed production inputs, particularly for landlocked countries. SSA apparel exports rely largely on imported textile inputs that, in many cases, must be transported to domestic production facilities via both land and maritime transportation networks. Processed

¹ For more detailed information on the effects of infrastructure conditions on the export competitiveness of select SSA industries, see chap. 6 of this report.

² Information in this chapter is cited when not presented elsewhere in this report.

agricultural products also require inputs from a variety of sources, as well as packaging materials, which must be transported.

As discussed in chapter 5, SSA's electricity infrastructure is the least developed, most costly to operate, and highest priced of any region in the world (with a few exceptions—notably, South Africa). Power generation facilities can offer cheaper power when they can operate at large scales. However, total national power output in most SSA countries is well below the level that could be served by even a single U.S. plant operating using current technology at reasonable scale economies. According to World Bank data, national electricity production in 2005 was less than 10 million megawatt hours in all but 3 SSA countries.³ By comparison, the output of the Mount Storm power station in West Virginia, the 97th largest electricity generation plant in the United States, was approximately 10 million megawatt hours in 2007.⁴ Mount Storm generates approximately the same amount of electricity per year as Côte d'Ivoire, Namibia, and Senegal combined. Moreover, the widespread use of small-scale power generators—necessary because many firms in SSA either lack access to grid-provided electricity or suffer from frequent electricity shortages even if connected to an electrical grid—require costly fuel to operate, raising the cost of electricity to producers.

Costly electricity increases production costs across a wide range of industries in SSA. For example, tropical fruit producers in Ghana reported that they could reduce energy costs by up to 60 percent if connected to reliable grid power instead of using more expensive on-site generators. A large tropical fruit exporter in Ghana estimated that generator costs account for 15 percent of total costs, and total costs would decrease by 7.5 percent if operations were connected to the electricity grid. In Kenya, apparel exporters reported that electricity generated by diesel power is 20 percent more expensive than from the grid. Finally, an industry official in Nigeria stated that poor infrastructure conditions, particularly electricity conditions, make tire production there about 40 percent more expensive than in other countries.

Technology Substitution

When faced with high-cost and low-quality infrastructure services, firms in SSA may attempt to lower their production costs by substituting labor-intensive technologies for capital-intensive technologies that require more electricity. For example, all steps of shea butter production can be and are often done by traditional hand methods. However, several steps, including milling and kneading, can be performed in villages with small-scale electrically powered machines (figure 2.1), but the use of these methods is limited not only by the cost of the equipment, but also by the high cost and unreliability of electricity. Electricity prices for shea butter producers in Burkina Faso amount to \$0.49 per kWh, compared with \$0.004 to \$0.233 per kWh in most other countries around the world.⁵ Improved electricity infrastructure could lead to more widespread use of medium-scale technologies, reducing the burden of hand labor and increasing the productivity and incomes of rural workers.

³ World Bank, World Development Indicators Database (accessed March 27, 2009).

⁴ USDOE, EIA, "100 Largest Electric Plant Net Generation, 2007," February 2009.

⁵ For comparison rates, see USDOE, EIA, "Electricity Prices for Industry," undated (accessed February 5, 2009). Data are for 2006.

FIGURE 2.1 Technological substitution in the production of shea butter



Shea butter producers in Ouagadougou, Burkina Faso, perform hand-kneading operations (foreground), and have one machine to perform electrically powered kneading (background). Burkina Faso's electricity is among the costliest in the world. Relatively less expensive electricity would lead to substitution of mechanized kneading for hand kneading.

Source: USITC.

The ability to fully exploit the technologies available with relatively less costly and more reliable electricity may be limited by the availability of complementary factors, such as access to clean water or affordable capital. For example, the sorting and testing of tropical fruit in SSA is often performed by visual inspection methods, with workers consulting a chart to indicate quality.⁶ In more developed countries, such sorting is often accomplished by laser-based optical technologies using costly equipment.⁷ Coffee washing is a production technology that generally adds value to the coffee bean. However, coffee washing is limited in SSA, in part due to the lack of reliable electricity to pump clean water needed to wash coffee. As a result, the alternative technology of sun drying is used, which contributes to reduced coffee bean quality and lower returns to

⁶ Industry official, interview by Commission staff, Awutu Efutu Senya, Ghana, October 28, 2008.

⁷ For a discussion of laser-based optical sorting technology in fruit, see Edwards, *Detecting Foreign Bodies in Food*, 2004.

producers. Access to reliable electricity is also important in cases where laboratory testing is necessary to ensure a certain product quality or composition for the customer.⁸

Infrastructure and Export Profiles

High-cost and low-quality infrastructure services increase the production costs of certain products more than others. At the same time, poor infrastructure conditions affect both the type of goods SSA exports and the extent to which SSA countries undertake downstream processing of basic commodities that they produce. Table 2.1 compares the cost share of electricity (electricity intensity) of various products in SSA with the propensity of SSA to export those products. There are electricity-intensive products of which SSA exports a high portion of the world total, despite having poor electricity infrastructure conditions, because of its advantages in natural resource endowments and agro-climatic conditions. These products include nonferrous and ferrous metals, miscellaneous minerals, coal, plant-based fibers such as cotton,⁹ and sugar cane and beet. For these products, SSA's global market share could increase if electricity infrastructure conditions improved. In contrast, there are also electricity-intensive products of which SSA exports relatively little, including wheat; manufactured mineral products; chemicals, rubber, and plastics; paper and pulp; and textiles. In the case of these products, the high cost and unpredictability of electricity supplies may reduce export competitiveness. Improved electricity infrastructure conditions could improve the competitiveness of SSA producers and exporters and also support an increased global market share for SSA exports.

The ability of SSA countries to engage in downstream processing of basic commodities may be constrained by poor conditions in land and maritime transport infrastructure as well. SSA exports a significant amount of crude petroleum, but relatively few refined petroleum products and even fewer chemicals—products that require complex production processes and adequate and reliable electricity supplies. SSA countries also have a low share of global exports in industries that have a low production cost share of electricity (e.g., electronics, machinery, and motor vehicles), as these industries are often characterized by global supply chains that rely on efficient and timely multi-modal transportation networks. However, SSA's weak transport infrastructure increases the cost and time associated with importing needed production inputs and exporting final products, effectively increasing economic distance between SSA and the rest of the world.

Infrastructure and Economic Distance

The economic distance between two countries, or two regions within a country, can be measured by the costs incurred, or the time required, to ship goods from point to point. Increased economic distance can raise production costs indirectly by impeding producers' efforts to exploit economies of scale to reduce unit production costs, which further erodes export competitiveness. Furthermore, the costs of moving goods from producers to consumers also depend on the quality of transport and associated services, such as customs and freight forwarding. Varying infrastructure conditions can even make transporting products more costly and untimely over some shorter distances than over

⁸ Industry official, interview by Commission staff, Ouagadougou, Burkina Faso, October 23, 2008.

⁹ The cotton ginning process uses a significant amount of electricity.

TABLE 2.1 Electricity intensity of production and export share of sub-Saharan Africa

SSA share of global exports	High electricity intensity of production	Medium electricity intensity of production	Low electricity intensity of production
High	Nonferrous metals Ferrous metals Miscellaneous minerals Coal Plant-based fibers Sugar cane and beet	Sugar, manufactured Fruits and vegetables Wool Misc. crops Misc. food products	Crude petroleum Forestry products
Medium	Petroleum and coal products	Meat products Vegetable oils and fats Natural gas	Fisheries products Beverages and tobacco Apparel
Low	Wheat Manufactured mineral products Chemicals, rubber, plastics Paper and pulp Textiles	Fabricated metals Processed rice Milk	Motor vehicles Electronics Industrial machinery Other transport equipment

Source: 2004 data from GTAP version 7 database. The medium range for SSA exports is 1–2 percent of global exports. The medium range for electricity intensity of production is 1–5 percent of total costs, calculated on a global basis. Industries shown are illustrative, rather than comprehensive.

longer ones. For example, it can take one tropical fruit producer in Ghana approximately one hour to transport produce for export 100 kilometers (km)¹⁰ to the port of Tema, Ghana while it can take another producer in Ghana approximately three times longer to transport produce to the same port from a shorter distance of 70 km because of poor road conditions.

Transport Costs

The difference between the prices received by producers and the prices paid by consumers provides a direct indicator of economic distance.¹¹ For example, Rwandan coffee is transported over 1,500 km on roads of variable quality via Uganda to the port in Mombasa, Kenya, or alternately by road and rail to Dar es Salaam, Tanzania. Transport costs may represent up to 40 percent of total costs of Rwandan coffee exports. One apparel producer near Nairobi, Kenya, estimated that improvements in all aspects of the transport process, including ports, roads, and customs procedures, could lower total costs by 10–40 percent and improve the firm’s competitiveness.

Although all stages of land transport may be costly and time consuming, the initial stages can be particularly costly because of the poor quality of feeder roads, which connect inland, and often rural, locations to more centralized processing or market locations. For example, shea nuts sold in provincial capitals in Ghana and Burkina Faso may fetch double or triple the price paid to the farmer in remote local villages. The most difficult villages to reach (albeit not necessarily the farthest) receive the lowest prices. The discount reflects the fact that fewer truck drivers are willing to drive on poor roads in which they may lose an axle or arrive at a washed-out bridge that has not been repaired. These considerations reduce the number of trucks available for hire and consequently

¹⁰ One kilometer is approximately equal to 0.6 miles.

¹¹ There are other reasons for high prices in urban areas, such as higher consumer income. It is therefore important for purposes of understanding infrastructure quality to focus on the difference between prices paid by the seller and those received by the buyer.

raise the price of trucking services. Economic distance can also be increased by the indirect costs of lost production from damage, spoilage, or mishandling in transit. Approximately 15–20 percent of fruit delivered by out-growers (small producers at dispersed locations) in Ghana on feeder roads to nucleus farms is rejected because of damage to the fruit while in transit.

Improved road infrastructure can raise the income of village producers by increasing the supply of trucking services and thus lowering transportation costs. Improved roads can promote competition between trucking companies willing to drive on better roads and also encourage complementary investment in both commercial and personal vehicles, as expected maintenance and depreciation costs are reduced, which further increases trucking supply.¹²

Sometimes relatively modest investments or small changes in policies can significantly reduce transport times. For example, the distribution of bicycles to Rwandan coffee exporters through a U.S. Agency for International Development (USAID)-funded program reduced transit times from harvest to central processing stations by two-thirds, thereby reducing the potential of bean deterioration and enabling greater access to quality-enhancing coffee washing stations. Similarly, appropriately designed pricing schemes for the delivery of tapped rubber in Côte d’Ivoire provide incentives for farmers to choose the most efficient methods of transport.

In some cases, increased demand to reach a particular remote location can stimulate investments in infrastructure, thereby improving infrastructure conditions and reducing economic distance. For example, investments in road paving and electrification have increased accessibility along “the Obama route” for tourists to visit the home of President Barack Obama’s father in the village of Nyang’oma Kogelo, Kenya.

Transport Time

Speed to market is increasingly valued in international trade, and slow delivery effectively increases costs. For some products, including simple manufactures and storable raw materials such as crude petroleum, speed to market is relatively less important. In contrast, speed to market is crucial for perishable products, such as agricultural goods, or products that become obsolete in the marketplace because of technological change (e.g., electronics) or shifting consumer preferences (e.g., fashion apparel). Consumers around the world increasingly demand products with precise characteristics and are willing to pay to have them delivered quickly. Moreover, with the segmentation of production processes for goods such as electronics—for which components are sourced from many countries—success in the marketplace requires the coordination of “just-in-time” delivery among widely dispersed production facilities.¹³ Effective participation in these dispersed supply chains requires the necessary transport infrastructure to satisfy the requirement for quick and reliable delivery times. One way that SSA apparel firms have compensated for a lack of efficient transport infrastructure has been to concentrate on production of low- to mid-range, commodity-type apparel products where speed to market is relatively less critical.

The time required to export and import goods, including inland transport, customs clearance, and port clearance, is greater in SSA than in any other region of the world. In

¹² Industry official, interview by Commission staff, Kasalgu, Ghana, October 21, 2008.

¹³ Hummels, et al., “Calculating Tariff Equivalents for Time in Trade,” March 2007, 3.

2007, the average time to export from SSA was 18.9 days, of which nearly one-half consisted of customs clearance, whereas the average import time was 28.5 days, divided about evenly among inland transport, customs, and ports.¹⁴ According to one study, the costs of a one-day delay in delivery of internationally traded goods, as a percent of the final product cost (“tariff-equivalent” costs), are estimated to be 0.7 percent for apparel; 0.9 percent for vegetables, fruit, and telecommunications equipment; 1.1 percent for coffee, tea, cocoa, and spices; and 2.0 percent for road vehicles.¹⁵

Although coffee exports from both Rwanda and Colombia enter the United States free of duty, Rwanda needs almost three times longer to export (42 days) than does Colombia (14 days),¹⁶ implying that Rwandan coffee exports face a significantly higher tariff equivalent than Colombian coffee exports. Applying the above estimate that the cost of a one-day delay in coffee shipments is equivalent to 1.1 percent ad valorem, the additional delays in exporting coffee from Rwanda are equivalent to approximately a 36 percent tariff equivalent relative to exporting from Colombia.¹⁷

Estimates based on simulation methods show that a 50 percent reduction in the time required to export from SSA would lead to a 2.2 percent increase in the region’s gross domestic product (GDP), whereas a similar reduction in the time required to import would lead to a 4.2 percent increase.¹⁸ Such reductions in the time to trade would also likely be associated with significant diversification in exports away from most primary products and toward manufactures, as well as toward higher-value agricultural products such as vegetables, fruits, and nuts.¹⁹

Economies of Scale

Reducing economic distance also makes it possible to exploit economies of scale in production because producers are able to source inputs from a wider range of suppliers and sell goods to a larger market. For example, natural rubber factories in SSA achieve reasonable scale economies by sourcing from out-growers. The scale economies can compensate for certain cost disadvantages associated with transporting cup rubber from out-growers to the factory.²⁰

Economic distance between the same two points can differ for SSA exporters and multinational exporters, due in part to differences in resources and access to capital. Access to superior logistics and financing can create a significant competitive advantage for large (often foreign) firms by reducing economic distance and enabling the

¹⁴ Ibid., 5. These figures differ from those presented in figure 1.1 of this report because they are derived from the World Bank’s *Doing Business 2007* report rather than *Doing Business 2009*, and because they exclude time to complete documentation, since importers and exporters may work on documentation while production is already underway.

¹⁵ Ibid., 8.

¹⁶ Includes the time required to obtain all appropriate documents, inland transport, customs clearance and inspections, and port and terminal handling. Does not include ocean transport time. World Bank, *Doing Business Online Database*, 2009 data (accessed February 12, 2009).

¹⁷ The 36 percent estimate is a Commission staff calculation, and includes daily compounding.

¹⁸ Minor and Tsigas, “Impacts of Better Trade Facilitation in Developing Countries,” June 2008, 12–13.

¹⁹ Ibid., 17.

²⁰ Cup rubber is natural rubber in its original state as tapped from the rubber tree and gathered in a cup. Cup rubber loses water from evaporation during transport. Natural rubber factories would prefer to pay for dry rubber equivalent, but must weigh the rubber at the out-growers’ location, where the water content is higher. This implies a higher cost per weight of usable rubber.

exploitation of scale economies. Well-financed foreign firms are often better able to take advantage of economies of consolidation by extending their operations throughout the supply chain and utilizing their own trucks and warehouses. Smaller SSA firms, in contrast, may find it difficult to obtain scale economies through consolidation. For example, shea nuts are often exported in mass quantities to Europe by foreign firms, where they can be processed in larger overseas factories that benefit from scale economies. Smaller local firms, on the other hand, are more likely to gather shea nuts over a relatively small area and produce and export shea butter in smaller quantities, without the benefit of scale economies.²¹ Likewise, it may require the consolidated output of several hundred coffee farms in East Africa to fill one shipping container of exportable green (unroasted) coffee.

Infrastructure and Uncertainty

Poor infrastructure in SSA makes transportation not only slow and costly, but also unreliable. Truck arrival times to transport products to port for export can be unpredictable; goods may be delivered to the customer late, not at all, or in an unusable state, thus damaging the reputation of the exporter. Similarly, electricity is subject to frequent and unpredictable outages. An electrical outage may shut down production lines midstream, damaging semi-finished products. Even if transport and electricity costs are relatively low, uncertainty often compels firms to invest in capacity that would otherwise be redundant, such as electric generators.

Uncertainty created by poor infrastructure conditions substantially raises production risk and discourages investment and production. It can also lead to higher production costs and lower returns to producers. For example, poor road conditions between slaughtering facilities and tanneries in Ethiopia often lead to damaged rawhides and skins, and is one of a number of factors contributing to the large and unpredictable rejection rate at tanneries, ranging from 20 to 80 percent. Because quality is often not discernable in untanned hides, prices paid by tanneries are low to help offset the costs associated with rejecting an unknown portion of hides and skins; nevertheless, damaged hides and skins increase production costs to tanneries. In addition, uncertainty is introduced into the quantity of tanned leather available for export. Infrastructure investments, to the extent that they reduce uncertainty, can increase the profitability of exporting and promote complementary investments in production facilities.

Uncertainty in Truck and Ship Arrival Times

The unpaved and potholed condition of many roads in SSA leads to breakdowns of trucks used for export. Likewise, a lack of resources to repair washed-out bridges, delays due to roadblocks and checkpoints, and occasional hijackings also contribute to highly unpredictable truck arrival times at the port. If warehouse capacity at the port is insufficient, trucks may serve as ad hoc warehouses until the ship arrives, exposing goods to the risk of theft, and drivers may need to be compensated for food and lodging in the port city while awaiting the ship. Further, delays may lead to spoilage of perishable goods. Conversely, trucks may also arrive too late and miss the ship, as arrival times for container lines are uncertain, in part because of accumulated delays at previous port calls.

²¹ Industry officials, interview by Commission staff, Accra, Ghana, October 20, 2008; industry official, interview by Commission staff, Tamale, Ghana, October 22, 2008.

Moreover, fewer containers may be loaded onto the ship than were contracted for, requiring some of the goods to be left behind on the dock. Ships that are loaded but unable to leave the port on schedule because of logistical inefficiencies may incur port charges for demurrage,²² another unpredictable event. If perishable produce arrives at import markets in a spoiled state, exporters may receive no compensation, and claims may be filed against shipping lines for the losses incurred by the importer.²³

Producers and exporters in SSA may adapt production and shipment schedules in response to uncertainty in ship arrival times. For example, in central Ghana, pineapples must be harvested and de-greened 9–10 days before they are loaded onto trucks for the three-hour journey to the port of Tema. In order to choose the right day to harvest, growers must consult not only the weather, but also reports about congestion at the port in Nigeria, where ships often stop en route to Tema. Nevertheless, the information can still be imperfect, and trucks may still arrive early or late.

Uncertainty in Electrical Power Supply

The uncertainty associated with electric brownouts and blackouts affects production to varying degrees. Entire phases of the production process, such as those depending on heating, may need to be restarted as the result of a 15-minute outage.²⁴ Various stages of textile and apparel production, such as dyeing and cutting, are adversely affected by unreliable electricity; an entire textile dye lot can be ruined by load shedding.²⁵ In many other industries, similar intermittent electricity failures lead to the wastage of semi-finished products. Producers that require reliable electricity to serve an export market, such as rubber exporters in Côte d'Ivoire that sell to tire factories in North America, may incur the additional expense of installing large-scale diesel or natural-gas powered generating capacity to reduce the uncertainty of unreliable grid electricity.²⁶ Such technologies have not been widely used as a primary source of electricity in the United States for nearly a century.²⁷ Finally, many hotels at tourist locations require generators to limit the impact of load-shedding on visitors, adding to the cost of, and potentially reducing demand for, a vacation to destinations with unreliable electricity supplies.

²² *Demurrage* refers either to the detention of a ship beyond the time allowed for loading, unloading, or sailing, or to monetary charges associated with such detention.

²³ Industry official, interview by Commission staff, Abidjan, Côte d'Ivoire, October 30, 2008.

²⁴ Industry official, interview by Commission staff, Accra, Ghana, October 20, 2008.

²⁵ Load-shedding involves scheduled or unscheduled power outages for certain areas due to lack of sufficient capacity to fully meet demand.

²⁶ Industry official, interview by Commission staff, Abidjan, Côte d'Ivoire, October 31, 2008.

²⁷ Freeman and Soete, *The Economics of Industrial Innovation*, 1997, 75–80.

Bibliography

Edwards, Mike. *Detecting Foreign Bodies in Food*. Cambridge, UK: Woodhead Publishing, 2004.

Freeman, Chris, and Luc Soete. *The Economics of Industrial Innovation*. 3rd ed. Cambridge, MA: MIT Press, 1997.

Hummels, David, Pete Minor, Matthew Reisman, and Erin Endean. "Calculating Tariff Equivalents for Time In Trade." Prepared by Nathan Associates, Inc. for the U.S. Agency for International Development, March 2007.

Minor, Peter, and Marinos Tsigas. "Impacts of Better Trade Facilitation in Developing Countries: Analysis with a New GTAP Database for the Value of Time in Trade." Prepared by Nathan Associates, Inc. for the 11th Annual GTAP Conference, Helsinki, Finland, June 2008.

U.S. Department of Energy (USDOE). Energy Information Administration (EIA). "Electricity Prices for Industry," undated. <http://www.eia.doe.gov/emeu/international/elecprii.html> (accessed February 5, 2009).

———. "100 Largest Electric Plant Net Generation, 2007," February, 2009. <http://www.eia.doe.gov/neic/rankings/rankbyplantgeneration.htm>.

World Bank. Doing Business Online Database. <http://www.doingbusiness.org> (accessed February 12, 2009).

———. World Development Indicators Online Database. <http://www.worldbank.org> (accessed March 27, 2009).

CHAPTER 3

Land Transport

The quality of land transport infrastructure is correlated with output, productivity, growth rates, land value, and market development.¹ High-quality land transport infrastructure facilitates economic activity, improves access to health care and education, raises social welfare by bringing consumer goods to rural areas, and facilitates social integration. In SSA, long distances, border delays, underinvestment in infrastructure, and inefficient trade and transport policies result in high land transport costs and low land transport quality. This impedes the movement of labor and goods, reduces transmission of knowledge and technology, and reduces export competitiveness by raising both the prices of imported inputs and the costs of transporting final goods to market. To reduce land transport infrastructure deficiencies, SSA countries are engaged in reforming management and finance, increasing investment, and promoting regional cooperation.

Conditions of the Land Transport Sector

Land Transport Infrastructure

SSA roads and railways are in poor overall condition. Over the last several decades, SSA has lagged behind other regions of the world in quantity and quality of land transport infrastructure and has made slower progress in improving maintenance and management of infrastructure. In some respects, SSA's infrastructure quality has worsened in absolute terms.²

Geographically, SSA countries vary widely in size, and many countries have low population densities and low levels of urbanization. Many SSA countries are small and/or landlocked, with landlocked countries accounting for 40 percent of SSA's total population.³ Seventy percent of SSA's rural population lives more than 2 km from an all-weather road,⁴ so bicycles and walking constitute a greater percentage of transport needs in many rural areas than motorized vehicles.⁵ Some SSA countries have topographical features (such as Rwanda's hills, or erosion-susceptible coasts in Togo and Benin) that add to the expense of building and maintaining land transport infrastructure. Weather is also a problem, with heavy rains flooding main roads and long dry seasons rendering rivers unnavigable. For example, the Central African Republic (CAR) has two primary transit corridors: one, through Cameroon, is often impassable in the rainy season, and the other, involving transit down the Oubangui River, is unnavigable in the dry season.⁶

Land transport in SSA is not only time consuming and expensive but highly variable, both in trip length and in the condition of cargo upon arrival. Roads are sometimes flooded, and trains often do not leave on time. In addition, political instability increases

¹ Calderon and Servén, "Infrastructure and Economic Development," September 2008, 2.

² Ibid., 15.

³ Ibid., 2.

⁴ Raballand and Teravaninthorn, *Transport Prices and Costs in Africa*, 2009, xi.

⁵ Pedersen, "Freight Transport under Globalization," 2001, 96.

⁶ Faye, et al., "The Challenges Facing Landlocked Developing Countries," March 2004, 44.

the likelihood of corruption or robbery, and customs officials may delay or deny entrance or confiscate goods. Trucks in Ghana traveling from Paga (on the northern border with Burkina Faso) to Tema (on the Gulf of Guinea) take two to four days under normal conditions, but an estimated 10–20 percent of trucks are delayed by a week or more; moreover, if a truck breaks down on this route, it can take up to three weeks to procure a mechanic from Kumasi in south-central Ghana.⁷ Unreliable supply chains force producers to invest in supply chain redundancy and hold large inventories as hedges (one beer wholesaler in rural Cameroon stockpiled up to five months' inventory at the beginning of each rainy season).⁸ These costs discourage investment in modern services, including those that would make supply chains more reliable (such as warehousing infrastructure and information technology).⁹

Most land transport in SSA takes place along various transnational corridors or routes that link economic centers with each other and with ports (table 3.1 and figure 3.1). Transport practices, prices, and costs tend to be corridor specific. Many SSA corridors are formally designated as such and are overseen by agencies established through multilateral treaty or memoranda of understanding; oversight agencies attempt to reduce transit times and costs by coordinating member country policies and investments.¹⁰ Producers find it advantageous to have multiple corridor alternatives. For example, copper mining companies in Zambia have an explicit policy of maintaining alternative corridor routes in order to receive competitive shipping service.¹¹ Investments that improve average infrastructure quality on a transit corridor may not be effective if they do not improve conditions in the transit country with the worst infrastructure conditions, as business managers considering overland shipments base their decisions on the riskiest and most time-consuming portion of the trip.¹²

Roads

There are about 2 million km of roads in SSA, with a replacement cost estimated in 2001 to be \$170 billion.¹³ SSA has the lowest road density, measured by kilometers of road per 1,000 square kilometers of land, of any developing region in the world: 49 km/km² of paved roads (compared with 482 km/km² of paved roads in the Middle East and North Africa), and 152 km/km² of total paved and unpaved roads (compared with 740 km/km² in Latin America and the Caribbean).¹⁴ Roads are the primary link between dense urban areas and agriculturally productive rural areas and account for more than 80 percent of total freight and passenger movement in SSA.¹⁵

Roads in SSA have lost nearly one-third of their value due to underinvestment and continuous deferral of maintenance,¹⁶ and there are fewer kilometers of roads in Africa

⁷ Industry officials, interview by Commission staff, Accra, Ghana, October 28, 2008.

⁸ *Economist*, "The Road to Hell is Unpaved," December 19, 2002.

⁹ Raballand, "The Cost of Being Landlocked in Africa," February 21, 2008.

¹⁰ Key performance indicators for corridor management include traffic volumes, transport prices, turnaround time for trucks, port dwell time, and border post transit times.

¹¹ Raballand, Kunaka, and Giersing, "The Impact of Regional Liberalization," January 2008, 5.

¹² Buys, Deichmann, and Wheeler, "Road Network Upgrading," December 2006, 12.

¹³ Simuyemba, "Linking Africa Through Regional Infrastructure," 2000, 12; Nyangaga, "Reforming Road Management," March 2001, 1.

¹⁴ Foster, et al., "Building Bridges," 2008, 24.

¹⁵ Dierks, "A Case for Namibian Roads Conservation," December 28, 2000.

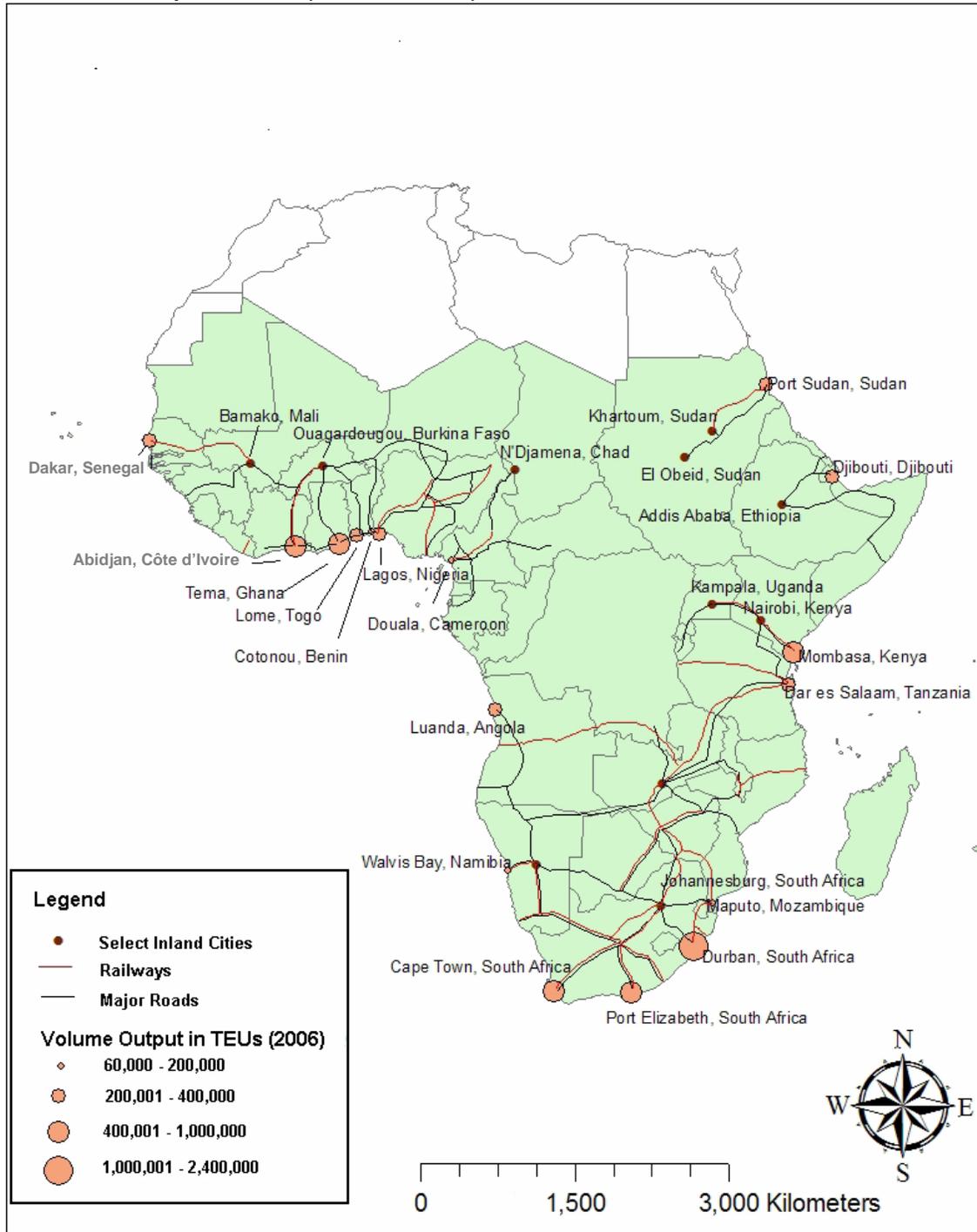
¹⁶ Nyangaga, "Reforming Road Management," March 2001, 1.

TABLE 3.1 Select land transport corridors in sub-Saharan Africa

Corridor	Countries involved	Culminating port	Institutional arrangements for trade facilitation
Northern Corridor	Democratic Republic of the Congo (DRC), Burundi, Rwanda, Uganda, Kenya	Mombasa, Kenya	Northern Corridor Transit Transport Coordination Authority (NCTTCA) (1985)
Central Corridor	DRC, Burundi, Rwanda, Tanzania	Dar es Salaam, Tanzania	Central Corridor Transit Transport Facilitation Agency (2006), modeled on NCTTCA
Dar es Salaam Corridor	Zambia, Malawi, Tanzania	Dar es Salaam, Tanzania	Dar es Salaam Corridor Coordinating Committee (2003), based on transport coordinating committee founded in 1960s
Walvis Bay Corridors (3 branches)	South Africa, Botswana, Namibia (Trans-Kalahari); Zambia, Angola, Namibia (Trans-Caprivi); Angola, Namibia (Trans-Cunene)	Walvis Bay, Namibia	Walvis Bay Corridor Group (2000), a public-private partnership; and Trans-Kalahari Corridor Management Committee (2003)
Maputo Corridor	South Africa, Mozambique	Maputo, Mozambique	Maputo Corridor Logistics Initiative (2004), incorporated as a nonprofit in South Africa
Abidjan-Lagos Corridor	Côte d'Ivoire, Ghana, Togo, Benin, Nigeria (branches linking Mali, Burkina Faso, Niger)	Multiple West African ports	Bilateral proposals for cross-border corridor management committees facilitated by the Economic Community of West African States
North-South Corridor	DRC, Zambia, Zimbabwe, Botswana, South Africa (branches linking Tanzania and Malawi)	Durban, South Africa	Various domestic, bilateral, and regional arrangements (including involvement by COMESA, EAC, and SADC)

Sources: Adzibgey, Kunaka, and Mitiku, "Institutional Arrangements for Transport Corridor Management in Sub-Saharan Africa," October 2007; Pearson, "The North-South Corridor," October 11, 2008.

FIGURE 3.1 Major land transport routes and ports in sub-Saharan Africa



Sources: Adapted from OECD, *Africa Economic Outlook 2007/2008* 2008, 12; and Degerlund, ed., *Containerization International Yearbook 2008*, 2008, 157–69.

Note: TEU refers to a twenty-foot equivalent unit, the cargo capacity of a standard shipping container 20 feet long and eight feet wide.

today than there were 30 years ago.¹⁷ By one estimate, \$12 billion of preventive maintenance in the 1970s and 1980s could have prevented \$45 billion in SSA road value loss.¹⁸ The absence or poor enforcement of axle-load regulations contributes to overuse of roads: the relationship between axle weight and inflicted damage to pavement is not linear but exponential, and overloading trucks (which maximizes revenue given a limited number of trips) raises the maintenance costs and shortens the life expectancy of roads. In turn, poor roads damage vehicles, reduce tire lifespan and vehicle utilization, and reduce fuel efficiency to as little as 100 km per 50 liters (4.7 miles per gallon) for vehicles that often are already old and poorly maintained.¹⁹ Maximum driving speeds are low, as vehicles need to slow down to avoid potholes or navigate uneven terrain. The average daily speed of a freight-hauling truck in France is 69 km per hour, compared with 30 km per hour in Central Africa.²⁰ A fully laden truck requires up to three days to travel 485 km from Nairobi to Mombasa in Kenya,²¹ and up to four days to travel 500 km from Douala to Bertoua in Cameroon.²²

Even adequate SSA roads are not necessarily able to deal with large increases in traffic volumes. Economic development in South Africa has rapidly increased the use of the N3 Johannesburg-Durban road, which carried the same amount of traffic over the past 3 years as it had in the previous 20.²³ Plans to construct and maintain roads are based upon traffic forecasts that may quickly become outdated during periods of rapid growth in freight movement.

When road infrastructure is sufficiently poor, drivers take alternate routes that often require longer travel times. For example, Burundi's most direct route to the coast is through neighboring Tanzania, but infrastructure along this route is so poor that the primary Burundian transit route to Mombasa is via Rwanda, Uganda, and Kenya, an additional 600 km.²⁴ Due to bridges washing out in Togo, many freight shipments from northern Togo must travel to Tema, Ghana, via Ouagadougou, Burkina Faso, a detour of an estimated 1,750 km that contributes to overuse of and damages to Burkinabé roads.²⁵

Railways

Rail capacity in SSA has declined due to infrastructure deterioration and endemic unreliability in operations (breakdowns and delays are frequent). In the 1980s, there were 20,000 km of rail lines in southern Africa, but only 10,000 km were in use in 2002.²⁶ In Zambia, total freight carried by rail fell from 6 million tons per year in 1975 to less than 1.5 million tons per year in 1998.²⁷ Swaziland's Swazi Rail currently moves less than 1 million tons of import and export rail traffic per year, less than when the rail line was built in 1964 (it carried large volumes of iron ore at that time), and Swazi trains are not

¹⁷ Raballand and Teravaninthorn, *Transport Prices and Costs in Africa*, 2009, xi.

¹⁸ Brushett, "Management and Financing of Road Transport Infrastructure in Africa," March 2005, 4.

¹⁹ Raballand and Teravaninthorn, *Transport Prices and Costs in Africa*, 2009, 69.

²⁰ Raballand and Macchi, "Transport Prices and Costs," September 27, 2008, 5.

²¹ Faye, et al., "The Challenges Facing Landlocked Developing Countries," March 2004, 58.

²² *Economist*, "The Road to Hell is Unpaved," December 19, 2002.

²³ Industry officials, interview by Commission staff, Johannesburg, South Africa, October 15, 2008.

²⁴ Faye, et al., "The Challenges Facing Landlocked Developing Countries," March 2004, 44.

²⁵ Industry officials, interview by Commission staff, Ouagadougou, Burkina Faso, October 23, 2008.

²⁶ De Jong, "South Africa: Railway Heritage At Risk," 2002.

²⁷ Raballand, Kunaka, and Giersing, "The Impact of Regional Liberalization and Harmonization,"

January 2008, 4. All tons are metric tons. One metric ton is approximately equal to 1.1 net tons.

always able to meet minimal load requirements at ports.²⁸ Even in South Africa, the SSA country with the most developed rail sector, current capacity on the railway connecting manganese mines to Port Elizabeth is 3.5 million tons per year, whereas demand is approximately 4.2 million tons per year.²⁹ The Johannesburg–Durban rail line is currently operating at about 25 percent capacity due to operational inefficiencies and congestion.³⁰ As with road transport, rail transport in SSA can be protracted and unreliable: the 1,145 km train trip from Kampala, Uganda, to Mombasa, Kenya can take from 14 to 21 days.³¹

While SSA roads are often inadequate, railways can present even more challenges to shippers, and in most SSA countries railways are losing market share to truck traffic. Due to low top speeds and unreliability on the narrow-gauge Kenyan railway, only 6 percent of the cargo entering and leaving Mombasa is now carried by train (down from 20 percent in 2006).³² Rail traffic in South Africa, which had a 9 percent freight market share in 2005 worth \$1.2 billion annually, has decreased over the last decade (except for coal and iron export lines), while road traffic has steadily increased.³³ Ghana has experienced a long and severe decline in rail traffic, and most of its goods (and all of its containers) now travel by truck, leaving manganese and bauxite (which can only feasibly be moved by rail due to their weight) to make up 83 percent of Ghana’s rail traffic.³⁴

The absence of high-quality rail lines also reduces competitive pressure and incentives for innovation and quality improvement in the trucking sector. This situation puts even more pressure on road use, increasing traffic and wear. Railways have suffered from continent-wide underinvestment in SSA, and even if countries reform their rail policies and make coordinated investments in regional rail networks, a critical mass of users has already shifted to roads. Some have invested in trucking fleets or otherwise made serious commitments to road use, and in such cases significant improvements in rail lines would be necessary to recapture this traffic.³⁵

Intermodal Transitions

Intermodal transitions (in which freight is transferred from trucks to trains, trains to ships, or other modal combinations) are particularly time consuming and inefficient throughout SSA; in many cases, intermodal links are the main bottleneck for freight movement. In 2003, Ghana’s freight forwarding industry was entirely reliant on manual loading and unloading for intermodal transitions.³⁶ Upgrading intermodal links is a priority in South Africa, where shippers are overusing the Johannesburg–Durban N3 road largely to avoid congested intermodal transfers required by rail shipments. Actual travel time from Durban to Johannesburg by train is estimated to be 18–21 hours (comparable to trucking

²⁸ Industry officials, interview by Commission staff, Mbabane, Swaziland, October 23, 2008. Some port management agencies or other authorities require that incoming trains meet minimum load thresholds before entering ports and unloading their freight, in order to ensure profitability. Swazi Railways has argued that it could bypass shunting yards in Kings Rest and Bayhead, South Africa and gain direct access to the Durban port if it could consistently achieve minimum train lengths of 20 railcars. Mpatia, Giersing, and Kaombwe, “Improving Transportation Logistics for Competitiveness of Swaziland,” April 2004, 18.

²⁹ Ford, “Investment, Not Rebranding, Is the Key,” December 2008.

³⁰ Industry officials, interview by Commission staff, Johannesburg, South Africa, October 15, 2008.

³¹ Faye, et al., “The Challenges Facing Landlocked Developing Countries,” March 2004, 48.

³² Industry official, interview by Commission staff, Mombasa, Kenya, October 27, 2008.

³³ Van der Muelen, “Transnet’s Turnaround Strategy,” September 2005. Converted from 11 billion rand, 2005 exchange rate.

³⁴ Pedersen, “Development of Freight Transport and Logistics,” 2003, 288.

³⁵ Industry officials, interview by Commission staff, Durban, South Africa, October 21, 2008.

³⁶ Pedersen, “Development of Freight Transport and Logistics,” 2003, 291.

time) but containers are not available for pickup at the City Deep container terminal in Johannesburg for an estimated seven days, as it reportedly takes three days to load a container onto a train and another three days to unload it.³⁷

Intermodal connections facilitate the vertical integration of commodity chains. Logistics sectors typically evolve from a three-stage system of transporting commodities (from rural hinterlands to marketplaces, from marketplaces to ports, and then from ports to overseas markets) to integrated door-to-door supply chains.³⁸ By comparison, improving intermodal links was a major factor in the export-driven development of Southeast Asian countries. Starting in the 1980s, these countries restructured their transport sectors into multimodal supply chain management sectors that took advantage of containerization and the internationalization of production.³⁹ Improvements in intermodal links in Southeast Asia were correlated with increased trade flows (especially of intermediate goods), increased integration into global production networks, and growth in domestic manufacturing sectors.

Service Providers

Ownership Structure

Some large manufacturing, mining, beverage, and agricultural firms in SSA maintain their own in-house shipping capacity to achieve self-sufficiency (such as the Magadi soda mine in Kenya, which operates its own railway lines).⁴⁰ Most producers, though, hire outside parties to transport their products, ranging from single owner-operator trucks to large third-party logistics providers (3PLs). The division of trucking ownership varies. In Ghana, the majority of the 10–11 percent annual growth in trucks since 1986 was driven by operator-owned trucks; only a few operators have large fleets.⁴¹ Owner-operator enterprises tend to be less efficient than large-scale 3PLs, but some countries maintain many owner-operators due to policies that promote entrepreneurship (such as poverty reduction plans that provide funding for small- to medium-sized enterprises).⁴² Larger operators have broader customer portfolios, more flexible operating conditions, and greater ability to back-haul cargo.⁴³ For example, Zambian operators with at least 50 trucks have a back-haul rate of almost 100 percent in spite of freight imbalances (partly due to high demand for transport services in the region).⁴⁴ Larger operators are also more able to enter into long-term contracts with producers, whereas many owner-operator transport services are purchased in truck (lorry) parks on spot markets.⁴⁵

The majority of SSA railways are operated by public or parastatal entities. Some parastatals operate effectively and independently; for example, South Africa's parastatal rail and port operator Transnet funds itself without receiving any general tax revenues and is using its earnings to fund a \$6.4 billion expansion plan.⁴⁶ However, many public

³⁷ Industry officials, interview by Commission staff, Durban, South Africa, October 21, 2008.

³⁸ Pedersen, "Freight Transport under Globalization," 2001, 96.

³⁹ *Ibid.*, 87.

⁴⁰ *Ibid.*, 96.

⁴¹ Pedersen, "Development of Freight Transport and Logistics," 2003, 290–91.

⁴² Pedersen, "Freight Transport under Globalization," 2001, 94.

⁴³ Back-haul refers to a vehicle carrying cargo on a return journey.

⁴⁴ Raballand, Kunaka, and Giersing, "The Impact of Regional Liberalization and Harmonization," January 2008, 5.

⁴⁵ Pedersen, "Development of Freight Transport and Logistics," 2003, 290–91.

⁴⁶ Industry officials, interview by Commission staff, Johannesburg, South Africa, October 15, 2008.

railway agencies in SSA constitute a combination of asset managers, operators, and regulators, which leads to problems stemming from self-regulation and makes it difficult for private operators to enter the market.⁴⁷ Nevertheless, some SSA railways are operated by private companies. The railway between Côte d'Ivoire and Burkina Faso was privatized in 1994 with major shipping companies and forwarders—SAGA, SDV, and Maersk—as the controlling shareholders.⁴⁸

Market Conditions

Although vehicle damage inflicted by poor-quality roads, high fuel costs, and the use of old fuel-inefficient truck fleets can make some operating costs in SSA's land transport sector higher than in other world regions according to the World Bank, lower wages and the lower capital costs of purchasing secondhand trucks can result in lower fixed costs.⁴⁹ (The median monthly wage for truckers in 2008 was \$160 in Zambia, \$189 in Chad, and \$269 in Kenya, compared to \$3,129 in France and \$3,937 in Germany.⁵⁰) By comparison, variable costs and fixed costs for operators in Central Africa are \$1.31 per km and \$0.57 per km respectively, whereas in France they are \$0.72 per km and \$0.87 per km.⁵¹ Costs also vary among SSA countries because of specific policies; for example, operators in Tanzania can afford better, more expensive vehicles or spend less acquiring similar vehicles than operators in Kenya, as Kenya imposes high import duties on vehicles while Tanzania exempts vehicles from import taxes.⁵² Similarly, South Africa prohibits the import of secondhand vehicles in order to benefit its domestic motor vehicle manufacturing industry, which imposes higher finance, depreciation, and insurance costs on truck owners.⁵³

From the standpoint of producers who hire shippers, transport costs take the form of prices charged by transport service providers. Although poor infrastructure raises variable costs in SSA, there should be a countervailing effect on transport prices from lower fixed costs. But in parts of SSA, particularly Central Africa, transport prices are higher than would be expected after accounting for this effect because land transport service providers are often able to mark up the prices of their services and maintain high price-cost margins.⁵⁴ This is partly because strong market regulations, such as fleet quotas and queuing systems for allocating freight, impose barriers for new entrants and provide opportunities for rent-seeking behavior on the part of truckers.⁵⁵

⁴⁷ Van der Muelen, "Transnet's Turnaround Strategy," September 2005.

⁴⁸ Pedersen, "Development of Freight Transport and Logistics," 2003, 287.

⁴⁹ Arvis, et al., "The Cost of Being Landlocked: Logistics Costs and Supply Chain Reliability," June 2007, 21. In this analysis, wages and the capital costs of trucks are considered fixed costs, and fuel and maintenance costs are considered variable costs.

⁵⁰ World Bank, cited in Portugal-Perez and Wilson, "Trade Costs in Africa," September 2008, 27.

⁵¹ Raballand and Macchi, "Transport Prices and Costs," September 27, 2008, 5.

⁵² Industry official, interview by Commission staff, Mombasa, Kenya, October 28, 2008.

⁵³ Raballand, Kunaka, and Giersing, "The Impact of Regional Liberalization and Harmonization," January 2008, 17.

⁵⁴ Raballand and Teravaninthorn, *Transport Prices and Costs in Africa*, 2009, 4.

⁵⁵ Queuing systems centralize and coordinate supply and demand for freight transport. In one illustrative system (the "tour de rôle"), all carriers register with a regional freight bureau, and anyone who needs freight transport submits their demands through brokers to the bureau. The bureau then allocates shipments to carriers, partly based on which carrier claims the freight first and partly pursuant to the goal of ensuring that even small shippers have opportunities to haul freight and are not shut out of the market. Such systems reduce incentives for shippers to become more competitive or provide better service because all carriers are entitled to transport at least some freight on a regular basis; they also facilitate corruption, as bribing the freight bureau is often the only way to increase business. Raballand and Macchi, "Transport Prices and Costs," September 27, 2008, 22.

Improvements in land transport infrastructure will not necessarily lower transport prices in regions where regulations render logistics markets uncompetitive; shipping firms capable of exercising monopolistic power may maintain high transport prices and avoid passing along savings to end-users. Market regulation is strong in West and Central Africa. In Central Africa especially, there are high barriers to market entry, and freight bureaus and transport associations have great influence, resulting in disproportionately high transport prices.⁵⁶ The result is that freight transport services in Central Africa can be more expensive than in developed countries. In the United States, freight transport prices average \$0.04 per ton-km, compared to \$0.11 per ton-km on the Douala, Cameroon–N’ djamena, Chad corridor.⁵⁷

Although the barriers to entry in West Africa are not as high as in Central Africa, many West African countries impose freight quotas, allocation schemes, and queuing systems, resulting in high cost, low-quality transport.⁵⁸ For example, in Burkina Faso, a regulation designed to protect domestic truck companies reserves two-thirds of all transit freight for carriage by Burkinabé trucks.⁵⁹ In Niger, where trucks are on average 29 years old, operating costs per vehicle-km are 30 percent higher than in Beninese and Togolese fleets, but shippers in Niger are required to use local fleets, resulting in higher prices, lower quality shipping services, and increased requests for informal payments (the trucking association in charge of enforcing quotas has reportedly sold market shares or freight to companies ready to offer the largest bribes).⁶⁰ Corruption in countries like Mali and Ghana reportedly also generates market inefficiencies.⁶¹ Compared to other SSA regions, East Africa has a less regulated and more competitive trucking environment, resulting in relatively low transport prices. Southern Africa, which has the least regulated trucking sector in SSA, has the lowest transport prices and highest transport efficiency among SSA regions.⁶²

The inefficiency of transport sectors can be seen in the annual distances driven by trucks. Operators in some developed countries drive around 121,000 km per year, whereas operators in East Africa drive 100,000 km per year, and operators in Central Africa drive only 65,000 km per year.⁶³ This difference is attributed partly to strong market regulations and partly to heavy reliance on poorly maintained trucks that are often sidelined for repair.⁶⁴ The profit margins on different SSA corridors are correlated with the level of truck utilization (which reflects cartel systems that keep inefficient trucking firms operating).⁶⁵ For example, southern Africa uses vehicles at a rate of 10,000 to 12,000 km per month (similar to Europe), and operators on the Lusaka, Zambia–Johannesburg, South Africa corridor have a profit margin of about 18 percent; conversely, Central and West African countries, which have trucking cartels, use vehicles at 2,000 km per month, and the profit margin on the Ngaundere, Cameroon–Moundou, Chad corridor (which is shorter than the Lusaka-Johannesburg corridor) is about 163

⁵⁶ Arvis, et al., “The Cost of Being Landlocked: Logistics Costs and Supply Chain Reliability,” June 2007, 68.

⁵⁷ Raballand and Macchi, “Transport Prices and Costs,” September 27, 2008, 4.

⁵⁸ Arvis, et al., “The Cost of Being Landlocked: Logistics Costs and Supply Chain Reliability,” June 2007, 22.

⁵⁹ Faye, et al., “The Challenges Facing Landlocked Developing Countries,” March 2004, 48.

⁶⁰ Raballand and Teravaninthorn, *Transport Prices and Costs in Africa*, 2009, 53.

⁶¹ Pedersen, “Development of Freight Transport and Logistics,” 2003, 291.

⁶² Portugal-Perez and Wilson, “Trade Costs in Africa,” September 2008, 11.

⁶³ Raballand and Macchi, “Transport Prices and Costs,” September 27, 2008, 5.

⁶⁴ *Ibid.*, 9.

⁶⁵ Raballand and Teravaninthorn, *Transport Prices and Costs in Africa*, 2009, 55.

percent.⁶⁶ Average trucking rates in SSA declined during the 1990s, but rates are still high for the quality of service provided.

Soft Infrastructure: Borders

In many SSA corridors, the harshest constraints on improving transport time are administrative procedures at borders. On the Northern Corridor, trucks reportedly lose up to four hours of travel time on some corridor segments due to road conditions, but often lose more than one day at Malaba, the Uganda–Kenya border post.⁶⁷ One study found that trucks carrying imports into Rwanda waited an average of two days at Malaba and one day at Gotuma (the Uganda–Rwanda border post).⁶⁸ Casa Gulu, the Zambia–Botswana bridge link, regularly has queues up to 3 or 4 km long.⁶⁹ In 2004, a truck required an average of between three weeks to a month to travel 985 km from Bangui, CAR, to Douala, Cameroon, with CAR–Cameroon border procedures taking up to two weeks.⁷⁰ The Maputo port in Mozambique would be a logical source of imports and destination for exports for industries in South Africa’s Gauteng province (which includes the city of Johannesburg) because it is much closer than ports in Durban or Cape Town, but industry officials indicate that crossing the South Africa–Mozambique border introduces so much cost and uncertainty that the majority of Gauteng businesses rely on the port in Durban.⁷¹ Administrative procedures and delays at borders account for an estimated 20 percent of freight costs in East Africa, and delays at southern African border posts cost an estimated \$48 million in 2001 (about 0.1 percent of the value of southern African exports that year).⁷²

Government agencies that operate at borders include customs, immigration, agriculture, and health ministries. Among global regions, SSA has the highest number of export procedures and the second-highest number of import procedures.⁷³ There are 15 government agencies enforcing duplicative laws on either side of the Chirundu Border Post (the main gateway for commercial traffic between Zambia and Zimbabwe), resulting in average border crossing times ranging from 26 to 46 hours northbound into Zambia, and from 6 to 17 hours southbound into Zimbabwe.⁷⁴ The administrative costs of crossing borders include documentation time and fees, customs clearance fees, and terminal handling charges. A Mozambican company entering Zimbabwe must pay a road-user charge of \$25 per 100 km, an entry visa charge of \$30, an insurance charge of \$300 for three months, a carbon tax of \$30 for one month, and a guarantee of \$120 per year.⁷⁵ The World Bank’s Doing Business Online Database indicates that, measured as absolute fees levied on a 20-foot container, SSA has the highest average costs for both export and import procedures of any world region, roughly twice as high as in high-income countries (figure 1.1 in chapter 1).⁷⁶ One factor that increases complexity in border crossing procedures is the desire of transit countries to secure revenues from tariff duties.⁷⁷

⁶⁶ Ibid., 40.

⁶⁷ Raballand and Macchi, “Transport Prices and Costs,” September 27, 2008, 12.

⁶⁸ Subramanian, “Building Competitive Trade Logistics for Global Markets,” May 5, 2008.

⁶⁹ Industry officials, interview by Commission staff, Durban, South Africa, October 21, 2008.

⁷⁰ Faye, et al., “The Challenges Facing Landlocked Developing Countries,” March 2004, 48.

⁷¹ Industry officials, interview by Commission staff, Johannesburg, South Africa, October 24, 2008.

⁷² Faye, et al., “The Challenges Facing Landlocked Developing Countries,” March 2004, 48–57.

⁷³ Portugal-Perez and Wilson, “Trade Costs in Africa,” September 2008, 6.

⁷⁴ Department for International Development, “Modern and Efficient Border Controls,” February 19–29, 2008.

⁷⁵ Raballand and Teravaninthorn, *Transport Prices and Costs in Africa*, 2009, 71.

⁷⁶ Portugal-Perez and Wilson, “Trade Costs in Africa,” September 2008, 7.

⁷⁷ Raballand, “The Cost of Being Landlocked in Africa,” February 21, 2008.

Multiple-clearance transit systems are vulnerable to various types of rent-seeking behaviors, such as demands for bribes from customs or military officials.⁷⁸

Border-crossing costs are multiplied by information barriers. Customs organizations may fail to communicate changes regarding border-crossing procedures to shipping firms (whose vehicles may arrive at borders without the newly required documents and face unrecoverable penalties) or to neighboring countries.⁷⁹ Private-sector operators also contribute to border delays when they fail to acquire and provide the necessary documentation even after receiving notice of changes. Additionally, language barriers sometimes cause friction for drivers crossing borders.

Limited days of operation and business hours at border crossings also affect freight flows. In 2004, the two main corridors for Burkina Faso had customs escorts only three times per week.⁸⁰ Kenyan President Mwai Kibaki recently mandated that several border posts, as well as the Mombasa port, provide service 24 hours per day (some borders had only been open for 8 hours per day) in order to reduce freight congestion and encourage trade.⁸¹ The Ressano Garcia border post between Mozambique and South Africa has proposed expanding daily cargo clearance hours from 16 to 24 as part of a coordinated effort to attract South African freight traffic to Maputo.⁸²

Some border posts also have problems with their physical design. At Golela (a Swaziland–South Africa border post), drivers sometimes enter the building to make a declaration and emerge to find their path blocked by another truck.⁸³ At Malaba (on the Kenya–Uganda border) there is limited parking space for trucks and limited space in the customs yard, and customs officials start to process documents (which can take several hours) only after trucks have entered the customs yard.⁸⁴

Effects of Land Transport Infrastructure Conditions on Export Competitiveness

Effects on International Trade

Inadequate land transport infrastructure has a number of effects on SSA trade, including increased costs and uncertainty, reduced investment in exporting industries, and lower levels of export volume and diversity. Export competitiveness in SSA countries is partly constrained by geographic distance. The main markets for most SSA exports are the United States and the EU, several thousand km away from major SSA economic centers, and many products must travel long distances just to reach ports (for example, Kigali, Rwanda, is 1,670 km from the port in Mombasa, Kenya). Generally, areas in SSA closer to ports have more skill-intensive sectors and are more integrated into global markets, with export diversity declining as distance from ports increases.⁸⁵ For example, South

⁷⁸ Ibid.

⁷⁹ Industry officials, interview by Commission staff, Durban, South Africa, October 21, 2008.

⁸⁰ Faye, et al., “The Challenges Facing Landlocked Developing Countries,” March 2004, 48.

⁸¹ Agina and Beja, “Kibaki Orders 24-hour Service at Mombasa Port,” August 12, 2008.

⁸² Industry officials, interview by Commission staff, Johannesburg, South Africa, October 24, 2008.

⁸³ Industry official, interview by Commission staff, Mbabane, Swaziland, October 22, 2008.

⁸⁴ Raballand and Teravaninthorn, *Transport Prices and Costs in Africa*, 2009, 79.

⁸⁵ Naudé and Matthee, “The Significance of Transport Costs in Africa,” 2007.

African regions farthest away from ports produce more furniture, textiles, and metal products, which are primarily for domestic markets.⁸⁶ The importance of distance to port for exporters is also made apparent by tracing 2003 export-to-GDP ratios for countries along the Northern Corridor that ends at Kenya's Mombasa port: 6 percent for Burundi, 9 percent for Rwanda, 12 percent for Uganda, and 26 percent for Kenya.⁸⁷

In SSA, transport costs as a percentage of export and import values are very high. Transport costs in Zambia account for up to 17 percent of total import costs, more than three times as much as in developed countries.⁸⁸ These costs are generally higher than for non-SSA developing countries, and (as context for trade-inhibiting effects) they are much higher than average importing-country tariffs on SSA exports.⁸⁹ Globally, liberalization has reduced many tariffs and other artificial trade barriers encountered by SSA exports, which increases the relative constraining power of transport costs.⁹⁰

These high transport costs greatly reduce trade potential. One study from 2000 estimated that a doubling of transport costs can reduce trade flows by as much as 80 percent and can reduce import values by roughly the same amount.⁹¹ The study also found that land distance generally has a much stronger effect on total transport costs than sea distance, and estimated that an extra 1,000 km distance traveled by sea adds an average of \$190 to the final transport cost of a standard container, whereas an extra 1,000 km traveled by land adds an average of \$1,380.⁹² In addition, products exported by SSA countries tend to be primary commodities such as minerals or agricultural products which are typically bulky, heavy, often noncontainerized, hard to transport, and unprocessed, thus having high transport costs relative to value. (Diamonds and some beadwork are exceptions.) Competitive international markets make it difficult for SSA exporters to pass these high transport costs on to buyers.

Trade with countries outside SSA is particularly difficult for landlocked SSA countries, which depend on other countries' ports, land transport networks, political stability, and administrative practices. Neighboring countries in SSA sometimes have disputes and conflicts, produce the same exports and compete for international markets, or have internal problems that affect passage of transit goods. The infrastructure of SSA countries with coastal access is a regional public good (that is, it has positive externalities and should create opportunities for welfare-enhancing collective action) and tends to be undersupplied. Studies have found that being landlocked raises total transport costs by

⁸⁶ Ibid.

⁸⁷ Faye, et al., "The Challenges Facing Landlocked Developing Countries," March 2004, 57. GDP per capita in these countries is also progressively higher the closer they are to the port of Mombasa which, like the export-to-GDP ratio, may be due to a number of factors, but reflects the endogeneity between development levels and infrastructure conditions.

⁸⁸ Raballand, Kunaka, and Giersing, "The Impact of Regional Liberalization and Harmonization," January 2008, 2.

⁸⁹ World Bank, *Can Africa Claim the 21st Century?* 2000, 138.

⁹⁰ See Amjadi and Yeats, "Have Transport Costs Contributed to the Relative Decline of African Exports?" December 1995. This study found that the average ad valorem transport cost for SSA exports was 8.7 percent, whereas the average tariff on these goods was 0.5 percent. It also found the ratio of net freight and insurance payments to the value of SSA exports to be 15.1 percent, much higher than in other regions (the average for all developing countries was 5.8 percent). This percentage had actually increased over time for SSA, while decreasing in other regions (in developing countries in Asia, it dropped from 8 percent to 0 percent between 1970 and 1990, meaning Asian countries were receiving as many freight and insurance payments as they were making). The purchasing of freight and insurance services from other countries uses foreign exchange that might otherwise go into capacity-building investments.

⁹¹ Limão and Venables, "Infrastructure, Geographical Disadvantage and Transport Costs," 2001, 2.

⁹² Ibid., 5.

about 50 percent, with the median landlocked economy having only 30 percent of the trade volume of the median coastal economy.⁹³ One study found that net freight payments averaged 42 percent of the annual value of exports for landlocked SSA countries, compared with an average of 18 percent for SSA countries with coastal access.⁹⁴ Swaziland and Botswana, however, have been able to overcome problems associated with being landlocked; the former is close to ports in Mozambique and South Africa, the latter relies on diamonds (84 percent of its exports by value), which can be profitably transported by air, and both benefit from being integrated into southern Africa's good road network and having access to multiple corridors.⁹⁵

Effects on Intra-SSA Trade

There are intra-regional trade opportunities within SSA, especially for countries that share a border. Neighboring countries often have integrated transport networks and in many instances have bilateral transit or customs agreements. However, the poor quality and overall port-oriented design of land transport infrastructure in SSA inhibits intra-regional trade. One study found the median transport costs for intra-SSA trade to be about the same as for SSA imports from the rest of the world and much higher than (i.e., equal to the 75th percentile of) the average cost of intra-regional trade in other geographic regions.⁹⁶ The study also found that intra-regional trade as a percentage of total trade in SSA averaged only 4 percent, compared to 44 percent in East Asia.⁹⁷ There is no overland trade between South Africa and Nigeria, the two largest economies in SSA.

Improved road and rail links may increase trade between SSA countries by integrating markets and facilitating specialization, analogous to the effects of the U.S. rail and interstate highway systems. However, the intra-SSA trade effects are limited by the fact that many SSA countries produce similar commodities (agriculture and minerals), while demand for imports tends to be for manufactured goods.⁹⁸ There is limited complementarity between regional economies in SSA, and in the absence of changes in the trade profiles of SSA countries, there may be little natural momentum behind changes in infrastructure.⁹⁹ However, countries with manufacturing sectors (like South Africa and Kenya) could expect to benefit from improved land transport links. Moreover, there may be a tipping point in intra-regional trade flows such that coordinated interventions in infrastructure, political institutions, education, and other complementary sectors in multiple countries could create momentum toward the unification of markets and generate significant growth in regional trade.

⁹³ Limão and Venables, "Infrastructure, Geographical Disadvantage and Transport Costs," 2001, 17.

⁹⁴ Amjadi and Yeats, "Have Transport Costs Contributed to the Relative Decline of African Exports?" December 1995, 7.

⁹⁵ Faye, et al., "The Challenges Facing Landlocked Developing Countries," March 2004, 39.

⁹⁶ Limão and Venables, "Infrastructure, Geographical Disadvantage and Transport Costs," 2001, 20.

⁹⁷ Ibid., 20.

⁹⁸ In fact, many primary commodities are exported from SSA, processed, and then returned to SSA for consumption. Khandelwal, "COMESA and SADC," December 2004, 15.

⁹⁹ Khandelwal, "COMESA and SADC," December 2004, 17.

Efforts to Improve the Land Transport Sector

Reforms

Management reforms are vital for improving infrastructure in SSA. Agencies that manage land transport infrastructure are responsible for prioritizing and sequencing investments, establishing standards and legal frameworks, and agreeing on cost-recovery principles. But the operation and maintenance of land transport infrastructure in SSA (most of which is owned, financed, and managed by governments) can be impaired by poorly designed management organizations in which lines of responsibility are unclear and budgetary authority is not aligned with performance objectives.¹⁰⁰ Many SSA countries face fragmented planning efforts, as responsibility for infrastructure is seldom concentrated in a single government department. In South Africa, Transnet (the parastatal rail and port operator) is accountable to the Department of Public Entities, but the Department of Transport drafts transportation policy. Moreover, trade policy (which is closely linked to transport policy) falls under the purview of the Department of Trade and Industry, and the South African Revenue Service, which includes South Africa's customs agency, is part of the National Treasury, which has budgetary authority over public infrastructure investments.¹⁰¹ It is difficult to create and implement national transport strategies when decisions about infrastructure investments are spread among multiple agencies.

Many SSA countries are implementing organizational reforms (such as increased delegation, accountability, and use of nongovernmental agencies) to ensure that their land transport infrastructure investments are coordinated and reflect national priorities. In 1996, the Ugandan government developed a 10-year Road Sector Development Plan that provided a strategic and administrative roadmap for the transformation of the role of government from direct provider of transport services to provider of policy guidance and legal frameworks.¹⁰² As a result of the plan, the percentage of "fair or good" national roads increased from 50 percent in 1990 to 70 percent in 1999.¹⁰³ Generally, management reforms in SSA have had some success encouraging investment in land transport infrastructure and improving coordination on national and cross-border projects.¹⁰⁴

Oversight of infrastructure financing is often limited, and user fees, to the extent collected, are often commingled with other government revenues. Construction and maintenance funds in SSA countries are not always managed by independent boards that provide adequate oversight; many funds are audited only infrequently,¹⁰⁵ and governments tend to borrow from these funds for other purposes.¹⁰⁶ SSA countries often finance infrastructure partly through user fees such as fuel levies or vehicle license fees, however, some SSA countries have low collection rates on user charges. Fees often are only raised in response to donor pressure. This financing model is considered to be

¹⁰⁰ Nyangaga, "Reforming Road Management," March 2001, 2.

¹⁰¹ Industry officials, interview by Commission staff, Durban, South Africa, October 21, 2008.

¹⁰² Kumar, "A Contrasting Approach to Road Reforms," March 2002, ix. The plan separated planning and financing responsibilities from procurement and implementation offices; commercialized technical and engineering services; and established the clear definition, separation, and assignment of road responsibilities, with matching authority and performance targets (including financial audits).

¹⁰³ *Ibid.*, 10.

¹⁰⁴ Africa Partnership Forum, "Interim Document Set: 9th Meeting of the Africa Partnership Forum," November 12–13, 2007, 69.

¹⁰⁵ Brushett, "Management and Financing of Road Transport Infrastructure in Africa," March 2005, 7.

¹⁰⁶ Kumar, "A Contrasting Approach to Road Reforms," March 2002, 18.

effective inasmuch as it ensures actual road users are paying for road maintenance.¹⁰⁷ Many countries, however, put user fees into a general pool of tax revenues overseen by their treasuries, in which case there is no dedicated revenue stream for land transport that can be used for maintenance and new investment expenses.¹⁰⁸ This commingling of funds makes it more difficult to align revenues with expenditures.

Private firms are generally willing to enter infrastructure markets (table 3.2) when the regulatory environment is supportive and forecasted revenues are sufficiently high. South Africa granted a concession for its N4 national road in 1997 to Trans Africa Concessioning, which now charges tolls. In 2003, Nigeria decided to develop a toll road corridor along the Lekki peninsula with a 30-year concession to Lekki Concession Co. Ltd. (the first private toll road concession in West Africa).¹⁰⁹ Private concessionaires face challenges: operators often test new concession laws (and the government's commitment to the project) and operate in difficult urban construction and tolling environments. They also have to borrow either in domestic capital markets that normally do not provide long-term, limited-recourse funding (that is, funding in which borrowers generally have no liability to repay debt except from the earnings of the project) or in international markets, which creates exchange-rate risk (as debts are usually in U.S. dollars and revenue streams are in local currencies).¹¹⁰

In addition to management and finance reforms, technology can facilitate trade and transport. Some customs authorities have streamlined their contraband-focused procedures by using efficient container scanners, electronic data interchanges, and risk management software; container seals and satellite-based electronic tracking systems provide pre-border customs clearance at some inland ports and export-producing factories.¹¹¹ Some countries let companies provide online declarations or allow clearing agents to e-mail truck manifests, which customs agents can examine when the truck reaches the border. For example, Uganda recently linked its online declaration system with Kenya's.¹¹²

Investment

In most SSA countries investment has not been sufficient to maintain existing land transport infrastructure or expand it to meet increased needs. The current infrastructure funding gap in SSA is estimated to be \$35 billion.¹¹³ In 2000, the World Bank estimated that infrastructure maintenance in SSA would require about 5–6 percent of GDP annually, but many SSA countries consistently fell short of this target.¹¹⁴ Even those that achieve this target may struggle to meet infrastructure demands; Tanzania spent about 6 percent of its GDP annually on infrastructure between 2000 and 2004, but this was equivalent to \$27 per person, less than one-tenth the average per capita spending levels in middle-income countries over the same period.¹¹⁵ Historically, SSA countries have allocated as little as 20 percent of what was necessary for road maintenance, and even

¹⁰⁷ Nyangaga, "Reforming Road Management," March 2001, 3.

¹⁰⁸ Industry officials, interview by Commission staff, Johannesburg, South Africa, October 15, 2008.

¹⁰⁹ Wood, "Road to New Market," September 2008.

¹¹⁰ Ibid.

¹¹¹ Industry officials, interview by Commission staff, Mbabane, Swaziland, October 23, 2008.

¹¹² World Bank, *Doing Business 2008*, 2007, 45.

¹¹³ Foster, "Overhauling the Engine of Growth," September 2008, 13.

¹¹⁴ World Bank, *Can Africa Claim the 21st Century?* 2000, 142.

¹¹⁵ Ter-Minassian, Hughes, and Hajdenberg, "Creating Sustainable Fiscal Space for Infrastructure," November 2008, 9.

TABLE 3.2 Select land transport infrastructure projects with private participation in sub-Saharan Africa

Project name	Countries affected	Participating company	Type of participation	Private investment commitment (million \$)
Abidjan Lagoon Toll Bridge	Côte d'Ivoire	Société Concessionnaire du Pont Riviera (Socoprim)	Greenfield project (30 yrs)	150.0
Abidjan-Ouagadougou Railway	Burkina Faso, Côte d'Ivoire	Sitarail	Concession (20 yrs)	63.3
Bakwena Platinum Toll Highway	South Africa	Bakwena Platinum Corridor	Greenfield project (30 yrs)	450.0
Beira Railway	Mozambique	Companhia Dos Caminhos De Ferro Da Beira	Concession (25 yrs)	152.5
Beitbridge-Bulawayo Railway	Zimbabwe	Beitbridge-Bulawayo Railway Private Limited	Greenfield project (30 yrs)	85.0
Cameroon Railways	Cameroon	Camrail	Concession (30 yrs)	90.0
Central Railway	Nigeria	Global Infrastructure Nigeria Limited	Concession (20 yrs)	^(a)
Chapman's Peak Drive	South Africa	Entabeni Limited	Concession (30 yrs)	17.0
Dakar-Bamako Railway	Mali, Senegal	Canac-Getma Consortium	Concession (25 yrs)	55.4
Gautrain Light Rail	South Africa	Bombela Consortium	Greenfield project (20 yrs)	3,483.0
Kenya-Uganda Railways	Kenya, Uganda	Rift Valley Railways	Concession (25 yrs)	400.0
Limpopo Toll Bridge	Zimbabwe	Beitbridge-Bulawayo Railway Private Limited	Greenfield project (20 yrs)	18.0
Malagasy Railway	Madagascar	Malagasy Railway	Concession (20 yrs)	36.0
Malawi-Nacala Railway	Malawi	Central East African Railway Company	Management and lease (20 yrs)	6.0
Maputo Corridor Railway	Mozambique	Spoornet (Transnet)	Concession (15 yrs)	10.0
N3 Toll Road	South Africa	N3 Toll Road Consortium	Concession (30 yrs)	570.0
N4 Toll Road	Mozambique, South Africa	Trans Africa Concessions	Concession (30 yrs)	426.0
Nacala Corridor Railway	Mozambique	Corredor de Desenvolvimento do Norte	Concession (15 yrs)	17.7
Trans-Gabonese Railroad Concession (II)	Gabon	Setrag	Concession (30 yrs)	91.8
Zambia Railways	Zambia	Railway Systems of Zambia Limited	Concession (20 yrs)	14.8

Source: World Bank, PPIAF, Private Participation in Infrastructure Database, updated October 2008.

^aNot available.

that allocation has been subject to postponements or cuts without warning.¹¹⁶ The economic gains of land transport infrastructure investments are region specific and depend upon traffic volumes—for example, the biggest returns on road rehabilitation may be along East African corridors, which tend to have higher minimal traffic levels (at least 200 trucks per day) than West or Central African corridors¹¹⁷—but virtually all SSA countries stand to benefit from closing infrastructure financing gaps.

Attempts to increase investment continue to face substantial hurdles. For example, countries need to access credit on international capital markets to pay for infrastructure investments, which will likely be difficult for SSA countries in the upcoming years, particularly in light of recent developments in world financial markets. Kenya recently had to suspend some major infrastructure projects because the government could not generate funding through a \$300-million sovereign bond issue; foreign investors were demanding high-interest premiums given risk perceptions linked to the current global financial downturn.¹¹⁸

International donors have historically been a major source of infrastructure investment in SSA. For example, in 2006 members of the Infrastructure Consortium for Africa (which coordinates international development assistance) invested \$3.2 billion in transport projects in SSA, up from \$2.6 billion in 2005.¹¹⁹ Some donors are reluctant, however, to fund certain aspects or types of infrastructure. For example, many want developing-country governments to meet recurring costs such as administration and maintenance. Additionally, reliance on international donors leads to fluctuating infrastructure investment depending on when donors provide funds.¹²⁰

In addition to traditional providers of infrastructure financing, China has recently played a growing role in infrastructure upgrading projects in SSA. The China Export-Import Bank is financing land transport projects in more than 35 SSA countries, with Nigeria, Angola, Sudan, and Ethiopia as the largest recipients.¹²¹ Chinese financial commitments to SSA infrastructure projects rose from \$1 billion per year in 2001–03 to \$7 billion in 2006 (the Chinese “Year of Africa”), and then fell back to \$4.5 billion in 2007.¹²² The majority was invested in railroads. Much of this financing is through an “Angola mode” arrangement, in which the beneficiary SSA country awards a license to extract natural resources to a Chinese company, and selects a Chinese infrastructure contractor to construct infrastructure; the China Export-Import Bank then accepts the license as payment in kind for a loan that it provides directly to the contractor.¹²³ Chinese

¹¹⁶ Nyangaga, “Reforming Road Management in Sub-Saharan Africa,” March 2001, 3.

¹¹⁷ Raballand and Macchi, “Transport Prices and Costs,” September 27, 2008, 13.

¹¹⁸ Anyanzwa, “State Suspends Major Infrastructure Projects,” December 5, 2008.

¹¹⁹ In April 2008, a number of U.S. government agencies including the Department of Transportation, USTR, and the Millennium Challenge Corporation hosted a conference in South Africa bringing together U.S. and African government officials, as well as representatives of the private sector and multilateral organizations. The conference announced the establishment of a number of important initiatives including the African Trade Lanes Partnership, in which the U.S. government will provide financing for a number of trade-facilitating transportation projects within SSA. USTDA, “Remarks of Larry Walther,” April 14, 2008; Biau, Dahou, and Homma, “How to Increase Sound Private Investment,” December 11, 2008, 4.

¹²⁰ Simuyemba, “Linking Africa Through Regional Infrastructure,” 2000, 12; Nyangaga, “Reforming Road Management,” March 2001, 11.

¹²¹ Foster, et al., “Building Bridges,” 2008, vi.

¹²² *Ibid.*, vii.

¹²³ *Ibid.*, 43.

infrastructure financing is generally not linked to governance and accountability requirements.¹²⁴

Regional Cooperation

SSA countries have sought to improve the predictability and speed of cross-border land transport by promoting bilateral relationships between transport ministries, adopting multilateral standards and accreditations (such as international licenses), and forming regional organizations that share information. For example, the South African Revenue Service handles many import procedures for the Southern African Customs Union (SACU) member countries.¹²⁵ The Southern African Development Community (SADC) issues regional drivers' licenses and aims to harmonize tariffs by 2010.¹²⁶ The Common Market for Eastern and Southern Africa (COMESA) has harmonized road transit charges, established a common carriers license, and implemented a Yellow Card program that guarantees third-party insurance across borders.¹²⁷ Regional organizations like the Economic Community of West African States (ECOWAS) are discussing multilateral rail protocols, including commitments that all new rail lines be of a common gauge.¹²⁸

International organizations are facilitating regional partnerships as well. The East African Trade and Transport Facilitation Project (TTFP), funded by the World Bank and African Development Fund, aims to strengthen the Northern Corridor Transit Transport Coordinating Authority (a catalyst for regional trade), develop protocols for the East African Community customs union, establish a regional electronic cargo tracking system, and support the joint concessioning of the Kenya–Uganda railways.¹²⁹ Similarly, the Economic and Monetary Community of Central Africa (CEMAC) promotes enforcement of load controls and investment in roads and railways along Central African corridors—for example, paving roads in Cameroon, promoting output-based performance contracts in Chad, and designing a public-private partnership for Cameroon Railways.¹³⁰ These

¹²⁴ *Ibid.*, vii.

¹²⁵ Industry official, interview by Commission staff, Mbabane, Swaziland, October 22, 2008. Customs duties collected by the five member countries are pooled, then distributed according to a formula kept secret by South Africa's treasury.

¹²⁶ Faye, et al., "The Challenges Facing Landlocked Developing Countries," March 2004, 55.

¹²⁷ *Ibid.*, 55.

¹²⁸ Most SSA rail systems rely on interchanges at borders where containers are transferred from one wagon to another. Goods traveling by train from the DRC to South Africa can only be moved by DRC operators to the Zambian border, where Zambian operators take over; then Zimbabwean operators take over at Victoria Falls, etc. The need for interchanges results from national policies, physical differences in rail gauge, and other conditions (such as the limited ability in some countries to repair other countries' rolling stock) that inhibit cross-border trade in rail services. Interchanges are often poorly facilitated and require waiting times of up to 8 hours. Industry officials, interview by Commission staff, Mbabane, Swaziland, October 23, 2008; UNECA, "Assessment of Progress on Regional Integration in Africa," October 8–10, 2007, 2.

¹²⁹ In addition, in March 2009, the East African Community (EAC) announced plans to launch a major infrastructure initiative that will bring together members of the Common Market for Eastern and Southern Africa (COMESA), the EAC and the Southern African Development Community (SADC). The initiative seeks, through an integrated series of projects, to upgrade infrastructure, simplify customs and regulatory procedures, and improve power supply and transmission in the 12 Southern African Power Pool members. The initiative hopes to secure infrastructure investment funding from multilateral organizations, development agencies, and the private sector. EAC, "Major New Infrastructure Initiative," March 25, 2009. African Development Fund, "East Africa Trade and Transport Facilitation Project," October 2006, xi.

¹³⁰ Marteau and Raballand, "Support to Effectiveness of Regional Transit," February 21, 2008. The largest impact of CEMAC's plan—more than 70 percent of the total projected benefits—is projected to fall on Cameroon, where there are higher traffic volumes.

partnerships are part of a broader effort to establish and strengthen regional partnerships that integrate economies and promote stability and growth in SSA.

Bibliography

- Adzibgey, Yao, Charles Kunaka, and Tesfamichael Nahusenay Mitiku. "Institutional Arrangements for Transport Corridor Management in Sub-Saharan Africa." World Bank SSATP Working Paper no. 86, October 2007.
- African Development Fund. "East Africa Trade and Transport Facilitation Project: Appraisal Report." African Development Bank Group, October 2006.
- Africa Partnership Forum. "Interim Document Set: 9th Meeting of the Africa Partnership Forum." Algiers, Algeria, November 12–13, 2007.
- Agina, Ben, and Patrick Beja. "Kibaki Orders 24-hour Service at Mombasa Port." *East Africa Standard*, August 12, 2008.
- Amjadi, Azita, and Alexander Yeats. "Have Transport Costs Contributed to the Relative Decline of African Exports? Some Preliminary Empirical Evidence." World Bank International Trade Division. Policy Research Working Paper no. 1559, December 1995.
- Anyanzwa, James. "State Suspends Major Infrastructure Projects." *East African Standard*, December 5 2008.
- Arvis, Jean-François, Raballand, Gaël, and Marteau, Jean-François. "The Cost of Being Landlocked: Logistics Costs and Supply Chain Reliability." World Bank Policy Research Working Paper no. 4258, June 2007.
- Biau, Carole, Karim Dahou, and Toru Homma. "How to Increase Sound Private Investment in Africa's Road Infrastructure: Building on Country Successes and OECD Policy Tools." NEPAD-OECD Africa Investment Initiative Expert Roundtable on Investment in Transport Infrastructure, Kampala, Uganda, December 11, 2008.
- Brushett, Stephen. "Management and Financing of Road Transport Infrastructure in Africa." World Bank SSATP Discussion Paper no. 4, March 2005.
- Buys, Piet, Uwe Deichmann, and David Wheeler. "Road Network Upgrading and Overland Trade Expansion in Sub-Saharan Africa." World Bank Development Research Group. Policy Research Working Paper no. 4097, December 2006.
- Calderon, Cesar, and Luis Servén. "Infrastructure and Economic Development in Sub-Saharan Africa." World Bank Development Research Group. Policy Research Working Paper no. 4712, September 2008.
- Degerlund, Jane, ed. *Containerization International Yearbook, 2008*. London: Lloyd's MIU, 2008.
- De Jong, Robert C. "South Africa: Railway Heritage At Risk." International Council of Monuments and Sites, 2002. <http://www.international.icomos.org/risk/2002/southafrica2002.htm>.
- Department for International Development. "Modern and Efficient Border Controls: Theory of One Stop Border Posts (OSBP); Lessons Learnt on the Chirundu OSBP Project." Presented at the World Bank Sustainable Development Network Week, Washington, DC, February 19–29, 2008.

- Dierks, Klaus. "A Case for Namibian Roads Conservation: Agenda for Reform." Namibia Ministry of Works, Transport and Communication Position Paper, December 28, 2000.
- East African Community (EAC). "Major New Infrastructure Initiative to Transform Southern and Eastern African Trading Opportunities." Press release, March 26, 2009.
- Economist*. "The Road to Hell is Unpaved," December 19, 2002.
- Faye, Michael, John W. McArthur, Jeffrey D. Sachs, and Thomas Snow. "The Challenges Facing Landlocked Developing Countries." *Journal of Human Development* 5, no. 1 (March 2004): 31–68.
- Ford, Neil. "Investment, Not Rebranding, Is the Key." *African Business*, December 2008.
- Foster, Vivien. "Overhauling the Engine of Growth: Infrastructure in Africa." Africa Infrastructure Country Diagnostic, September 2008.
- Foster, Vivien, William Butterfield, Chuan Chen, and Nataliya Pushak. "Building Bridges: China's Growing Role as Infrastructure Financier for Africa." World Bank Public-Private Infrastructure Advisory Facility, 2008.
- Hertel, Thomas, Terrie Walmsley, and Ken Itakura. "Dynamic Effect of the 'New Age' Free Trade Agreement between Japan and Singapore." *Journal of Economic Integration* 16, no. 4 (December 2001): 446–84.
- Khandelwal, Padamja. "COMESA and SADC: Prospects and Challenges for Regional Trade Integration." IMF Working Paper WP/04/227, December 2004.
- Kumar, Ajay. "A Contrasting Approach to Road Reforms: The Case Study of Uganda Experience." World Bank SSATP Discussion Paper no. 1, March 2002.
- Limão, Nuno, and Anthony J. Venables. "Infrastructure, Geographical Disadvantage and Transport Costs." *World Bank Economic Review* 15, no. 3 (2001): 451–79.
- Marteau, Jean-François, and Gaël Raballand. "Support to Effectiveness of Regional Transit." Presented at the World Bank Sustainable Development Network Week, Washington, DC, February 21, 2008.
- Mpata, Stallard, Bo Giersing, and Smak Kaombwe. "Improving Transportation Logistics for Competitiveness of Swaziland." Prepared by Chemonics International, Inc., for U.S. Agency for International Development, Regional Center for Southern Africa. Gaborone, Botswana, April 2004.
- Naudé, Wim, and Marianne Mathee. "The Significance of Transport Costs in Africa." United Nations University World Institute for Development Economics Research. Policy Brief no. 5, 2007.
- Nyangaga, Francis. "Reforming Road Management in Sub-Saharan Africa." World Bank SSATP Technical Note 32, March 2001.
- Organisation for Economic Co-Operation and Development (OECD). *Africa Economic Outlook 2007/2008*. Paris, France: OECD, 2008.

- Pearson, Mark. "The North-South Corridor: An Aid for Trade Initiative." Presented at Regional Trade Facilitation Programme Meeting of Stakeholders, Washington, DC, October 11, 2008.
- Pedersen, Poul O. "Development of Freight Transport and Logistics in SSA: Taaffe, Morrill and Gould Revisited." *Transport Reviews* 23, no. 3 (2003): 275–97.
- . "Freight Transport under Globalization and its Impact on Africa." *Journal of Transport Geography* 9, (2001): 85–99.
- Portugal-Perez, Alberto, and John S. Wilson. "Trade Costs in Africa: Barriers and Opportunities for Reform." World Bank Development Research Group. Policy Research Working Paper no. 4619, September 2008.
- Raballand, Gaël. "The Cost of Being Landlocked in Africa." Presented at World Bank Sustainable Development Network Week, Washington, DC, February 21, 2008.
- Raballand, Gaël, Charles Kunaka, and Bo Giersing. "The Impact of Regional Liberalization and Harmonization in Road Transport Services: A Focus on Zambia and Lessons for Landlocked Countries." World Bank Africa Sustainable Development Division. Policy Research Working Paper no. 4482, January 2008.
- Raballand, Gaël, and Patricia Macchi. "Transport Prices and Costs: The Need to Revisit Donors' Policies in Transport in Africa." Presented at BREAD Conference on Development Economics, Chicago, IL, September 27, 2008.
- Raballand, Gaël, and Supee Teravaninthorn. *Transport Prices and Costs in Africa: A Review of the Main International Corridors*. Washington, DC: World Bank, 2009.
- Simuyemba, Shemmy. "Linking Africa Through Regional Infrastructure." Africa Development Bank Economic Research Paper no. 64, 2000.
- Subramanian, Uma. "Building Competitive Trade Logistics for Global Markets." Presented at Trade Logistics Advisory Program, Washington, DC, May 5, 2008.
- Ter-Minassian, Teresa, Richard Hughes, and Alejandro Hajdenberg. "Creating Sustainable Fiscal Space for Infrastructure: The Case of Tanzania." IMF Working Paper WP/08/256, November 2008.
- United Nations Economic Commission for Africa (UNECA). "Assessment of Progress on Regional Integration in Africa." Fifth Session of the Committee on Trade, Regional Cooperation and Integration, Addis Ababa, Ethiopia, October 8–10, 2007.
- United States Trade and Development Agency (USTDA). "Remarks of Larry W. Walther." U.S.-African Growth and Opportunity Transportation and Trade Forum Opening Plenary, Cape Town, South Africa April 14, 2008.
- Van der Muelen, Dave. "Transnet's Turnaround Strategy: Remarks by Pradeep Maharaj, Group Executive for Strategy and Transformation at Transnet." *CILT World*, September 2005.
- Wood, Jonathan. "Road to New Market." *Project Finance*, September 2008.
- World Bank. *Can Africa Claim the 21st Century?* Washington, DC: World Bank, 2000.

———. *Doing Business 2008*. Washington, DC: World Bank, 2007.

———. Public-Private Infrastructure Advisory Facility (PPIAF). Private Participation in Infrastructure Database, updated October 2008. <http://ppi.worldbank.org>.

CHAPTER 4

Maritime Transport

Over 90 percent of international trade between SSA and foreign countries is conducted via maritime transport.¹ The region accounts for 2–3 percent of global merchandise trade by value, and slightly more than 2 percent of worldwide maritime cargo originates in or is destined for an SSA port.² Despite SSA’s heavy reliance on maritime transport, many ports face inadequate physical capacity to handle maritime trade volumes. The approximately 90 maritime ports in Africa³ include coastal ports and those located on inland lakes and rivers.⁴ The transport of goods between coastal and inland ports relies primarily on access to road and rail networks. By international standards, most SSA ports are small, even when compared with other ports in the developing world (table 4.1).⁵ Among the region’s coastal ports, the South African port of Durban is by far the largest in terms of annual throughput, processing nearly three times the volume of containerized cargo as the next largest port, Cape Town, also in South Africa.⁶ Although most SSA ports are state owned, the majority of shipping firms serving the region’s ports are private-sector entities.⁷

Despite the relatively small size of the SSA maritime market, several ports have undergone recent reforms and are attracting new investment. Reforms are aimed primarily at improving the operational efficiency of ports, which historically has been hampered by inadequate infrastructure, poor management, and a lack of financial resources. Reform has largely been achieved through public-private partnerships (PPPs), in which a private-sector entity is granted a concession to operate a port while the port remains under state ownership. In many cases, the private-sector entity also invests in port infrastructure and equipment. Mozambique was the first to adopt this model, transferring the management of all three of its coastal ports to private terminal operators

¹ UNCTAD, *Review of Maritime Transport 2006*, 2007, 102; USAID, “Port Congestion in Africa,” September 2005, 1. Maritime trade volumes between SSA and foreign countries are in line with the world average. According to one source, 90 percent of globally traded merchandise is transported by ship.

² UNCTAD, *Review of Maritime Transport 2006*, 2007, 104. Approximately 87 percent of the total volume of cargo exported from SSA ports is crude petroleum, with the remaining 13 percent divided evenly between minerals and metals (primarily bauxite and iron ore) and general cargo (including agricultural goods and textiles and apparel). By contrast, 90 percent of maritime cargo destined for SSA ports consists of general cargo. Crude petroleum is transported by tankers, minerals and metals are transported by break bulk carriers, and general cargo is transported by both break bulk carriers and container ships. This chapter focuses on container ship traffic, which is a growing proportion of maritime traffic in SSA.

³ Radebe, “The State of Transport in Africa,” May 16, 2005. This estimate includes ports in North Africa, but the majority of these ports are located in SSA.

⁴ Harding, Pálsson, and Raballand, “Port and Maritime Transport Challenges in West and Central Africa,” May 2007, 33; Ford, “East African Waterways Offer Cheap and Easy Transport,” August–September 2007. The term “inland waterways” refers to lakes and rivers. At present, barge traffic largely comprises inland waterway transport in SSA. Efforts to promote inland waterway transport have been pursued by regional trading blocs within SSA such as COMESA and SADC.

⁵ UNCTAD, “African Ports,” March 31, 2003, 10. Overall, African ports reportedly handle one-half of the volume of cargo traffic by container ship processed through Latin American ports and one-seventh of the volume processed through Asian ports.

⁶ UNCTAD, *Review of Maritime Transport 2006*, 2007, 102.

⁷ UNCTAD, “African Ports,” March 31, 2003, 19.

TABLE 4.1 Select leading ports in the developing world by volume of containerized cargo, 2006

Global rank ^a	Port	Country	Region	Volume in TEUs ^b
1	Singapore	Singapore	Asia	24,792,000
2	Hong Kong	China	Asia	23,539,000
3	Shanghai	China	Asia	21,710,000
5	Busan	South Korea	Asia	12,039,000
15	Guangzhou	China	Asia	6,600,000
24	Jawaharal Nehru	India	Asia	3,298,000
34	Manila	Philippines	Asia	2,772,000
37	Santos	Brazil	South America	2,446,000
41	Durban^c	South Africa	Africa	2,335,000
47	Kingston	Jamaica	Caribbean Basin	2,150,000

Sources: AAPA, "World Port Ranking: 2006," undated (accessed January 5, 2009); Aldrick, "The Global Container Port Industry," February 28, 2008.

^aBased on AAPA's ranking of the 50 largest ports worldwide.

^bTEUs = Twenty-foot equivalent units.

^cDurban is the only port in SSA that ranks among the top 50 global ports. Total containerized cargo volume for all of Africa is estimated at just over 15 million TEUs.

beginning in 1998. By 2000, 70 percent of SSA ports had some form of private-sector participation.⁸

While private-sector management of SSA ports, as well as investment in physical infrastructure, has led to modest improvements in port productivity, problems remain. In particular, the region's maritime operations continue to be adversely affected by burdensome customs procedures, inadequate access to land transport networks, and corruption, and the primary constraints facing SSA ports—inefficient operations and lack of sufficient capacity—have yet to be fully resolved.⁹ As a result, freight rates to and from SSA remain substantially higher than in other parts of the world, reducing the region's export competitiveness.

Conditions of the Maritime Transport Sector

Port Infrastructure

The top 10 ports in SSA account for nearly three-quarters of the cargo transported to and from the region. Among the region's largest and/or most active ports are Abidjan, Côte d'Ivoire, and Tema, Ghana, in West Africa; Dar es Salaam, Tanzania, and Mombasa, Kenya, in East Africa; and Durban, South Africa, and Maputo, Mozambique, in southern Africa (figure 3.1 in chapter 3 and table 4.2). Together, in 2000, these six ports accounted for almost one-half of containerized cargo transiting SSA.¹⁰ These ports also serve, and at

⁸ Ibid., 11.

⁹ Ibid., 29; U.S. Department of State, U.S. Embassy, Nairobi, "GOK Advances Pro-Business Agenda," August 28, 2008.

¹⁰ UNCTAD, "African Ports," March 31, 2003, 36–37. Ratios are estimated using data from year 2000.

TABLE 4.2 Leading ports in sub-Saharan Africa by volume of containerized cargo, 2006

Port	Region/country	Volume in TEUs ^a
West and Central Africa		
Abidjan	Côte d'Ivoire	507,119
Tema	Ghana	425,409 ^b
Dakar	Senegal	309,000 ^c
Lagos	Nigeria	226,571
Lome	Togo	203,372
Cotonou	Benin	158,201 ^c
Douala	Cameroon	148,433
East Africa		
Mombasa	Kenya	479,355 ^d
Dar es Salaam	Tanzania	352,548
Port Sudan	Sudan	326,721
Djibouti	Djibouti	221,330
Southern Africa		
Durban	South Africa	2,334,999 ^e
Cape Town	South Africa	764,753
Port Elizabeth	South Africa	407,278
Luanda	Angola	316,396 ^c
Walvis Bay	Namibia	83,263
Maputo	Mozambique	62,516

Sources: Degerlund, ed., *Containerization International Yearbook*, 2008, 157–69; *CargoSystems*, “South Africa: Coping With Growth,” May 2003, 49.

^aTEUs = Twenty-foot equivalent units.

^bInitial planned capacity = 500,000 TEUs.

^cFigures are for 2005.

^dInitial planned capacity = 250,000 TEUs.

^eInitial planned capacity = 950,000 TEUs.

times compete with one another, as transshipment points for inland destinations. For example, maritime cargo ultimately destined for the landlocked countries of Burkina Faso and Mali may be conveyed through either the ports of Abidjan or Tema, whereas cargo destined for Swaziland or Zimbabwe may transit the ports of Durban or Maputo.¹¹

In general, those SSA ports that function as the region’s major transshipment ports are characterized by relatively modern infrastructure, including deepwater berths to accommodate container ships, an adequate number of quays, or docks, to facilitate cargo movement, and dockside cranes to load and unload cargo from large vessels.¹² Other

¹¹ Ibid., 17.

¹² Ibid., 13. In a 2001 UNCTAD survey of 50 African ports, 59 percent of responding ports stated that they have terminals to accommodate container ships.

physical characteristics common among the region's highest functioning ports include the establishment of dedicated terminal facilities for containerized cargo, the use of information technology systems for the tracking and tracing of cargo as well as customs processing, and access to inland road and rail networks.¹³

The physical infrastructure of most SSA ports is inadequate, partly due to historical factors. Although many SSA ports were developed to accommodate the transport of specific types of raw materials, growth in the region's merchandise trade has expanded their use. For example, the port of Richards Bay, South Africa, was originally built in the 1970s to facilitate the shipment of South African coal, but by the 1990s, the port was processing nearly one-half of all cargo transiting South Africa. Similarly, the port of Durban grew, by necessity, from a general cargo port to a major regional transshipment hub.¹⁴ In response to increases in merchandise traffic, certain SSA ports, such as Walvis Bay, Namibia, have updated their master plans to account for changing trade patterns.¹⁵ However, despite such planning, SSA ports continue to face physical capacity constraints, especially with regard to container ship trade (box 4.1).¹⁶ These capacity constraints are exacerbated by inefficient, and at times corrupt, customs administrations.¹⁷

Service Providers

Large international shipping firms such as Danish-based Maersk and French-based CMA-CGM account for the bulk of maritime transport service between SSA and non-SSA markets.¹⁸ In particular, these two firms transport the majority of containerized cargo between SSA and Europe, the largest market for SSA exports.¹⁹ Other foreign-based shipping firms that have a substantial presence in the region include the German firm Hapag-Lloyd, the Italian firm Grimaldi Lines, and the Swiss firm Mediterranean Shipping Co. In recent years, the maritime transport market in SSA has become more concentrated, as many large shipping firms have been absorbed through corporate consolidations. For example, in 2005, Maersk purchased the liner shipping business of British-based P&O Nedlloyd, and Hapag-Lloyd merged its operations with the Canadian firm CP Ships.²⁰ Earlier, in 1999, Maersk also purchased the South African shipping firm Safmarine, one of the largest regional shipping lines providing service between SSA and foreign countries.²¹

¹³ Ghana Ports and Harbour Authority Web site. <http://www.ghanaports.gov.gh> (accessed September 18, 2008); Kenya Port Authority Web site. <http://www.kpa.co.ke> (accessed September 18, 2008); and the Maputo Port Development Company Web site. <http://www.portmaputo.com> (accessed September 18, 2008).

¹⁴ Byrne, ed., "Ports and Shipping," May 1996.

¹⁵ U.S. Department of State, U.S. Embassy, Port Louis, "USITC Study on Sub-Saharan Africa," October 2, 2008.

¹⁶ USAID, "Port Congestion in Africa," September 2005, 1.

¹⁷ Industry official, interview by Commission staff, Accra, Ghana, October 24, 2008.

¹⁸ UNCTAD, *Review of Maritime Transport 2006*, 2007, 103; CMA-CGM Web site. <http://www.cmacgm.com> (accessed September 24, 2008). In 2005, CMA-CGM purchased the liner shipping business of French firm Bolloré, which included two of Bolloré's subsidiaries, Delmas and OT Africa Line, which provide service between Europe and countries in SSA.

¹⁹ UNCTAD, *Review of Maritime Transport 2006*, 2007, 103. In 2004, 40 percent by value of African exports were destined for Europe, compared to less than 20 percent for North America.

²⁰ FMC, *45th Annual Report*, 2006, 25.

²¹ Safmarine Web site. <http://safmarine.mbendi.com> (accessed September 18, 2008); A.P.-Moller/Maersk Group, "The A.P. Moller/Maersk Group Confirms Announcement," November 2, 1999.

BOX 4.1 Containerization Trends in Sub-Saharan Africa

During the period 1995–2005, the transport of SSA imports and exports by container ship doubled, with the largest increase in containerized traffic occurring in West Africa.^a Containerized traffic between SSA and foreign countries is expected to double again by 2015, creating new demand in the region for port infrastructure to accommodate container ship trade.^b In broad terms, the increase in containerized traffic is due to a shift in the transport of certain SSA exports, including coffee and cotton, from bulk to containerized cargo, and to the region's growing trade with countries such as China that transport a large proportion of their goods by container ship.^c At present, however, the capacity of even the largest SSA ports to handle a rising volume of containerized cargo is insufficient. For example, at the port of Durban, through which two-thirds of South Africa's containerized imports and exports are transported, container ships reportedly experience delays of several days to dock at the port.^d Similar delays are encountered by container ships at the ports of Dar es Salaam, Tanzania, and Mombasa, Kenya.^e Delays caused by insufficient docking capacity, or by long wait times for loading and unloading of cargo from ships, lead to higher freight rates. For example, a small container ship may potentially incur an operating cost of \$43,000 for each day that it is delayed from docking at a port.^f To mitigate such costs, some shipping firms have imposed 'vessel delay surcharges' of as high as \$100 for each container that transits certain SSA ports; these charges are in turn passed on to importers.^g Nonetheless, certain ports in the region have been successful in addressing capacity issues for containerized traffic by attracting outside investment in infrastructure and improving port management. For example, at the port of Mombasa, the Kenya Ports Authority has established dedicated berths for one of the area's largest shipping firms and now permits cargo to be processed on a 24-hour basis.^h In addition, the port has attracted new investment from the Japanese Bank for International Cooperation (JBIC) to underwrite construction of a second container terminal to be completed in 2013.ⁱ In Durban, port upgrades have led to a sevenfold increase in the number of containers processed through the port.^j Ultimately, like Mombasa and Durban, other SSA ports that increasingly serve as regional hubs, or transshipment ports, are investing in the infrastructure and managerial expertise to handle growing containerized trade.^k

^a Mike Mundy Associates and Ocean Shipping Consultants, "Africa Infrastructure Diagnostic Study," February 28, 2008.

^b Osler, "African Ambition," April 25, 2008; UNCTAD, "African Ports," March 31, 2003, 13.

^c UNCTAD, *Review of Maritime Transport 2006, 2007*, 107; Pedersen, "Freight Transport under Globalization," 2001, 88; and USITC, Hearing transcript, October 28, 2008, 71 (testimony of Paul Kent, Nathan Associates). Growth in the region's container ship traffic has also been influenced by a trend toward the deployment of increasingly larger vessels in the world's busiest ports, allowing shippers to transport higher volumes of cargo with less frequent voyages. One result of this trend is that smaller container ships are being redeployed in markets with relatively low volumes of containerized traffic, such as those in SSA.

^d *Lloyd's List*, "Durban Bursting at the Seams," October 19, 2007; industry official, interview by Commission staff, Durban, South Africa, October 17, 2008.

^e Sambu, "Tanzania: Dar Port Delays Strain Cargo Clearance," December 5, 2007; Osler, "African Ambition," April 25, 2008.

^f SITC, Hearing transcript, October 28, 2008, 70 (testimony of Dr. Paul Kent, Nathan Associates). This figure pertains to a vessel with a capacity of 1,500 TEUs, assumed to have a daily operating cost of \$1,800 per hour.

^g Esnor, "Lurching from One Crisis to Another," November 6, 2006.

^h KPA, *2008–09 Handbook*, 2008, 7. According to the Kenya Ports Authority, the introduction of a 24-hour operating schedule has decreased ship turnaround times at the port from seven to two days, reduced the average time for a ship to wait for a berth from nearly three days to one day, and increased the number of containers moved by crane per hour from 10 to 15.

ⁱ Industry official, interview by Commission staff, Mombasa, Kenya, October 27, 2008.

^j Sambu, "Tanzania: Dar Port Delays Strain Cargo Clearance," December 5, 2007; Osler "African Ambition," April 25, 2008.

^k Government official, interview by Commission staff, Durban, South Africa, October 17, 2008.

Apart from Safmarine, there are currently few regionally based shipping firms in SSA.²² Most regionally based carriers, which were historically state owned, were dismantled in the 1990s following the entry of European and other foreign shipping lines into previously protected maritime markets.²³ These firms included Sitram in Côte d'Ivoire, Black Star Line in Ghana, and NNSL in Nigeria.²⁴ At present, the remaining SSA shipping lines primarily provide intraregional service, either along inland waterways or between two or more coastal ports.²⁵ For example, the Togo-based maritime firm Ecomarine provides container shipping services between the West African ports of Dakar, Abidjan, Lagos-Apapa, and Tema.²⁶ Similarly, Safmarine transports goods between the South African ports of Durban and East London, as well as between these cities and Maputo, Mozambique.²⁷ In Angola, state-owned shipping company Cabotang provides maritime transport between domestic coastal locations, while in Tanzania the partially privatized TRC Marine transports cargo on lakes linking Tanzania with neighboring countries.²⁸

Soft Infrastructure: Customs

Port operations remain adversely affected by customs delays and corruption. Customs-related issues that most commonly hamper portside operations include multiple clearance procedures, delays in the release of imported and exported cargo from the port, and in some cases, corrupt customs officials. For example, goods processed at the port of Mombasa must be cleared by three separate government agencies: the Kenya Ports Authority, the Kenya Revenue Authority, and the Kenya Bureau of Standards.²⁹ At the port of Tema, delays in the release of imported cargo may increase port storage fees for importers, and in extreme cases, an importer may choose to abandon cargo at the port rather than to accrue such charges. In addition, although the port of Tema has been successful in reducing corruption, largely by the introduction of automated customs technology, importers and exporters may still bribe customs officials in return for an expedited clearance of goods.³⁰

Not surprisingly, goods that are destined for landlocked countries generally experience more clearance procedures and longer delays at the port of entry than do goods destined for the local market. For instance, it reportedly takes five additional days for the port of Dar es Salaam, Tanzania, to clear cargo that is en route to the neighboring countries of Burundi, Rwanda, or Uganda.³¹ Similarly, in 2005, goods that arrived at the port of Mombasa, Kenya, bound for Uganda spent an average of 13 days longer at the port than

²² Government official, interview by Commission staff, Mombasa, Kenya, October 27, 2008.

²³ Pedersen, "Freight Transport under Globalization," 2001, 90. Prior to the 1990s, shipping firms serving Africa participated in a "liner conference" system that divided major shipping routes to and from the region into three protected markets: those served by African shippers (40 percent), those served by European shippers (40 percent), and those served by other foreign shippers (20 percent). In 1992, the European Court of Justice determined that this arrangement was anticompetitive, hence opening the market to direct competition between African and non-African shipping firms.

²⁴ Harding, Pálsson, and Raballand, "Port and Maritime Transport Challenges," May 2007, 9.

²⁵ Osler, "African Ambition," April 25, 2008.

²⁶ *Africa News*, "Ghana: ECOWAS Has Done Well," September 18, 2008.

²⁷ Safmarine Web site. <http://www.safmarine.mbendi.com> (accessed September 18, 2008).

²⁸ *The Banker*, "Angola: The Slow and Steady Road to Prosperity," August 1, 2008; Tanzania National Web site. <http://www.tanzania.go.tz/transportf.html> (accessed October 8, 2008).

²⁹ U.S. Department of State, U.S. Embassy, Nairobi, "GOK Advances Pro-Business Agenda," August 28, 2008. These organizations are reportedly working towards harmonizing their clearance procedures through the establishment of common accreditation and computerized clearance systems.

³⁰ Industry official, interview by Commission staff, Accra, Ghana, October 24, 2008.

³¹ *Lloyd's List*, "The Maritime Route to Prosperity," June 18, 2008.

goods remaining in the local market (table 4.3). Ultimately, burdensome customs and inspection procedures at SSA ports lead to higher costs for goods transiting the region.³² As such, without commensurate improvements in customs administration, efforts to physically improve SSA ports will likely have less impact on the region's ability to compete in international trade.

TABLE 4.3 Comparison of container clearance and truck transit times from select SSA ports to inland locations

Route	Location of final destination for cargo	Distance in kilometers	Number of days for clearance at the port of origin	Total transit time (including port clearance)
Mombasa (Kenya) to Nairobi (Kenya)	Within country	485	5–6 days ^a	> 10 days
Mombasa (Kenya) to Kampala (Uganda)	Neighboring country	1,150	13 days ^a	> 2 weeks
Durban (South Africa) to Johannesburg (South Africa)	Within country	500	2–4 days	3–7 days ^b
Durban (South Africa) to Mbabane (Swaziland)	Neighboring country	400	2–4 days	5–7 days

Sources: Industry officials, interviews by Commission staff, Durban, South Africa, October, 21, 2008, Mombasa, Kenya, October 27, 2008, and Matsapha, Swaziland, October 23, 2008; Arvis, Raballand, and Marteau, "The Cost of Being Landlocked," June 2007, 28.

^aData from 2005.

^bIt takes approximately 18–21 hours for cargo to be transported between Durban and Johannesburg, and three additional days for such cargo to be offloaded and deposited in an inland container depot in Johannesburg.

Effects of Port Infrastructure Conditions on Export Competitiveness

Because port infrastructure in SSA was not built to support the region's diverse and growing volume of merchandise trade, infrastructure deficiencies currently result in substantial time delays and high costs for goods moving both into and out of the region.³³ For example, in 2004, lack of sufficient berthing capacity in the port of Durban led to

³² Arvis, Raballand, and Marteau, "The Cost of Being Landlocked," June 2007, 28–29.

³³ USAID, "Port Congestion in Africa," September 2005, 1; Aldrick, Drewry Shipping Consultants, Ltd., "The Global Container Port Industry," February 28, 2008. Although, on average, the capacity utilization ratio for all African ports is estimated at slightly below 80 percent, certain ports in the region have already exceeded their planned capacity design, including the ports of Durban, South Africa, and Mombasa, Kenya (table 4.2). Further, by 2012, the capacity utilization ratio of African ports is forecast to increase to nearly 100 percent.

vessel wait times of up to 66 hours.³⁴ Similarly, at the port of Mombasa, inadequate rail capacity has resulted in a backlog of more than 10,000 containers awaiting transport to inland destinations.³⁵ Finally, at the port of Tema, insufficient crane capacity has hampered port productivity. Illustratively, although the port of Tema uses two cranes per ship to load and unload containerized cargo, the port of Singapore uses as many as eight cranes to unload cargo from a single ship (table 4.4).³⁶

As a result of the infrastructure issues faced by SSA ports, maritime freight costs in the region surpass those in other countries. For example, it is estimated that manufacturers shipping from SSA pay nearly three times more in container handling charges at African ports than manufacturers shipping from Europe.³⁷ In some SSA countries, the cost of importing a standard-sized container is reportedly more than twice the world average.³⁸ Added to these charges are the indirect costs associated with time delays at the port of entry and in the transport of goods to inland destinations. Overall, in 2004, it was estimated that freight costs as a ratio of import value were approximately 10 percent for SSA, compared with an average of nearly 6 percent for all developing countries, including those in SSA. For certain landlocked countries such as Mali and Rwanda, this ratio was as high as 24 percent.³⁹

SSA's high transport costs have a negative impact on the region's ability to compete in global export markets. One study concludes that transport costs in Africa are a higher trade barrier than trade-partner tariffs on African goods.⁴⁰ For instance, although apparel from SSA benefit from lower tariffs in the United States vis-à-vis similar products from Cambodia and Bangladesh, the relatively higher transport costs associated with shipping apparel from SSA can render the product uncompetitive in the U.S. market.⁴¹ Therefore, further reform of, and investment in, SSA's ports is necessary to reduce maritime freight costs in the region and, in turn, improve export competitiveness.⁴²

Efforts to Improve the Maritime Transport Sector

In the past two decades, SSA countries have pursued varied efforts to upgrade port infrastructure and achieve regulatory reform of their maritime sectors. Although the physical improvement of certain SSA ports has enabled these ports to handle increasing

³⁴ Good, "South Africa Still Stalled Over Ports," April 27, 2004.

³⁵ U.S. Department of State, U.S. Embassy, Nairobi, "GOK Advances Pro-Business Agenda," August 28, 2008.

³⁶ Industry official, interview by Commission staff, Tema, Ghana, October 25, 2008. Average vessel size in Singapore is larger, however.

³⁷ Osler, "African Ambition," April 25, 2008.

³⁸ *Lloyd's List*, "Singapore's Connections Put It on Top of the World," November 12, 2007; UNCTAD, *Review of Maritime Transport 2006, 2007*, 118, 123. This trend, however, may be reversing. Between 2001 and 2004, the ratio of freight costs to import value decreased by 3.5 percentage points in SSA, compared to 2.0 percentage points among all developing countries and 2.5 percentage points among all countries in the world.

³⁹ UNCTAD, *Review of Maritime Transport 2006, 2007*, 123–24. Import values as reported by UNCTAD are based on freight and insurance data from the IMF *Balance of Payments Statistics* (January 2006).

⁴⁰ World Bank, *Can Africa Claim the 21st Century?*, 2000, 138.

⁴¹ USITC, Hearing transcript, October 28, 2008, 121 (testimony of Paul Ryberg, African Coalition for Trade, Inc.).

⁴² USAID, "Port Congestion in Africa," September 2005, 3–4.

TABLE 4.4 Comparison of port productivity in select SSA and non-SSA ports

Region	Port	Country	Productivity measure (crane moves per hour ^a)
Africa	Abidjan	Côte d'Ivoire	20
	Cape Town	South Africa	12
	Dar es Salaam	Tanzania	20
	Durban	South Africa	15
	Maputo	Mozambique	10
	Mombasa	Kenya	15
	Tema	Ghana	15 ^b
Asia Pacific	Hong Kong	China	40
	Manila	Philippines	30
	Shanghai	China	30
	Singapore	Singapore	35
	Sydney	Australia	27
Europe/North America	Baltimore, MD	United States	37
	Felixstowe	United Kingdom	20
	Los Angeles, CA	United States	25
	Rotterdam	Netherlands	30
	Vancouver	Canada	25
	Wilmington, NC	United States	39

Sources: Kunaka, "Ports and Corridor Performance," September 26, 2008; "Intermodal Transportation and Terminal Operations," spring 2008; North Carolina State Ports, Port of Wilmington, "Container Productivity Increases," June 23, 2005; and industry official, e-mail message to Commission staff, September 30, 2008.

^aIndicates the number of containers moved each hour by quay cranes.

^bAt a new container terminal completed at the port of Tema, productivity has reportedly increased from 15 to 30 crane moves per hour.

volumes of merchandise trade, most ports in the region remain uncompetitive by international standards. In broad terms, the poor performance of SSA ports is due to the sporadic nature of investment in port infrastructure and the lack of effective institutional reform of ports by national governments.⁴³ The latter in particular has undermined regional competition in the provision of maritime services.⁴⁴

⁴³ Osler, "African Ambition," April 25, 2008; Pedersen, "Freight Transport under Globalization," 2001, 93.

⁴⁴ USAID, "Port Congestion in Africa," September 2005, 3–4.

Port Governance

In the 1990s, many SSA countries commenced initiatives to improve the efficiency of their maritime transport sectors.⁴⁵ These efforts centered on the institutional reform of ports, which was broadly achieved through the separation of the ports' regulatory and commercial functions. Under reform, national port authorities retained regulatory oversight over of the activities of the port, while private-sector entities were granted concessions by port authorities to perform warehousing, container handling, and other commercial operations.⁴⁶ By enlisting the private sector to invest in port infrastructure and provide expertise in port operations and management, national authorities aimed to increase the productivity of their ports. Improved port productivity, in turn, would enable SSA ports to compete more effectively with one another to handle the region's growing merchandise trade volumes.⁴⁷

Regulatory reform of ports in SSA has not been accompanied by ownership reform—that is, most ports in the region remain under state ownership.⁴⁸ Nonetheless, reform has shifted the number of ports previously classified as “operating” ports to “landlord” status. Under an operating port, the ownership and management of port assets, including terminal facilities and equipment, remain with the port authority, but the port authority may lease these facilities to private-sector entities.⁴⁹ By contrast, under a landlord port, the port authority also retains ownership of port infrastructure, but permits private-sector firms to carry out cargo handling and other port functions using their own equipment, and to invest in the building of new facilities.⁵⁰

At present, some of the most active ports in SSA function under the landlord model, including Dar es Salaam, Maputo, and Tema.⁵¹ In general, these and other ports in the region followed a similar path toward private-sector participation: port restructuring followed by long-term concessions to private entities. For example, after disaggregating its commercial operations from the port authority in 2000, Dar es Salaam established a two-member consortium led by Filipino-based International Container Terminal Services to operate the port.⁵² The consortium was granted a 10-year concession, during which time it was charged with improving port productivity and upgrading port equipment and terminal infrastructure. Similarly, also in 2000, the port of Maputo granted a 15-year

⁴⁵ UNCTAD, “Comparative Analysis of Deregulation,” May 24, 1995, 16. Efficiency measures in the maritime transport sector include such parameters as vessel turnaround times, container dwell times in a port, cargo handling charges, and port call charges.

⁴⁶ UNCTAD, “African Ports,” March 31, 2003, 19. The arrangement is commonly termed a public-private partnership (PPP).

⁴⁷ UNCTAD, “Comparative Analysis of Deregulation,” May 24, 1995, 5.

⁴⁸ Osler, “African Ambition,” April 25, 2008.

⁴⁹ UNCTAD, “African Ports,” March 31, 2003, 9; World Bank, “Module 3,” 2007, 83–84; and USITC, Hearing transcript, October 28, 2008, 136 (testimony of Paul Kent, Nathan Associates). Under an operating port, private-sector participation is limited, particularly with regard to cargo handling services, which are often carried out by the port authority. However, in many countries, such as Argentina, Chile, the Netherlands, and Singapore, the landlord port has become the standard institutional framework for port governance. In particular, the landlord port is seen as the most effective model for involving the private sector in port management and investment while still maintaining public-sector oversight of port activities.

⁵⁰ UNCTAD, “African Ports,” March 31, 2003, 12, 15. Private-sector entities may build new port infrastructure under a build-operate-transfer arrangement, under which newly constructed assets revert to the ownership of the national port authority once the term of a concession has expired.

⁵¹ *Ibid.*, 12–16.

⁵² Hutchinson Whampoa Limited, “Hutchinson Port Holdings Acquires Overseas Assets,” May 28, 2001. In May 2001, the overseas port development operations of International Container Terminal Services were acquired by Hong Kong-based Hutchinson Holdings.

concession to a private-sector consortium that later formed the Maputo Port Development Company (MPDC).⁵³ MPDC is currently responsible for managing the operations of the port, including those of newly privatized terminals developed for niche markets, such as coal and fresh produce.⁵⁴ Finally, in 2002, the Ghana Ports and Harbours Authority converted the port of Tema to landlord status, while maintaining regulatory authority over the port, and permitted private firms to engage in cargo-handling services through concessions.⁵⁵

Elsewhere, SSA countries have pursued slightly different forms of private-sector participation in port activities. For instance, in June 2000, global terminal operator Dubai Ports Worldwide (DPW) signed a 20-year management contract with the Djibouti Port Authority to oversee the entire operation of the port.⁵⁶ In South Africa, institutional reform has resulted in the establishment of two new entities to regulate and manage the country's seven ports: the Transnet National Ports Authority and Transnet Port Terminals. The Transnet National Ports Authority serves as the port regulator, whereas private firms engage in portside operations through either leasing contracts or concessions.⁵⁷ By contrast, Kenya's port of Mombasa has not yet undergone regulatory reform, but nonetheless permits private-sector participation in 60 percent of port operations.⁵⁸

Investment in Port Infrastructure

Regulatory reform of SSA ports and private-sector participation in port operations has brought new investment in port infrastructure (table 4.5). Many of the infrastructure projects are designed to position SSA ports to accommodate growing container ship trade in the region. For example, in 2007, private terminal operator APM, a subsidiary of the Danish shipping firm Maersk, invested \$75 million to upgrade the Nigerian port of Lagos-Apapa. APM's investment included the refurbishment of gantry cranes used to load and unload cargo from container ships. The project reportedly resulted in an average monthly increase in container throughput of nearly 50 percent, and helped alleviate congestion at the port.⁵⁹ In Djibouti, terminal operator DPW has invested in the construction of a container terminal. The new terminal will enable the port to serve as a primary entry point for goods destined for East Africa.⁶⁰ At the same time, several other SSA ports plan to increase their container terminal capacity with funding from the private sector, including Dakar, Douala, Durban, and Mombasa.⁶¹

⁵³ Furlonger, "Harbors—1. Grinding Out Growth," December 21, 2007; UNCTAD, "African Ports," March 31, 2003, 12–16; and PMAESA, "Maputo: Meeting Expectations," 2008, 46. Shareholders in the Maputo Port Development Company currently include Portuguese firm Portus Indico, Mozambican railway operator CFM, and the government of Mozambique.

⁵⁴ *Lloyd's List*, "Peel Strips its Activity with Sale of Maputo Stake," January 3, 2008.

⁵⁵ UNCTAD, "African Ports," March 31, 2003, 19; industry official, e-mail message to Commission staff, September 30, 2008.

⁵⁶ Port of Djibouti—DP World Web site. <http://www.dpworld-djiboutiport.com/sublevel.asp?pageid=8> (accessed October 2, 2008).

⁵⁷ UNCTAD, "African Ports," March 31, 2003, 31.

⁵⁸ *Lloyd's List*, "Privatisation on Cards for Mombasa," July 23, 2008; *Lloyd's List*, "Mombasa Gets Box Jam Lifeline from Andersen," August 12, 2008; and government official, interview by Commission staff, Mombasa, Kenya, October 27, 2008. The Kenya Ports Authority reportedly has plans to convert the port to landlord status.

⁵⁹ *Lloyd's List*, "Success Story of Apapa," July 17, 2008.

⁶⁰ *Lloyd's List*, "World Bank Guarantee for Djibouti Box Terminal," July 17, 2008.

⁶¹ Mike Mundy Associates and Ocean Shipping Consultants, "Africa Infrastructure Diagnostic Study," February 28, 2008.

TABLE 4.5 Select infrastructure investments in SSA ports

Port	Investment	Major stakeholder(s)
Dakar, Senegal	Expansion of existing container terminal, building of new terminal	Dubai Ports Worldwide (United Arab Emirates)
Dar es Salaam, Tanzania	Gantry cranes, computer systems	Hutchinson Whampoa (Hong Kong)
Douala, Cameroon	Deep-sea port construction, new container terminal	A.P.-Moller/Maersk Group (Denmark); Bolloré Group (France)
Djibouti, Djibouti	New container terminal	Dubai Ports Worldwide (United Arab Emirates)
Durban, South Africa	New container terminal	Transnet National Port Authority (South Africa)
Lagos-Apapa, Nigeria	Gantry cranes	A.P.-Moller/Maersk Group (Denmark)
Maputo, Mozambique	New terminals for granite and metals, expansion of container terminal capacity, dredging of water channel to port	Dubai Ports Worldwide (United Arab Emirates); Government of Mozambique
Mombasa, Kenya	Construction of a second container terminal, the first phase scheduled for completion in 2013	Japanese Bank for International Cooperation (Japan)
Tema, Ghana	New container terminal	Ghana Ports and Harbours Authority (Ghana); A.P.-Moller/Maersk Group (Denmark)

Sources: Industry officials, interviews by Commission staff, Johannesburg, South Africa, October 23, 2008, and Mombasa, Kenya, October 27, 2008; Dickenson, "Tanzanian Port Has Big Aspirations," April 1, 2003; *Lloyd's List*, "Success Story of Apapa," July 17, 2008; Mike Mundy Associates and Ocean Shipping Consultants, "Africa Infrastructure Diagnostic Study," February 28, 2008; Port of Djibouti Web site. <http://www.dpworld-djiboutiport.com> (accessed January 13, 2009); Port of Maputo Web site. <http://www.portmaputo.com> (accessed January 13, 2009); Port of Douala Web site. <http://www.otal.com/cameroon/index.htm#psi> (accessed January 13, 2009); and Ghana Ports and Harbours Authority Web site. <http://www.ghanaports.gov.gh> (accessed January 13, 2009).

Competition among SSA ports for transshipped cargo has also led them to improve their own infrastructure.⁶² For instance, the port of Dar es Salaam plans to compete with Mombasa as the primary transshipment hub for goods in East Africa. Consequently, with the aid of Hong Kong-based terminal operator Hutchison-Whampoa, the port has invested in new cranes and computer systems to increase cargo throughput.⁶³ In southern Africa, the port of Maputo is upgrading terminal equipment and warehousing facilities, as well as expanding the harbor to accommodate Panamax vessels—all with the goal of

⁶² Pringle, "African Ports Lack Capacity," June 4, 2008; USITC, Hearing Transcript, October 28, 2008, 135 (testimony of Paul Kent, Nathan Associates). In transshipment, containerized cargo is offloaded from a "mother" vessel at a port and placed on a "feeder" vessel that transports the cargo to its final destination.

⁶³ Dickenson, "Tanzanian Port Has Big Aspirations," April 1, 2003; government official, interview by Commission staff, Mombasa, Kenya, October 27, 2008.

attracting traffic from the area's largest port, Durban.⁶⁴ Finally, the port of Tema now competes, to some extent, with Abidjan as a major transshipment hub in West Africa.⁶⁵ The port recently completed improvements to its docks to facilitate the loading of cargo onto ships, thus decreasing vessel turnaround time and port productivity. In addition, the Ghanaian port authority has established an offsite cargo processing center in the town of Kumasi to expedite the movement of goods from the coastal ports of Tema and Takoradi to inland locations.⁶⁶

As an additional means of handling increasing volumes of containerized cargo, some ports in SSA have developed inland container freight stations (CFS). The CFS, which may be located within export processing zones (EPZs) and some distance from the port, are built and managed by private-sector firms. These facilities are not only responsible for the unloading and storage of containerized cargo, but also for the retrieval and transport of such cargo inland from the port and for the submission of customs documentation to port authorities. Although the purpose of CFS is to relieve congestion at coastal ports, some CFS facilities, such as those located outside Mombasa, have ultimately added to such congestion. In particular, these facilities reportedly lack adequate equipment to unload containers from ships, as well as a sufficient number of trucks to transport containers to CFS inland warehouses. Moreover, because CFS operators receive revenue for storing containers, they have little incentive to move containers out of storage in a timely manner.⁶⁷

Another important segment of port infrastructure investment among SSA countries is customs processing technology. For example, the Kenya Ports Authority (KPA) implemented an Electronic Data Interchange system that enables shipping lines to submit cargo data electronically to the port authority.⁶⁸ As a result, customs clearance time at the port of Mombasa was reduced from six to two days. KPA ultimately hopes to reduce clearance time to less than one day.⁶⁹ Similarly, the port of Durban has adopted the use of electronic manifests, which allows South African customs agents to clear incoming cargo before arrival at the port.⁷⁰

⁶⁴ World Bank, "Module 2," 2007, 38, 41; Furlonger, "Harbors—1. Grinding Out Growth," December 21, 2007. Panamax vessels are one of the largest classes of container ship and were introduced in the 1970s to transit the Panama Canal. In the 1990s, construction began on "post-Panamax" container ships, so named because the dimensions of these vessels were too large to permit them to pass through the Panama Canal. At present, a Panamax vessel can carry containerized cargo of up to 4,800 TEUs in volume, whereas a post-Panamax vessel may transport as much as 10,000 TEUs of cargo. Designs are underway for the construction of "mega-container ships," that will have cargo-carrying capacity of up to 18,000 TEUs.

⁶⁵ UNCTAD, *Review of Maritime Transport 2006, 2007*, 116; industry official, e-mail message to Commission staff, September 30, 2008.

⁶⁶ EIU, "Resources and Infrastructure," September 7, 2007; Pedersen, "Freight Transport under Globalization," 2001, 93; and government official, interview by Commission staff, Mombasa, Kenya, October 27, 2008. Aside from Ghana, other SSA countries such as Kenya and Tanzania have developed inland cargo handling and storage facilities, also known as container freight stations, as a means of alleviating congestion at coastal ports.

⁶⁷ Government official, interview by Commission staff, Mombasa, Kenya, October 27, 2008.

⁶⁸ PMAESA, "KPA Reaps from ICT Advantages," 2008, 46.

⁶⁹ Government official, interview by Commission staff, Mombasa, Kenya, October 27, 2008.

⁷⁰ Government official, interview by Commission staff, Durban, South Africa, October 17, 2008.

Bibliography

- Africa News*. “Ghana: ECOWAS Has Done Well, Says Minister,” September 18, 2008.
- Aldrick, Katy. Drewry Shipping Consultants, Ltd. “The Global Container Port Industry: Implications for Africa?” Presented at the 6th Intermodal Africa 2008 Conference, Accra, Ghana, February 28, 2008.
- American Association of Port Authorities (AAPA). “World Port Ranking: 2006,” undated. <http://www.aapa.org> (accessed January 5, 2009).
- A.P.-Moller/Maersk Group. “The A.P. Moller/Maersk Group Confirms Announcement by Safmarine.” News release, November 2, 1999. <http://media.maersk.com/en/PressReleases/1999/Pages/TheAPMollerMaerskGroupconfirmsannouncementbySafmarine.asp>.
- Arvis, Jean-François, Gaël Raballand, and Jean-François Marteau. “The Cost of Being Landlocked: Logistics Costs and Supply Chain Reliability.” World Bank Policy Research Working Paper no. 4258, June 2007.
- Banker*. “Angola: The Slow and Steady Road to Prosperity,” August 1, 2008.
- Byrnes, Rita M., ed. “Ports and Shipping.” *South Africa: A Country Study*. Federal Research Division. Library of Congress, May 1996. <http://www.country-data.com/frd/cs/zatoc.html#za0094>.
- CargoSystems*. “South Africa: Coping With Growth,” May 2003.
- Degerlund, Jane, ed. *Containerization International Yearbook, 2008*. London: Lloyd’s MIU, 2008.
- Dickenson, Daniel. “Tanzanian Port Has Big Aspirations.” *BBC News*, April 1, 2003.
- Esnor, Linda. “Lurching from One Crisis to Another.” *Business Day* (South Africa), November 6, 2006.
- Federal Maritime Commission (FMC). *45th Annual Report, Fiscal Year 2006*. Washington, DC: FMC, 2006.
- Ford, Neil. “East African Waterways Offer Cheap and Easy Transport.” *African Business* via *BNET.com* August–September 2007. http://findarticles.com/p/articles/mi_qa5327/is_/ai_n29371028.
- Furlonger, David. “Harbors—1. Grinding Out Growth.” *Financial Mail* (South Africa), December 21, 2007.
- Good, Nicola. “South Africa Still Stalled Over Ports.” *Lloyd’s List*, April 27, 2004.
- Harding, Alan, Gylfi Pálsson, and Gaël Raballand. “Port and Maritime Transport Challenges in West and Central Africa.” Appendix 1: Geographical Classification of African Countries. World Bank Sub-Saharan Africa Transport Policy Program (SSATP) Working Paper no. 84, May 2007.
- Hutchinson Whampoa Limited. “Hutchinson Port Holdings Acquires Overseas Assets of International Container Terminal Services, Inc.” News release, May 28, 2001. <http://www.irasia.com>.

“Intermodal Transportation and Terminal Operations.” Transportation Logistics course presentation, University of Washington, spring 2008.

Kenya Ports Authority (KPA). *2008–09 Handbook*. Mombasa, Kenya: KPA, 2008.

Kunaka, Charles. World Bank Sub-Saharan Africa Transport Policy Program (SSATP). “Ports and Corridor Performance.” Presented at the Port Congestion Workshop sponsored by the Port Management Association of East and Southern Africa (PMAESA), Mombasa, Kenya, September 26, 2008.

Lloyd’s List. “Durban Bursting at the Seams; Congestion Is a Major Issue As Peak Season Looms at Africa’s Busiest Port,” October 19, 2007.

———. “The Maritime Route to Prosperity: Study Links Port Access to Economic Welfare,” June 18, 2008.

———. “Mombasa Gets Box Jam Lifeline from Andersen,” August 12, 2008.

———. “Peel Strips its Activity with Sale of Maputo Stake,” January 3, 2008.

———. “Privatisation on Cards for Mombasa: Maersk Chief’s Talks with Kenyan Vice-President Fuel Local Speculation,” July 23, 2008.

———. “Singapore’s Connections Put It on Top of the World: Asian Maritime and Logistics Hub Wins World Bank’s Vote after Survey of 150 Countries,” November 12, 2007.

———. “Success Story of Apapa,” July 17, 2008.

———. “World Bank Guarantee for Djibouti Box Terminal,” July 17, 2008.

Mike Mundy Associates and Ocean Shipping Consultants. “Africa Infrastructure Diagnostic Study: Port Sector.” Presented at the 6th Intermodal Africa 2008 Conference, Accra, Ghana, February 28, 2008.

North Carolina State Ports. Port of Wilmington. “Container Productivity Increases.” News release, June 23, 2005. <http://ncports.com>.

Osler, David. “African Ambition: With Many African Economies Now Growing at a Steady Rate, What Role Can the Maritime Industries Have in Ensuring the Often Volatile Continent Reaches Its Full Potential?” *Lloyd’s List*, April 25, 2008.

Pedersen, Poul Ove. “Freight Transport under Globalization and Its Impact on Africa.” *Journal of Transport Geography* 9 (2001): 85–99.

Port Management Association of Eastern & Southern Africa (PMAESA). “Maputo: Meeting Expectations.” *Our Ports* 4, no. 1, 2008.

———. “KPA Reaps from ICT Advantages.” *Our Ports* 4, no. 1, 2008.

Pringle, Chanel. “African Ports Lack Capacity to Meet Growing Demand.” *Engineering News Online*, June 4, 2008. <http://www.engineeringnews.co.za>.

- Radebe, Jeff. "The State of Transport in Africa." Presented at the International Transport Convention 2005, Limpopo Province, South Africa, May 16, 2005.
- Economist Intelligence Unit (EIU). "Resources and Infrastructure: Transport, Communications and the Internet." *Country Profile Select*, September 7, 2007.
- Sambu, Zeddy. "Tanzania: Dar Port Delays Strain Cargo Clearance." *Business Daily* (Kenya), December 5, 2007. <http://www.afrika.no/noop/page.php?p=Detailed/15571&print=1>.
- UNCTAD. "African Ports: Reform and the Role of the Private Sector." UNCTAD/SDTE/TLB/5, March 31, 2003.
- . "Comparative Analysis of Deregulation, Commercialization and Privatization of Ports." UNCTAD/SDD/PORT/3, May 24, 1995.
- . *Review of Maritime Transport 2006*. New York and Geneva: UNCTAD, 2007.
- U.S. Agency for International Development (USAID). "Port Congestion in Africa: Implications for Competitiveness and Economic Growth." *Trade Developments*, September 2005.
- U.S. Department of State. U.S. Embassy, Nairobi. "GOK Advances Pro-Business Agenda (Nairobi 002039)," August 28, 2008.
- U.S. Department of State. U.S. Embassy, Port Louis. "USITC Study on Sub-Saharan Africa: Effects of Infrastructure Conditions on Export Competitiveness (Port Louis 00346)," October 2, 2008.
- U.S. International Trade Commission (USITC). Hearing transcript in connection with inv. no. 332-477, *Sub-Saharan Africa: Effects of Infrastructure Conditions on Export Competitiveness, Third Annual Report*, October 28, 2008.
- World Bank. *Can Africa Claim the 21st Century?* Washington, DC: World Bank, 2000.
- . "Module 2: The Evolution of Ports in a Competitive World." *Port Reform Toolkit, Second Edition, 2007*. Washington, DC: World Bank, 2007.
- . "Module 3: Alternative Port Management Structures and Ownership Models." *Port Reform Toolkit, Second Edition, 2007*. Washington, DC: World Bank, 2007.

CHAPTER 5

Electricity

SSA's electricity infrastructure is the least developed, least accessible, least reliable, most costly to operate, and highest priced of any region in the world.¹ In 2006, the total generation capacity of electricity systems installed in SSA was equivalent only to that in Spain alone. Electricity installed, produced, and consumed in SSA is concentrated in its most developed country, South Africa. Even there, however, the government has declared the current state of the electricity generation system a national emergency, likely to continue for years. Moreover, electricity costs to firms have substantially increased in recent years, especially in numerous countries subject to prolonged and/or frequent power outages. These conditions inhibit the development of the manufacturing, agricultural product processing, and service industries.

In 2006, 26 percent of the population in SSA had access to electricity (figure 5.1), about one-half the electrification rate of the next-lowest region, South Asia. In rural areas, only 8 percent of the population, on average, had electricity.² Consequently, annual consumption of electricity per person is low throughout SSA. In certain countries, the cost of power to consumers is prohibitively expensive, irrespective of access to electric power.

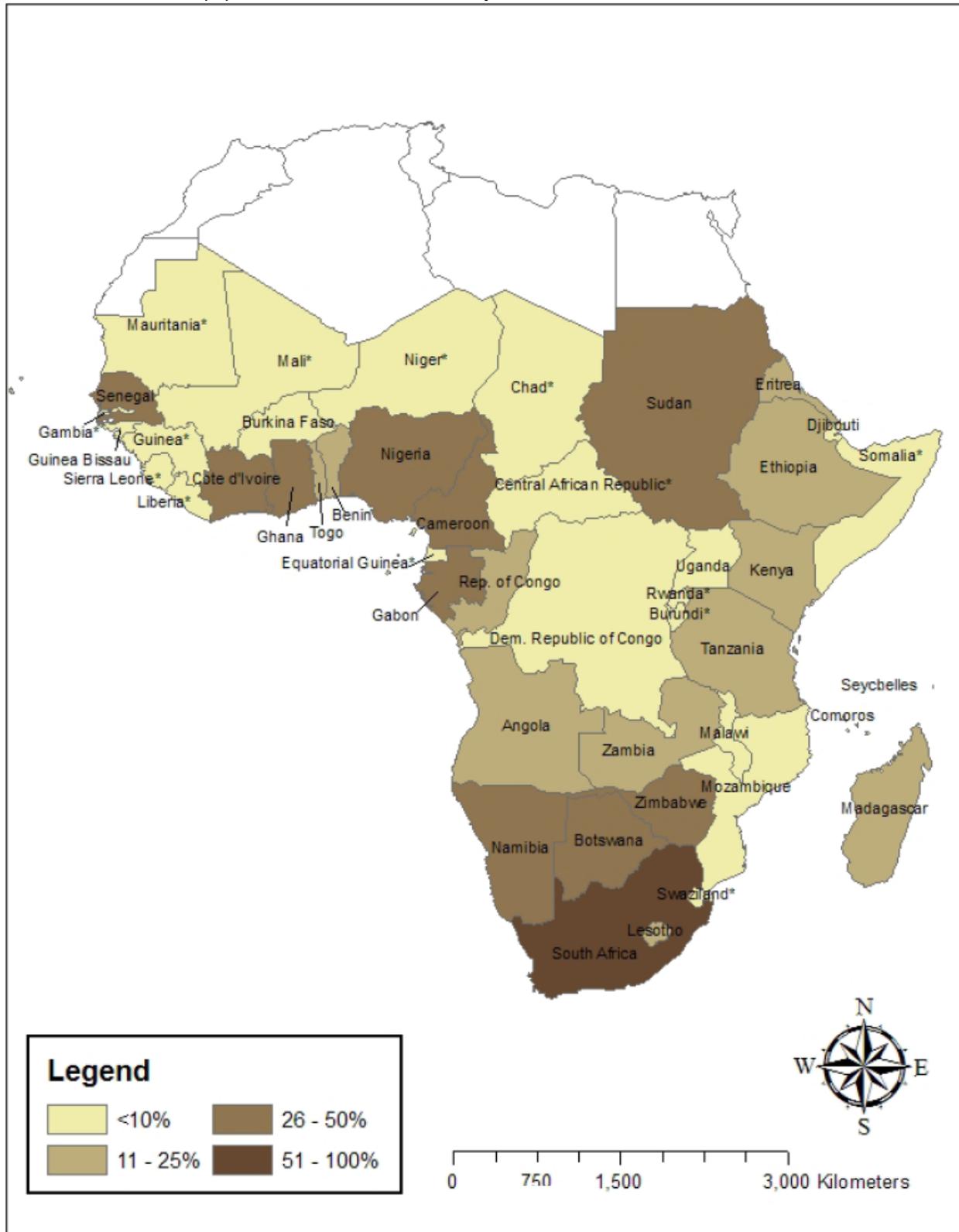
Decades of insufficient investment and poor management by national governments in state-owned electric utilities have exposed populations and businesses to irregular electricity availability. Outdated equipment and poor maintenance have resulted in high operating costs for electric utilities and a formidable treasury expense for SSA governments that have opted not to allow electricity rates to reflect such high costs. As a result of electricity sector inefficiencies, SSA consumes more electric power per dollar of income earned than any other region, despite also having the world's lowest access to, and use of, electricity.

Prompted by multilateral lending institutions led by the World Bank, national governments in SSA have instituted regulatory reforms in the electricity sector. The reforms have facilitated improvements in the financial position of numerous state-owned electric utilities. Further, reforms have begun to encourage efforts to arrive at viable electricity rates and to improve the climate for investment, especially in generation. Some countries have created new structures to oversee the provision of electricity to underserved populations. Most countries have established a regulator for the electricity sector, although the regulatory agencies are still mostly new and gradually building capacity and expertise.

¹ IMF, *Regional Economic Outlook*, April 2008, 74–93.

² OECD, IEA, *World Energy Outlook 2006*, 2006, 567.

FIGURE 5.1 Percent of population with access to electricity in sub-Saharan Africa



Source: Adapted from OECD, IEA, *World Energy Outlook 2006*, 568–69.

*Note: The International Energy Agency (IEA) does not directly report data for the following countries: Burundi, Chad, Equatorial Guinea, The Gambia, Guinea, Liberia, Mali, Mauritania, Niger, Rwanda, Sierra Leone, Somalia, and Swaziland. For these countries, the IEA estimates an average electrification rate of 7.5 percent, although actual electrification rates may be higher or lower.

In 2007, investments in the electricity sector in SSA increased by 62 percent, to \$3.9 billion, as compared with the previous year.³ However, the investments in 2007 appear to have fallen more than 50 percent short of the World Bank's estimate of the amount needed annually through 2015 to keep pace with projected increased electricity demand.⁴ Consensus is building that the way forward on investment, as well as capacity building, is through regional initiatives and planning that include generation, transmission, and distribution as a complete system rather than disparate elements.⁵

Conditions of the Electricity Sector

Electricity Infrastructure

Generation infrastructure installed in SSA had a total capacity of about 67 gigawatts (GW) of electricity in 2006.⁶ The extent of installed electric power generation varies widely by country. South Africa dominates with about 43 GW, followed by Nigeria with approximately 6 GW. Seven countries spread throughout the continent have 1 to 3 GW.⁷ The twelve countries with the smallest generation capacity all have less than one-tenth of 1 GW (i.e., less than 100 megawatts (MW)).⁸ South Africa has added 2.6 GW since 2005, which is more generation capacity than most other SSA countries have had installed at any time.

In addition to country differences, wide gaps in the extent of installed generation exist between urban and rural areas in SSA. In 2005, electricity from a grid was available to 58 percent of the population in urban areas but only 8 percent in rural areas. A combination of poverty and very low population density in many rural areas accounts, in part, for the disparity. Installed generation in the region has been stagnant over several decades.⁹ In South Africa, despite increasing demand, long-anticipated private investment to expand generation capacity did not materialize for more than a decade. Finally, in 2004, the government authorized its state-owned electric utility company Eskom to significantly expand generation capacity. However, by that time, long-predicted declines in excess electricity reserves had materialized, foreshadowing recent disruptions in electric power

³ ICA, "Significant Increase in Commitments to Infrastructure Projects in Africa," July 2008, 1. In addition to the World Bank, the total includes financing from member governments of the G8 countries, the European Commission and European Investment Bank, the African Development Bank (AfDB), and other African institutions.

⁴ Foster, et al., "Building Bridges," 2008, 26.

⁵ Electricity is generated (produced) by the combustion of fossil fuels, a nuclear reaction, or the controlled release of renewable energy to drive turbines. Except for electricity captured for the generator's own use, electricity produced is transported from generators along high voltage transmission networks (grids) in bulk to large industrial users or to a distribution network of lower voltage electricity lines and substations through which distributors provide electricity to consumers. (Definition adapted from WTO, Council for Trade in Services (CTS), "Energy Services," September 9, 1998, 5.)

⁶ ICA, "Power Supply Situation in Africa," March 13–14, 2008.

⁷ These countries include the Democratic Republic of the Congo (DRC), Mozambique, and Zimbabwe (2 to 3 GW each), and Côte d'Ivoire, Ghana, Kenya, and Zambia (between 1 and 2 GW each).

⁸ One MW equals one million watts and one kW equals 1,000 watts, where watts measure power (the flow of electric current). In comparison, the measurement of power consumed over a period of time is expressed in watt-hours, i.e., the number of hours in which one watt is consumed continuously. (Definition adapted from *Energy Industry Issues Newsletter*, "What Is a Megawatt?" June 24, 2003.)

⁹ IMF, *Regional Economic Outlook*, April 2008, 74.

consumption there and in certain neighboring countries to which South Africa exports electricity.¹⁰

Electricity generation infrastructure in many SSA countries is inefficient and costly for several reasons. First, about one-third of installed capacity in East and West Africa relies on diesel fuel to drive power-plant generators, costing at least \$0.20 per kWh more to operate than hydroelectric systems. Second, small electricity systems with a capacity below 200 MW, which are installed in most countries throughout the region, lack economies of scale and thus cost more to operate per kWh than larger systems. Electric power system operating costs per kWh are also higher in landlocked countries than in coastal countries, due in part to the cost of importing equipment and fossil fuel.¹¹ Third, about one-fourth of SSA's entire installed generation capacity is not in operating condition. For example, in Nigeria only 19 of 79 installed generating units operated in 2001¹² and only one-third of the turbines were able to operate recently at the Democratic Republic of the Congo's (DRC) chief generation facility.¹³

Major reasons for operational deficiencies include natural causes, especially drought for hydropower facilities (drought directly affects the ability of hydropower plants to maintain sufficient water levels at adjacent dams in order to operate); increasingly overextended use of decades-old generation infrastructure; political conflicts; and the inability of management to contain costs and technically balance electricity supply and demand. Water and power rationing and power outages have frequently affected Kenya and Ghana,¹⁴ among many other countries highly dependent on hydropower for generation. Projected growth in demand for electricity in SSA for the next 20 years could average 5 percent per year, while investment growth rates in electricity infrastructure in recent years have lagged behind demand.¹⁵ Political conflicts have damaged electricity infrastructure in all regions of SSA over time and in at least nine countries as recently as 2007.¹⁶ Rehabilitation and maintenance have received low budget priorities by SSA governments for at least a decade. As a result, engines wear out prematurely, fuel and lubricant usage increases, and capital costs per unit of electricity produced also increase.¹⁷ In South Africa, capital costs per unit have increased in recent years because of the necessity to schedule more frequent plant maintenance on its system to keep pace with high demand.

In recent years, at least nine countries' governments leased a total of approximately 700 MW of emergency power generation equipment for one to three years as a rapidly deployable, although costly, temporary solution to electricity shortages. In countries such as Madagascar, Rwanda, Sierra Leone, and Uganda, electricity produced by leased

¹⁰ Industry official, interview by Commission staff, Johannesburg, South Africa, October 14, 2008.

¹¹ IMF, *Regional Economic Outlook*, April 2008, 78–79.

¹² Ex-Im Bank, "Power Projects in Africa," April 17–18, 2008, 38.

¹³ ICA, "Power Supply Situation in Africa," March 13–14, 2008.

¹⁴ UNECA, *Economic Report on Africa 2004*, 2004, 130. For example, though far apart geographically, these countries experienced annual declines of at least 3 percentage points in GDP as a result of electricity disruptions due to droughts in the late 1990s. Droughts in recent years continued to interfere with the generation of electricity in countries such as Kenya, which could produce power for only a few hours per day in 2007.

¹⁵ Richards, Written testimony to the USITC, October 28, 2008, 3.

¹⁶ IMF, *Regional Economic Outlook*, April 2008, 76.

¹⁷ UNECA, *Economic Report on Africa 2004*, 2004, 131.

equipment constituted more than 30 percent of the total installed capacity and cost the countries at least 2 percent of their GDP.¹⁸

Electricity transmission infrastructure (the national electricity grid) is deficient in much of SSA. Increased instances of transmission system failure due to inadequate funding of equipment and facility maintenance, repair, and replacement adversely affect many SSA countries. For example, in 2008, the South African utility Eskom reported its worst transmission system performance since 2002, attributable largely to equipment malfunctions.¹⁹ In SSA, transmission grids often span substantial distances between generation and distribution centers, which contribute to system failure. Moreover, electricity grids in certain countries are incompatible with each other, as they operate on different frequencies and voltages or use different equipment standards.²⁰ Further, numerous national grids are not sufficiently developed to connect to transmission systems in neighboring countries.²¹

Like the high-voltage transmission infrastructure that carries generated electricity to distributors, the distribution infrastructure in SSA experiences high technical and nontechnical system losses.²² While the international standard for losses ranges from 10 to 12 percent, some countries in SSA have experienced losses exceeding 30 percent,²³ with most of the difference attributed to nontechnical losses. Examples of nontechnical losses include illegally taking electricity from distribution lines, theft of distribution equipment, tampering with electricity meters, or distributors' failure to replace old or faulty electricity meters. Another key problem for many of the region's distribution companies is the failure of customers to pay electricity bills in full or on time. Governments themselves are often culpable. For example, a previous Kenyan administration owed its distribution utility company the equivalent of 9 percent of the company's annual revenues early in 2002.²⁴ Distribution companies in certain countries introduced prepayment meters or enhanced billing mechanisms to minimize nonpayment or delayed payment problems.

Lost revenues from nontechnical losses especially affect distribution companies already disadvantaged by low rate levels, limited government funding, and minimal private investment available to upgrade and repair distribution networks. In Ghana, for example, each of these factors inhibited improvements in the distribution system, much of which is

¹⁸ IMF, *Regional Economic Outlook*, April 2008, 77. Under a lease, small-capacity electricity generation equipment can be installed and begin providing power within a few weeks. Generators usually use diesel fuel priced at about \$0.35 per kWh, which is at least two to three times more expensive than power supplied over the national grid.

¹⁹ Eskom, *Together, Rising to the Challenge*, 2008, 56–57.

²⁰ Services Group, *Review of the Regulatory Framework*, September 2007, 16–17. Incompatibility in transmission systems even exists within the same country, as is the case in the DRC. The situation is attributable to the development of separate regional electric companies, each under different technical criteria, prior to the government's formation of a single vertically integrated electricity company.

²¹ SAICE, "The SAICE Infrastructure Report Card for South Africa: 2006," undated (accessed September 24, 2008), 14; Mbogo, "Africa: Electricity Managers Agree on Uniform Standards," June 25, 2008.

²² UNECA, *Economic Report on Africa 2004*, 2004, 129. Technical losses occur in the form of heat lost over long distances between electricity production and consumption centers. When voltage lines are too thin, the result is greater pressure and higher electricity loss. Technical losses occur in every electricity transmission and distribution system, and may be minimized by incorporating advanced technology and equipment, technically proficient management, and scheduled maintenance.

²³ Redwood-Sawyer, "Widening Access in the Context of Power Sector Reform," May 21–22, 2002, 11. Countries in SSA with high distribution losses include Nigeria, Sierra Leone, Sudan, and Uganda.

²⁴ UNECA, *Economic Report on Africa 2004*, 2004, 131.

more than 30 years old.²⁵ Inadequate distribution systems, especially at the municipal level or in smaller urban areas, are common to many SSA countries. When generation and distribution networks are out of balance with respect to electricity supply and demand, brownouts and forced power outages typically follow.

A shortage of skilled engineering personnel is common in each of the electricity infrastructure segments. In South Africa, for example, engineering professionals state that the inadequacy of operation and maintenance capacity is at least partially the result of the undersupply of skilled personnel, especially in municipal distribution networks outside major urban areas.²⁶

Energy sources currently used in electricity generation in SSA (table 5.1) are only a small fraction of the proven potential. As a region, SSA holds enormous potential for future electricity generation, including major reserves of traditional fossil fuels such as coal and natural gas; renewable resources for hydroelectric power and geothermal energy; and uranium for nuclear power.²⁷ Furthermore, these resources are distributed widely throughout SSA countries, although many of the energy sources with the highest potential for electricity generation are in countries located far from areas with high demand for electricity. Other countries with high potential for electricity generation are in the midst of or recovering from political upheaval. In most cases, countries' economies are too small to raise sufficient capital for major power generation projects, meaning that external financing must be secured.²⁸

TABLE 5.1 Energy sources used to generate electricity in 10 leading SSA countries, 2005

Country	Generation (gWh) ^a	Energy source (%)						
		Coal	Natural gas	Hydro-electric	Crude oil	Geo-thermal	Nuclear	Other
South Africa	244,920	93	(^b)	2			5	(^b)
Nigeria	23,539		53	34	13			
Mozambique	13,285		(^b)	100	(^b)			
Zimbabwe	10,269	43		57	(^b)			
Zambia	8,938	(^b)		99	(^b)			
DRC	7,419			100	(^b)			
Ghana	6,788			79	21			
Kenya	6,003			50	30	15		5
Côte d'Ivoire	5,570		74	26	(^b)			
Cameroon	4,145	94			6			

Source: OECD, IEA Web site. <http://www.iea.org/Textbase/stats/> (accessed August 7, 2008).

^aGigawatt hours.

^bLess than 0.5 percent.

²⁵ University of Ghana, Resource Center for Energy Economics and Regulation, *Guide to Electric Power in Ghana*, July 2005, 39.

²⁶ SAICE, "The SAICE Infrastructure Report Card for South Africa: 2006," undated (accessed September 24, 2008), 15; *News24.com*, "Engineer Shortage Causes Havoc," August 26, 2008. A representative of an institute of South African electrical engineers stated that the country produced 45 engineers per million people, far below levels in the United States, China, and India.

²⁷ Although off-grid solar power is sometimes used in rural areas of Africa for public buildings such as hospitals and for residential uses such as lighting, it has generally not been used in the industries covered in chap. 6 of this report because industrial processes typically require more and steadier electricity than off-grid solar power has been able to provide.

²⁸ IMF, *Regional Economic Outlook*, April 2008, 78.

Service Providers

The principal service providers in the electric power sector include national, and in certain countries, municipal utility companies. Other participants—with important responsibilities in several countries—include independent power producers (IPPs), to a lesser extent independent power distributors (IPDs), and also firms that manage and/or operate parts of or the entire electric power sector in certain countries.²⁹ Most electric utility companies in SSA remain state owned and vertically integrated. Through government reforms, numerous SSA electric utility firms have improved their financial performance in recent years. Nonetheless, such firms generate, at best, revenues sufficient to offset operating costs but insufficient to finance system maintenance or expansion.³⁰

Eskom is by far SSA's largest electric power utility. In 2008, the South African government-owned utility holding company generated about 95 percent of the electricity consumed in South Africa and 45 percent of the electricity in all of Africa.³¹ Eskom ranked ninth in electricity sales and thirteenth in generation capacity among the world's leading electric utilities in 2008. Despite its large size and predominance in electric power generation, Eskom is not a legal monopoly provider of electricity services in South Africa, except with respect to the national transmission grid.³² A subsidiary of the Eskom holding company operates electricity generation concessions in Mali, Uganda, and Zambia. Although its sales growth and return on assets (3 percent each) slowed markedly in 2008 compared to the previous year, Eskom's investment rating enabled its vast, long-delayed electricity network expansion and upgrade program to proceed. Nevertheless, increased coal prices and unforeseen reliance on costly diesel-fueled power plants propelled a 40 percent increase in Eskom's energy costs in 2008.³³

IPPs have generated electric power in SSA countries where electricity sector reforms and market conditions provide for their inclusion and encourage private investment. Nevertheless, IPPs are less prevalent in SSA than in other developing regions of the world. One reason is that locally denominated finance is not widely available, which may leave IPP projects vulnerable to currency fluctuation, as occurred in numerous SSA countries in the 1990s. Another is that terms of numerous IPP contracts negotiated during periods of crisis for electricity generation were later subject to renegotiation (some to arbitration or termination) as stakeholders and host governments faced changed electricity market conditions in several SSA countries.³⁴ Although the cost of electricity generated by IPPs usually surpasses that generated by state-owned companies, the reliability of IPP-produced electricity is generally superior. For example, IPPs in Kenya had an average electricity availability of 95 percent compared to 60 percent for the oil-

²⁹ In addition, technical, construction, and commercial specialists, system developers, and others participate in various preliminary processes over many years prior to an electric power system becoming technically operational and subsequently able to provide electricity commercially. These participants are not included in this analysis.

³⁰ IMF, *Regional Economic Outlook*, April 2008, 80.

³¹ Eskom, *Together, Rising to the Challenge*, 2008. Data for Eskom in 2008 are for the period April 1, 2007, through March 31, 2008.

³² In addition to generation and transmission activities, Eskom is responsible for the distribution of electricity to consumers directly and to 187 municipal councils in South Africa which in turn distribute and sell electric power in their jurisdiction. Further, Eskom imports and exports electricity, and conducts research and development in energy technologies. The company also provides technical, operational, and other expertise and collaboration with international and regional bodies.

³³ Eskom, *Together, Rising to the Challenge*, 2008.

³⁴ Gratwick and Eberhard, "An Analysis of Independent Power Projects," October 2007, 43–45.

fired thermal generation plants of the Kenya Generation Company (KenGen) from 2004 through 2006.³⁵ With regard to distributors, to date, IPDs have participated in only a few SSA countries: Ghana, Namibia, South Africa, Uganda, and Zimbabwe.³⁶ Few SSA governments have opened this segment of the electricity sector to independent firms or provided incentives to encourage investment in distribution by prospective IPDs.

The large U.S.-owned electricity services provider AES is the only known multinational corporation to own, operate, and manage a vertically integrated national utility in an SSA country (Cameroon). In 2001, AES acquired a 56 percent stake,³⁷ which included operation and management contracts, in the vertically integrated national electric utility renamed AES-SONEL, under a 20-year concession. An amendment to the concession agreement in 2006 provided for significantly higher rates and the ability to pass through to consumers a portion of fuel cost increases in years that deficient rainfall affects hydropower plants. In exchange, AES agreed to upgrade generation, transmission, and distribution facilities; reduce the costs of connecting new customers; and more than double the number of consumers served in the remaining 15 years of the concession.³⁸ Prior to the amended concession, AES-SONEL constructed an 85 MW oil-fired thermal power plant in 2004 to partially alleviate brownouts and load-shedding in periods of insufficient rainfall.

Effects of Electricity Infrastructure Conditions on Export Competitiveness

With few exceptions, electricity provided over national grids in SSA countries is not sufficiently affordable, reliable, or accessible. These adverse conditions impede regional and national economic growth, unfavorably affect the export competitiveness of existing SSA firms, and inhibit the development of manufacturing, agricultural product processing, and service industries.

Industrial firms in numerous countries in the region are negatively affected by extremely high electricity prices—some among the highest in the world—for publicly available power.³⁹ Moreover, the cost of connecting to electricity grids varies widely among countries. For example, average costs per connection in 2001 ranged from \$240 in South Africa to over \$1,000 in rural Kenya and Uganda.⁴⁰ Industry representatives and other experts cited high cost as the dominant concern regarding electricity infrastructure. For example, sources stated that more than 60 percent of coffee processing plants in Uganda ceased operations in recent years due in part to high electricity rates that prevented firms from using electric-powered equipment that would have allowed them to upgrade

³⁵ Gratwick and Eberhard, “An Analysis of Independent Power Projects,” 2008, 329, 333.

³⁶ UNECA and UN-Energy/Africa, “Energy for Sustainable Development,” May 2007, 57.

³⁷ The government of Cameroon owns the remaining shares and the integrated generation plants and distribution facilities.

³⁸ AES, *Form 10-K, Year Ended December 31, 2007*, March 17, 2008, 32.

³⁹ IMF, *Regional Economic Outlook*, April 2008, 75. The \$0.13 per kWh average electricity rate among SSA countries is approximately twice as high as the average for developing countries elsewhere.

Alternatively, certain SSA governments set rates artificially low (often below the cost of production) on electricity supplied through the grid, while business sectors may be required to pay higher rates than other sectors to support the low social rate.

⁴⁰ OECD, IEA, *World Energy Outlook 2002*, 2002, 381.

efficiency and remain competitive.⁴¹ By contrast, at least one-half of the coffee producers in Latin America use electric power in the pulping processes of coffee production.⁴² Similarly, shea butter producers in Burkina Faso stated that electricity rates, which are among the highest in SSA, significantly reduced operating capital available for investment in electrical equipment needed to improve product quality and efficiency.⁴³ A multinational firm reported that its manufacturing facility in Kenya paid twice as much for electricity compared to its similar plants in Asian countries.⁴⁴ A textile exporter in Chad—a country without a national grid—reported the closure of its operations largely due to the high costs of diesel-fueled electric power, which prevented it from competing with firms in neighboring countries or in Asia.⁴⁵

Manufacturing firms in SSA reported that power outages occurred, on average, approximately 56 days per year, reducing sales by 5–6 percent.⁴⁶ Interruptions in electricity—by outages (prolonged or frequent) or voltage fluctuations—especially disrupt industrial consumers that depend on continuous electric power supply. For example, in South Africa, sudden, unscheduled power outages in January 2008 severely affected textile firms that were located outside of priority industrial areas not subject to blackouts.⁴⁷

Theft and unreliable electricity provision in SSA, often from outdated and poorly maintained transmission and distribution networks, reduce the revenue earned by industrial producers by an estimated 6 percent per year.⁴⁸ Largely due to unreliable electricity supply, approximately one-half of all manufacturers in SSA are obliged to use backup diesel- or gas-fired generators at a cost approximately four times higher per kWh than that from electricity grids. For example, in a recent survey, 70 percent of firms in Kenya reported that they had acquired generators to compensate for frequent load-shedding and for the generally unreliable electricity from the grid.⁴⁹ Auxiliary electricity is often a necessity for African firms in order to adhere to contractual delivery schedules but it generally raises costs and reduces competitiveness.

For many firms—especially small- and medium-sized firms—the cost of purchasing and operating generators is prohibitive.⁵⁰ Firms in Kenya and Rwanda stated that the use of fossil fuel-fired backup generators increased electricity costs by 20–50 percent and total production costs by up to 25 percent.⁵¹ Several firms in different countries noted that they purchased multiple generators to maintain continuous power supply when a generator required maintenance. Other firms stated that grid-provided electricity was so unreliable,

⁴¹ Industry official, interview by Commission staff, Kampala, Uganda, October 22, 2007. For more information on the coffee industry in SSA, see chap. 6 of this report.

⁴² USITC, Hearing transcript, October 28, 2008, 55 (testimony of Scott Clark, TechnoServe).

⁴³ Industry officials, interviews by Commission staff, Ouagadougou, Burkina Faso, October 23, 2008. For more information on the shea butter industry in SSA, see chap. 6 of this report.

⁴⁴ Industry official, interview by Commission staff, Nairobi, Kenya, October 31, 2008.

⁴⁵ USITC, Hearing transcript, October 28, 2008, 37–38, 80 (testimony of Christopher Goldthwait). For more information on SSA's textiles and apparel industries, see chap. 6 of this report.

⁴⁶ IMF, *Regional Economic Outlook*, April 2008, 75.

⁴⁷ Industry official, interview by Commission staff, Johannesburg, South Africa, October 14, 2008.

⁴⁸ Foster, et al., "Building Bridges," 2008, ix.

⁴⁹ Ramachandran, "Power and Roads for Africa," March 2008, 6; Ramachandran, Written testimony to the USITC, October 27, 2008.

⁵⁰ Ramachandran, "Addressing Africa's Infrastructure Crisis," October 7, 2008; UNECA, *Economic Report on Africa 2004*, 2004, 126.

⁵¹ Industry officials, interviews by Commission staff, Mombasa, Kenya, October 28, 2008, Nairobi, Kenya, October 29, 2008, and Kigali, Rwanda, November 3, 2008.

they used their own generators exclusively for all production processes, reserving grid-supplied electricity for operations unrelated to production.⁵²

Overall, electricity is inaccessible to more than 80 percent of the population in many SSA countries.⁵³ Most businesses outside major cities lack access to electricity through a national grid. Insufficient access to electricity increases the cost of establishing businesses that could sell products and services to existing export firms or become exporters themselves.

Efforts to Improve the Electricity Sector

Nature and Objectives of Electricity Sector Reforms

Historically, electric utilities in SSA operated as branches of the government singularly responsible for the provision of electricity generation, transmission, and distribution. Today, most SSA electric utilities operate as government-owned companies directed by government-appointed boards. Few governments in the region have reformed or privatized their electricity sector to the extent that governments have in other world regions.

Beginning in 1993, major multinational lending institutions led by the World Bank adopted a policy of lending in the electricity sector only where national governments instituted legislative, regulatory, and/or structural reforms in the sector based on long-term, coherent planning, priorities, and policies. International lenders determined that, overall, government ownership and management of the electricity sector had been poorly conceived and exercised and that it operated without regard for commercial principles. Lenders sought reforms whereby governments would engage in a process to improve electric utilities significantly and to transform the ownership and management of a state-owned electric utility in order to attract more investment and expertise into the sector. Reforms would encourage competition in electricity generation and distribution where economically feasible, while recognizing that competition is not technically or economically justifiable in electricity transmission.⁵⁴ Moreover, lender-initiated reforms generally support regulatory transparency, independence, and impartiality with regard to providers and consumers of electricity.⁵⁵

More than four-fifths of SSA governments have instituted sector reforms to some degree. The principal goals of reforms undertaken thus far in the region were to increase the financial viability of state-owned electric utilities, to attract investment needed to substantially increase electricity generation, and, in some cases, to provide electricity to underserved populations.⁵⁶ About two-thirds of the countries converted their electric utilities into companies, which for the most part are directed by boards appointed by the government, but remain government owned. SSA governments mostly retained vertically

⁵² Industry official, interview by Commission staff, Abidjan, Côte d'Ivoire, October 31, 2008.

⁵³ OECD, IEA, *World Energy Outlook 2006*, 2006, 565–69. In a few countries, however, such as Côte d'Ivoire, Mauritius, and South Africa, as much as 50 percent of the population has access to electricity.

⁵⁴ UNECA, "Utility Regulation in Africa," November 2007, 4. In general, governments require that electricity transmission remains a monopoly, due to the prohibitive cost and the impracticality of duplicating transmission infrastructure spanning vast territory.

⁵⁵ UNECA, *Economic Report on Africa 2004*, 2004, 133–34.

⁵⁶ UNECA and UN-Energy/Africa, "Energy for Sustainable Development," May 2007, 58.

integrated companies, in contrast to the tendency of governments in other regions to create separate companies for each function in the sector as a means to instill competition in generation and/or distribution. Exceptions include the governments of Uganda and Zimbabwe, which unbundled all three functions in separate companies, and the governments of Ghana, Kenya, Lesotho, and Mozambique, which split the three functions among two companies. Generally, the rationale for unbundling was to encourage competition and investment in generation, although most of the separated companies remain government owned.⁵⁷

Few governments in SSA have taken major steps to privatize state-owned electricity assets in generation and distribution. As initial steps, governments in about six countries in East and West Africa have entered into management contracts with consultants in an effort to improve their utilities' performance. Côte d'Ivoire awarded a second consecutive 15-year concession to operate and manage its state-owned power company upon conclusion of the first concession in 2005. Actual private ownership of parts of the state-owned electricity sector in SSA is rare but exists, for example, in Cameroon. However, two attempts by Senegal to privatize its state-owned electricity utility ended without success.⁵⁸

An important aspect of reform is the effect on electricity rates. In many SSA countries electricity rates are high, but in certain countries they are kept artificially low through a subsidy. In several SSA countries, electricity legislation and regulations provided for, and encouraged participation by, IPPs in generation, in part by facilitating higher rates on electricity for consumers, including businesses. Rate increases reflected IPPs' use of increasingly expensive fossil fuel to generate electricity, especially to cover periods of extraordinary peak demand or disruptions in the supply of electricity from other fuel sources. In certain instances, rates were increased to compensate IPPs for the limited time in which to recover investment costs and earn a return on investment. In certain other countries, however, regulators or government ministries set rates too low to attract investment from IPPs, because governments set a higher priority on keeping rates affordable than on recovering actual costs of providing electricity.⁵⁹

About one-half of SSA governments have established a regulator for electricity. Multilateral lenders regard the extent to which the regulator is independent as an important benchmark in evaluating the efficacy of electricity sector reform.⁶⁰ In general, the ability of regulatory agencies in SSA to make final decisions on electricity rates independent of government or other party influences varies in SSA.⁶¹ Another indicator of independence is the degree to which the process used by heads of state or ministers to appoint members of the regulatory body is transparent and consultative. By this measure, there are relatively few fully autonomous electricity sector regulatory agencies in SSA.⁶² Regulatory agencies in many countries are new, sparsely funded, and have limited expertise and training. Industry representatives note that problems with regulatory

⁵⁷ UNECA and UNEP, *Making Africa's Power Sector Sustainable*, September 2007, 63–65.

⁵⁸ Prasad, "Energy Sector Reform," March 2006, 30. In the first case, a public-private partnership ended after investment objectives for generation could not be met and further deterioration of electricity sector infrastructure occurred, resulting in load-shedding. In the second attempt, negotiations over a tender offer failed.

⁵⁹ UNECA and UNEP, *Making Africa's Power Sector Sustainable*, September 2007, 67.

⁶⁰ UNECA, *Economic Report on Africa 2004*, 2004, 142; UNECA "Utility Regulation in Africa," November 2007, 6, 7, 14.

⁶¹ UNECA, "Utility Regulation in Africa," November 2007, 2.

⁶² UNECA and UNEP, *Making Africa's Power Sector Sustainable*, September 2007, 69–71.

agencies may stem from the government and regulator not establishing clear and consistent electricity sector policies.⁶³

Investment in Electric Power Infrastructure

In 2007, investment surged in electricity infrastructure projects in SSA. Significant increases in financial commitments came from traditional sources and the private sector, and funding commitments from nontraditional sources continued the strong growth pattern of recent years.⁶⁴ Partial-year data for Aug.–Nov. 2008 show that the worldwide financial crisis and other factors slowed the growth of overall infrastructure investment in SSA compared to the same period in 2007, although to a lesser extent than in other developing regions. Higher costs of financing affected a number of these projects, while others were canceled or potentially delayed.⁶⁵

Financial commitments to electric power projects in SSA increased in 2007 over the previous year by 62 percent to \$3.9 billion, including funding from the World Bank and other traditional multinational and bilateral project financiers.⁶⁶ Nevertheless, the World Bank estimated that the electricity sector in SSA requires financing of about \$8.3 billion annually between 2005 and 2015 to upgrade plant and equipment (\$5.2 billion) and to provide for adequate operation and maintenance (\$3.1 billion).⁶⁷ The World Bank is the principal lender and guarantor in the SSA electric power sector. The bank's involvement widened in recent years beyond traditional, individual-country support to include numerous large-scale regional projects to expand generation capacity and to upgrade, extend, and interconnect transmission facilities (table 5.2). Its projects have sought to increase access to electricity and to develop reliable, sustainable, and affordable energy, especially in the poorest and most remote areas. The bank supports efforts to provide technical, financial, and management expertise to governments, electric utilities, and regulatory agencies.⁶⁸ Such efforts enable projects to reach financial or contractual closure sooner and improve financial, operational, and regulatory performance.⁶⁹ In recent years, the African Development Bank (AfDB), the continent's major multinational development bank, has expanded its support of electric power projects. A key example of current projects at least partially funded by the AfDB is the rehabilitation of existing hydropower facilities and the related distribution system overhaul in the DRC.⁷⁰

⁶³ Industry official, interview with Commission staff, Johannesburg, South Africa, October 15, 2008.

⁶⁴ Data on electricity sector investment in SSA in 2008 are not yet available.

⁶⁵ World Bank, PPI Advisory Facility, "Financial Crisis Affecting New Private Infrastructure Projects," undated (accessed January 9, 2009).

⁶⁶ ICA, "Significant Increase in Commitments," July 2008, 1.

⁶⁷ Foster, et al., "Building Bridges," 2008, 26.

⁶⁸ Current examples of the World Bank's capacity-building activities in the sector include developing approaches to increase synergies among government agencies in Burkina Faso, electricity regulatory reforms in Eritrea, improvements in system efficiency and the electric utility's financial standing in Guinea, assessments of options for policy and regulatory frameworks for renewable energy in South Africa, and technical assistance for transmission and distribution efficiency improvements in Zambia.

⁶⁹ Closure occurs when private sponsors make a legally binding commitment to provide funding or services. The definition of financial or contractual closure varies according to the type of private participation. For example, financial closure occurs when equity holders or debt financiers commit to provide or make available full funding on a greenfield project. Contractual closure occurs when a private entity signs a contract that authorizes commencement of management or leased services, or a concession. World Bank, "Methodology," Private Participation in Infrastructure Database, undated (accessed March 27, 2009).

⁷⁰ Other important AfDB involvement includes the Bujagali transmission interconnection project in Uganda, the Zambia–Tanzania–Kenya interconnection project to link Tanzania and Kenya to the Southern African Power Pool (SAPP), and generation projects in Mozambique and Tanzania.

Table 5.2 Select infrastructure investments in SSA electricity generation projects

Country/region	Investment	Major stakeholder(s)
Country:		
Botswana	Develop coal mining and coal-fired electricity plant at Mmamabula to generate up to 4,200 MW, mostly for export to South Africa	First IPP in Botswana: CIC Energy Corp. (Canada)
	Expand Morupule coal-fired power station from current 132 MW to 1,200 MW	Botswana Power Corporation or government of Botswana, international financial institutions
Democratic Rep. of the Congo (DRC)	Refurbish hydroelectric plants (Inga 1 and 2, others)	African Development Bank
Ghana	Make grants to developers of renewable energy technologies to electrify rural areas	World Bank, government of Ghana, Volta River Authority, Electric Company of Ghana
Kenya	Expand capacity of existing hydroelectric plants	Kenya Electricity Generating Company (KENGEN)
	Expand capacity at existing geothermal generation plants and develop new plants at sites under evaluation	KENGEN, World Bank, European Investment Bank, government of Kenya
Mozambique	Expand capacity of existing Cahora Bassa hydroelectric plant and develop new hydroelectric plants	Various, including Ex-Im Bank (China)
	Develop coal mining and coal-fired electricity plant at Moatize coal field	
Nigeria	Construct country's largest hydroelectric plant (2,600 MW)	Government of Nigeria, Ex-Im Bank (China)
	Refurbish dams and design and build various sized hydroelectric dams	Government of Germany and German firms, Aqua Energy (Norway)
Uganda	Develop 250 MW of hydroelectric power capacity at new plant (Bujagali)	Sithe Global Power (U.S.), government of Uganda, World Bank
Region:		
Angola, Botswana, DRC, Namibia, and South Africa	Develop 3,500 MW of new hydroelectric plant capacity (Inga 3 in the DRC)	Western Power Corridor (WESTCOR), a joint-venture company owned by the electric utility companies of the five countries
Burundi, Rwanda, and Tanzania	Develop hydroelectric generation capacity at Rusumo Falls on the Rwanda–Tanzania border, and related transmission infrastructure for interconnection among the three countries (key project to eventually link the East African Community to the Southern African Power Pool)	World Bank

TABLE 5.2 Select infrastructure investments in SSA electricity generation projects—*Continued*

Country/region	Investment	Major stakeholder(s)
Ethiopia, Kenya, and Uganda	Jointly develop hydroelectric plants to be established in Ethiopia and Uganda, with portions of electricity to supply Kenya	Governments and electricity companies of the three countries

Sources: Ekanem, “Nigeria: Manufacturing Under Stress,” October 2008, 75; Corporate Council on Africa (CCA), “Projects in the Pipeline,” October 6–8, 2008, 1–13; Cuambe, “Workshop: Large Project Finance,” February 7, 2008; Ex-Im Bank, “Power Projects in Africa,” April 17–18, 2008; and Foster, et al., “Building Bridges,” 2008, 65–66.

Financing for electricity infrastructure projects in SSA changed substantially in recent years with increased participation from nontraditional sources, especially China but also India⁷¹ and Middle Eastern countries.⁷² Africa supplies approximately 30 percent of China’s oil imports and certain electric power projects financed by the government of China are secured by promises to supply additional petroleum to China. Chinese investment is often linked to natural resource development in SSA (box 5.1). For example, a China-financed hydroelectric power facility construction project will provide electricity to Chinese-owned mining operations in Guinea.

Until recently, reported private participation in electricity infrastructure projects in SSA was minimal. From 1990 through 2007, less than one-half of the countries reported more than one such project with private participation.⁷³ From 1990 through 2005, only a few countries reported investment commitments totaling more than several hundred million dollars. Before 2007, only Cameroon reached contractual closure on an electric power project valued at more than \$500 million that involved a private-sector participant—its 2001, \$532 million, 20-year concession to power corporation AES (U.S.).

In 2007, however, the largest private-equity holding in an electric power sector project in SSA reached financial closure. Uganda finalized financing on new generation facilities, including the 250 MW Bujagali hydropower plant, awarded under a 30-year build-operate-transfer contract to a consortium led by Sithe Global Power (U.S.), which holds a 58 percent stake⁷⁴ in the \$799 million investment commitment.

⁷¹ Investments by India’s Ex-Im Bank chiefly involve a multibillion-dollar deal to build an oil refinery and power plant in Nigeria, and construction of an oil pipeline and four combined cycle power plants and an associated transmission system in Sudan. India purchased oil exploration rights in the region as well, which illustrates an approach similar to that of China concerning participation in natural resource development in Africa.

⁷² From 2001 through 2007, Middle Eastern country donors participated mostly in relatively small electricity projects that together totaled about \$3.6 billion. The projects are located in many SSA countries, especially ones with sizable Islamic populations. Usually, multiple Middle Eastern donor agencies combine resources to finance electricity projects, such as a hydropower project in Sudan, in which China’s Ex-Im Bank also participated.

⁷³ Fifteen countries in the region reported no electricity infrastructure projects involving private participation and 12 additional countries reported only one.

⁷⁴ The Aga Khan Fund of Switzerland holds a 31 percent stake.

BOX 5.1 China's Investments in Electricity Infrastructure in Sub-Saharan Africa

From 2001 through 2007, China channeled one-third of its investments in SSA's infrastructure to electricity projects (the most of any infrastructure sector) chiefly through China's Export-Import (Ex-Im) Bank. These Chinese investments mainly provide for Chinese firms to construct dams and related hydroelectric plants that increase generation capacity. During this period, China invested \$5.3 billion in electricity projects in 16 SSA countries, with \$3.3 billion invested in 10 hydropower projects in nine countries, which could increase installed generation capacity in the region by 30 percent when completed. Four of the ten projects would more than double the hydroelectricity generation currently installed in the host countries. To date, the principal recipients of Chinese investment in hydropower projects have been Angola, Ethiopia, Nigeria, and Sudan. In addition to hydropower, China invested in the construction of thermal power generation facilities, primarily in Nigeria and Sudan. Apart from generation, China also invested in transmission facility construction projects in Angola and Tanzania. Because OECD member countries have agreed to adhere to a more stringent risk criteria (compared to China) for infrastructure project finance in developing countries,^a China has been able to increase its financial support of electric power and other infrastructure projects in SSA. Nevertheless, collaboration between traditional multilateral donors and China is likely to increase with the signing of memoranda of understanding between China's Ex-Im Bank and the World Bank in 2007 and the AfDB in May 2008, providing for information exchange and the possibility of shared participation in future infrastructure projects. China's participation in electric power projects is widely perceived by African funding sources as complementary to that of traditional multilateral and bilateral sources.^b

^a Government representative, interview by Commission staff, Washington, DC, September 18, 2008.

^b Foster, et al., "Building Bridges," 2008.

Regional Integration Initiatives

Uneven development of available energy resources within countries and regions of SSA exist alongside inefficient and unreliable electricity infrastructure, presenting few viable solutions to many SSA governments individually. Potential solutions increasingly center on regional development of large-scale generation projects and cross-border electricity transmission and distribution infrastructure.⁷⁵ Moreover, regional electric power pools such as the Southern African Power Pool (SAPP), established in 1995,⁷⁶ will likely evolve from current cooperative arrangements to eventually allow for competitive power trading, but not without first solving complex technical, financial, and political issues.⁷⁷ For example, extensive transmission system upgrades, regulatory harmonization, and operational synchronization among utilities in different countries are prerequisites for initiating significant expansion of electricity trading.⁷⁸ Nevertheless, countries have already realized benefits from collaborations within the SAPP, including reduced capital and operations expenditures and lower requirements for reserve margins of electricity at

⁷⁵ Industry and government officials, interviews by Commission staff, Washington, DC, October 7–8, 2008.

⁷⁶ WEC, *The Potential for Regionally Integrated Energy Development*, 2003, 34. The SAPP was the first power pool established anywhere in Africa. The electric utilities of twelve countries are members of the SAPP, which includes companies from the member countries of SADC. The SAPP was established to allow members to coordinate planning and operation of their respective electricity systems, while benefiting from making surplus electric power available to other members on one-day's notice. The SAPP was established during a period when its largest member, South Africa's Eskom, had abundant surplus electric power available, which is no longer the case. Even at its inception, however, the power pool provided a means by which member utilities could provide electricity to other members in the event of emergency power shortages.

⁷⁷ UNECA and UNEP, *Making Africa's Power Sector Sustainable*, September 2007, 73.

⁷⁸ IMF, *Regional Economic Outlook*, April 2008, 90.

hydroelectric and thermal-powered plants.⁷⁹ Power pools also have been formed in West, Central, and East Africa.⁸⁰

Regional economic communities,⁸¹ multilateral financiers,⁸² the Millennium Challenge Corporation, and SSA governments collectively⁸³ have placed a high priority on facilitating large-scale, medium- and long-term projects in the energy sector, including electricity (table 5.2). Further, the long-term plan is to eventually link power pools in several regions. Examples of high-profile projects with regional electricity trade potential include development of the Bujagali Dam and hydroelectric power facilities in Uganda, and the long-proposed, expensive, and complex hydroelectric projects in the DRC currently under consideration. Examples of important transmission interconnection projects in development include facilities between Malawi and Mozambique, Zambia and Namibia, and Ethiopia and Sudan. Other major projects involve new generation and transmission facilities and subsequent interconnections of national grids in Burundi, Rwanda, and Tanzania to enable eventual linkages to power grids in East and southern African countries.⁸⁴

The recently commissioned West African Gas Pipeline is the first commercially operational, high-priority project of ECOWAS in the energy sector. Natural gas provided to member states through the pipeline could be used for electricity generation.⁸⁵ The World Bank estimated that Benin, Ghana, and Togo together could realize a \$500 million savings in fuel costs over 20 years with gas supplied from the pipeline. The project may serve as a model for future large multinational energy initiatives in SSA.⁸⁶

Harmonizing regulatory practices across countries is an important component of establishing viable regional electricity sectors. Formation of the African Forum for Utility Regulators (AFUR) in 2002 began a process to share information, experiences, and expertise.⁸⁷ The AFUR adopted a framework for utility regulation that recommends adherence to seven regulatory principles, including nondiscrimination, promotion of competition, and investor protection.⁸⁸ Further, the recent formation of regional associations of electricity regulators provides an opportunity to focus on regional issues

⁷⁹ UNECA, *Economic Report on Africa 2004*, 2004, 146.

⁸⁰ ICSU, Regional Office for Africa, *Sustainable Energy in Sub-Saharan Africa*, July 2007, 8. The Economic Community of Central African States and the East African Community each established power pools in recent years. In addition, a number of small power pools exist that each involves only a few countries, such as the pool among Burundi, the DRC, and Rwanda.

⁸¹ These include SADC, the East African Community, and ECOWAS.

⁸² These principally include the World Bank Group and the AfDB.

⁸³ CCA, "Projects in the Pipeline," October 6–8, 2008. For example, the governments of Kenya, Tanzania, and Zambia are financing a project to provide electricity in rural areas by interconnecting power grids through newly constructed transmission lines in the three countries.

⁸⁴ Services Group, *Review of the Regulatory Framework*, September 2007; CCA, "Projects in the Pipeline," October 6–8, 2008.

⁸⁵ Long-range plans are underway, in a project funded largely by the World Bank, for two power plants in Ghana to change from crude oil-fired to natural gas-fired electricity generation, using gas supplied from Nigeria through the West African Gas Pipeline.

⁸⁶ UNECA and UN-Energy/Africa, "Energy for Sustainable Development," May 2007, 76.

⁸⁷ Thirty-five African regulatory authorities (including seven as observers) from 26 countries (all but one from SSA) participate in the AFUR. Participating authorities that regulate electricity exclusively or in conjunction with other energy or public utility sectors are from Cameroon, Côte d'Ivoire, Ethiopia, The Gambia, Ghana, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Namibia, Niger, Nigeria, Senegal, South Africa, Sudan, Tanzania, Togo, Uganda, Zambia, and Zimbabwe.

⁸⁸ Information sharing, capacity building, and work toward harmonization on minimum guidelines and regulatory standards are ongoing. In 2003, the AFUR resolved to establish peer reviews among regulators, but no such reviews have occurred.

in the sector and develop common regional regulatory guidelines and standards. AFUR member energy regulators from Kenya, Tanzania, and Uganda agreed in 2008 to form an association for East African Community energy regulators to address regional energy supply challenges. The new association would also endeavor to influence energy policy regionally, especially to enhance opportunities for increasing the use of renewable and alternative energy.⁸⁹ Similarly, the Regional Electricity Regulators Association comprises electricity regulators from member governments of SADC that have established a regulatory body.⁹⁰

⁸⁹ AFUR, “Partnership Initiatives,” July–December 2008, 17–18.

⁹⁰ Services Group, *Review of the Regulatory Framework*, September 2007, 71–72.

Bibliography

- AES Corporation. *Form 10K*. Annual Report to the Securities and Exchange Commission for Year Ended December 31, 2007, March 17, 2008. <http://investor.aes.com>.
- African Forum for Utility Regulators (AFUR). "Partnership Initiatives: A New Regional Regulatory Association in East Africa." *AFUR Bulletin* 2, no. 1 (July–December 2008): 17–18. <http://www.afurnet.org/>.
- Corporate Council on Africa (CCA). "Projects in the Pipeline." Prepared for CCA conference on African infrastructure, Washington, DC, October 6–8, 2008.
- Cuambe, Manuel. "Workshop: Large Project Finance." PowerPoint presentation at conference on large infrastructure finance, Maputo, Mozambique, February 7, 2008. http://www.mcli.co.za/mcli-web/events/2008/07feb2008/PO1_EdM%20presentation_Moz%20Energy%20section%20dev%20plan.pdf.
- Ekanem, Williams. "Nigeria: Manufacturing Under Stress." *African Business*, October 2008.
- Energy Industry Issues Newsletter*. "What Is a Megawatt?" June 24, 2003. In *Alexander's Gas & Oil Connections* 8, no. 14, July 10, 2003. <http://www.gasandoil.com/goc/features/fex32816.htm>.
- Eskom Holdings Limited. *Together, Rising to the Challenge: Annual Report 2008*. Johannesburg, South Africa: Eskom, 2008. http://financialresults.co.za/eskom_ar2008/ar_2008/downloads/eskom_ar2008.pdf.
- Export-Import Bank of the United States (Ex-Im Bank). "Power Projects in Africa." Prepared for the annual conference, Washington, DC, April 17–18, 2008. http://www.exim.gov/products/special/africa/pubs/power_projects_in_africa042008.pdf.
- Foster, Vivien, William Butterfield, Chuan Chen, and Nataliya Pushak. "Building Bridges: China's Growing Role as Infrastructure Financier for Africa." World Bank Public-Private Infrastructure Advisory Facility, 2008.
- Gratwick, Katharine Nawaal, and Anton Eberhard. "An Analysis of Independent Power Projects in Africa: Understanding Development and Investment Outcomes." Working paper prepared for the Management Program in Infrastructure Reform and Regulation, Cape Town, South Africa, October 2007. http://gsbnet.uct.ac.za/MIR/admin/documents/African%20IPP_9_10_2007_16703.pdf.
- . "An Analysis of Independent Power Projects in Africa: Understanding Development and Investment Outcomes." *Development Policy Review* 26, no. 3 (2008): 309–38. <http://www.gsb.uct.ac.za/gsbwebb/mir/documents/AfricanIPPs2008DPR.pdf>.
- Infrastructure Consortium for Africa (ICA). "Power Supply Situation in Africa." Paper prepared for ICA annual meeting, Tokyo, Japan, March 13–14, 2008. http://www.icafrica.org/fileadmin/documents/Tokyo/Background_paper_Power_Supply_situation_in_Africa_FINAL.pdf.

- . “Significant Increase in Commitments to Infrastructure Projects in Africa.” *ICA Newsletter*, no. 7, July 2008. http://www.icafrica.org/fileadmin/documents/july08_Newsletter.pdf.
- International Council for Science (ICSU). Regional Office for Africa. *Sustainable Energy in Sub-Saharan Africa*. Pretoria, South Africa: ICSU, July 2007. http://www.icsuafrica.org/sustainable_energy_rep_2007.pdf.
- International Monetary Fund (IMF). *Regional Economic Outlook: Sub-Saharan Africa*. Washington, DC: IMF, April 2008. <http://www.imf.org/external/pubs/ft/reo/2008/AFR/ENG/sreo0408.htm>.
- Mbogo, Steve. “Africa: Electricity Managers Agree on Uniform Standards.” *Business Daily* (Nairobi), June 25, 2008. <http://allafrica.com/stories/printable/200806251086.html>.
- News24.com*. “Engineer Shortage Causes Havoc,” August 26, 2008. http://www.news24.com/News24/South_Africa/Power_Crisis/0,,2-7-2335_2382896,00.html.
- OECD. International Energy Agency (IEA). *World Energy Outlook 2006*. Paris: OECD/IEA, 2006. <http://www.iea.org/textbase/nppdf/free/2006/weo2006.pdf>.
- . *World Energy Outlook 2002*. Paris: OECD/IEA, 2002. <http://www.iea.org/textbase/nppdf/free/2000/weo2002.pdf>.
- Prasad, Gisela. “Energy Sector Reform and the Pattern of the Poor: Energy Use and Supply, a Four Country Study: Botswana, Ghana, Honduras and Senegal.” World Bank. Energy Sector Management Assistance Program (ESMAP). ESMAP technical paper 095, March 2006. <http://www.esmap.org/filez/pubs/09506EnergyUsePrasadforWeb.pdf>.
- Ramachandran, Vijaya. “Addressing Africa’s Infrastructure Crisis.” Presented at CCA conference on African infrastructure, Washington, DC, October 7, 2008.
- . “Power and Roads for Africa.” Center for Global Development, March 2008. http://www.cgdev.org/files/15659_file_AfricaPowerRoads.pdf.
- . Written testimony submitted to the U.S. International Trade Commission in connection with inv. no. 332-477, *Sub-Saharan Africa: Effects of Infrastructure Conditions on Export Competitiveness, Third Annual Report*, October 27, 2008.
- Redwood-Sawyer, Jonas A.S. “Widening Access in the Context of Power Sector Reform: An Overview of the Institutional Challenges in Africa.” Paper prepared for UNEP-IEA meeting, Paris, France, May 21–22, 2002. <http://www.unepiso.org/SectorReform/InstitutChallengesAfrica.pdf>.
- Richards, Timothy J. General Electric Company. Written testimony submitted to the U.S. International Trade Commission in connection with inv. no. 332-477, *Sub-Saharan Africa: Effects of Infrastructure Conditions on Export Competitiveness, Third Annual Report*, October 28, 2008.
- Services Group. *Review of the Regulatory Framework for Power Generation and Distribution in Southern Africa*. Prepared for the U.S. Agency for International Development/Southern Africa. Gaborone, Botswana, September 2007. <http://www.satradehub.org/assets/files/Reg%20Framework%20for%20Power%20and%20Generation.pdf>.

- South African Institution of Civil Engineering (SAICE). “The SAICE Infrastructure Report Card for South Africa: 2006.” <http://www.civils.org.za/Portals/0/pdf/publications/saice-reportcard.pdf>.
- UNECA. *Economic Report on Africa 2004: Unlocking Africa’s Trade Potential*. “Chapter 4: Poor Energy Infrastructure Hobbles Export Diversification.” Addis Ababa, Ethiopia: UN, ECA, 2004. <http://www.uneca.org/era2004/>.
- . *Report on Strategies for Promoting Accessibility and Accountability in Public Service Delivery: Utility Regulation in Africa*. Prepared for fourth meeting of the Committee on Human Development and Civil Society. Addis Ababa, Ethiopia, November 22–23, 2007. E/ECA/CHDCS.4/4, November 2007. <http://www.uneca.org/chdcs/chdcs4/Report-Utility-regulation.pdf>.
- UNECA and UN-Energy/Africa. *Energy for Sustainable Development: Policy Options for Africa*. Prepared for Commission on Sustainable Development session no. 15, New York, NY, May 2007. http://www.uneca.org/eca_resources/Publications/UNEA-Publication-toCSD15.pdf.
- UNECA and UN Environment Program (UNEP). *Making Africa’s Power Sector Sustainable: An Analysis of Power Sector Reforms in Africa*. Addis Ababa, Ethiopia, September 2007. http://www.uneca.org/eca_programmes/nrid/pubs/PowerSectorReport.pdf.
- University of Ghana. Resource Center for Energy Economics and Regulation. *Guide to Electric Power in Ghana*. First edition, July 2005. http://www.beg.utexas.edu/energyecon/IDA/USAID/RC/Guide_to_Electric%20Power_in_Ghana.pdf.
- U.S. Department of State. U.S. Embassy, Nairobi. “Kenya Confronts Its Energy Crisis (NAIROBI 002381),” October 17, 2008.
- World Bank. Public-Private Infrastructure (PPI) Advisory Facility. “Financial Crisis Affecting New Private Infrastructure Projects,” undated. <http://www.ppiaf.org/content/view/full/506/462/> (accessed January 9, 2009).
- . “Investment Commitments to Energy Doubled in 2007.” PPI data update note 11, October 2008. <http://ppi.worldbank.org/features/Oct2008/2007EnergyDataLaunch.pdf>.
- . “Methodology.” Private Participation in Infrastructure Database, updated October 2008. http://ppi.worldbank.org/resources/ppi_methodology.aspx.
- . “Private Activity in Energy Remained Stable in 2006.” PPI data update note 6, November 2007. <http://ppi.worldbank.org/features/Nov2007/2006EnergyDataLaunch.pdf>.
- World Energy Council (WEC). *The Potential for Regionally Integrated Energy Development in Africa: A Discussion Document*. London: World Energy Council, 2003. <http://www.gm.undp.org/Reports/The%20Potential%20for%20energy%20devt%20in%20Africa.pdf>.
- WTO. Council for Trade in Services. “Energy Services: Background Note by the Secretariat.” S/C/W/52, September 9, 1998.

CHAPTER 6

Effects of Infrastructure Conditions on the Export Competitiveness of Select SSA Industries

Conditions in land transport, maritime transport, and electricity infrastructure sectors, as discussed in chapters 3 through 5, can have a considerable effect on the ability of firms to produce and export products and services competitively in regional and global export markets. This chapter examines the effects of these infrastructure conditions on the export competitiveness of the following industries in SSA: coffee, shea butter, and certain tropical fruit (pineapples and bananas) in the agricultural sector; natural rubber and related downstream products, textiles and apparel, and leather in the manufacturing sector; and tourism services in the services sector.

The case studies that follow in this chapter examine the effects of infrastructure conditions along the various stages of the supply and value chains of most of the select SSA industries noted above;¹ for example, the effects of infrastructure conditions on the direct and indirect costs of acquiring production inputs, on production and product quality, and on exporting goods and services. The case studies do not present a comprehensive comparison of the effects of infrastructure conditions on the export competitiveness of these select industries across all SSA countries; rather the case studies serve to highlight the experiences of specific producers, such as coffee producers in Rwanda or leather producers in Ethiopia, and make comparisons among SSA producers or between SSA producers and other global competitors to the extent possible.

Relatively poor infrastructure conditions are a competitive disadvantage to SSA producers and exporters of goods and services. Poor infrastructure conditions increase costs and can compromise product quality, rendering both merchandise and services exports less competitive vis-à-vis global competitors that may benefit from relatively better infrastructure conditions. Relatively poor conditions in land transport and maritime transport infrastructure in SSA countries not only increase transportation costs and transit times for goods destined for export, but also increase the costs and length of time for importing needed production inputs such as textiles for apparel production in Kenya or chemicals for leather production in Ethiopia. In addition to increasing transportation costs, poorly maintained road networks can also disrupt delivery schedules and compromise product quality—particularly for perishable items, such as tropical fruit—leading to missed deliveries, higher rejection rates, and lower financial returns to producers. Road congestion can inhibit the expansion of tourism, as traffic can deter tourists from venturing (and spending money) beyond resort areas. Because of inadequate or unreliable grid electricity throughout much of SSA, expensive on-site power generators are often used to maintain production schedules. As a result, overall production costs are often higher, reducing the cost competitiveness of SSA producers. Other factors, such as lack of access to affordable capital, geographic distance to major

¹ Because the textiles and apparel industries are two distinct industries, the discussion of infrastructure conditions on the export competitiveness of these industries is organized by infrastructure sector. The discussion of infrastructure conditions on the export competitiveness of tourism exports does not follow the same organizational structure as that for merchandise exports because of the nature of service exports.

markets, political instability, and certain government policies can amplify the negative effects of poor infrastructure conditions on the export competitiveness of SSA producers.

Summary of Findings

Poor infrastructure conditions in SSA compound the challenges faced by longtime East African² coffee producers attempting to compete in higher-value specialty coffee markets. Inadequate and poor quality roads in some East African countries increase transport costs and compromise bean quality, resulting in lower returns to producers. Inadequate, unreliable, and costly electricity limits the ability to wash coffee, a value-added process that requires electricity to pump clean water. As a result, most coffee produced in and exported from SSA continues to be used in mass-produced, lower-priced blended coffees. Some East African countries, however, have been able to achieve higher returns in recent years despite these infrastructure constraints. In particular, by focusing on quality improvements that increase the appeal of its coffee to international buyers, Rwanda has achieved greater returns and improved its export competitiveness by increasing production and exports of higher-value specialty coffees.

Introduction

Unlike the large coffee plantations in Latin America, smaller farms in East Africa, averaging only 1 to 2 hectares³ of land, produce the majority of East African coffee.⁴ Because virtually all East African agriculture is rain fed⁵ and uses few purchased inputs, coffee production can be subject to a high degree of variability both in terms of volume and quality from year to year.⁶

Ethiopia, Uganda, Côte d'Ivoire, and Kenya are among the largest coffee producing and exporting countries in SSA. For these and a few other East African countries (e.g., Rwanda and Tanzania), coffee exports have been a major source of foreign exchange and represent a significant share of total exports.⁷ East African coffee producers benefited from an extended rebound in world coffee prices during the 2002–08 period, which contributed to increased export earnings.⁸ Because these countries are relatively small producers (figure 6.1), East African coffee production has little influence on world coffee prices and is periodically affected by price volatility. The EU is the largest export market for SSA coffee (figure 6.2).

² This case study focuses on the East African region because it is the largest coffee producing and exporting region in SSA. In 2007–08, East Africa (Ethiopia, Kenya, Rwanda, Tanzania, and Uganda) accounted for 70 percent of SSA's total coffee production and 67 percent of its exports. USDA, FAS, Production, Supply, and Distribution Online Database (accessed January 15, 2009).

³ One hectare equals approximately 2.5 acres.

⁴ Lewin, Giovannucci, and Varangis, *Coffee Markets*, 2004, 1.

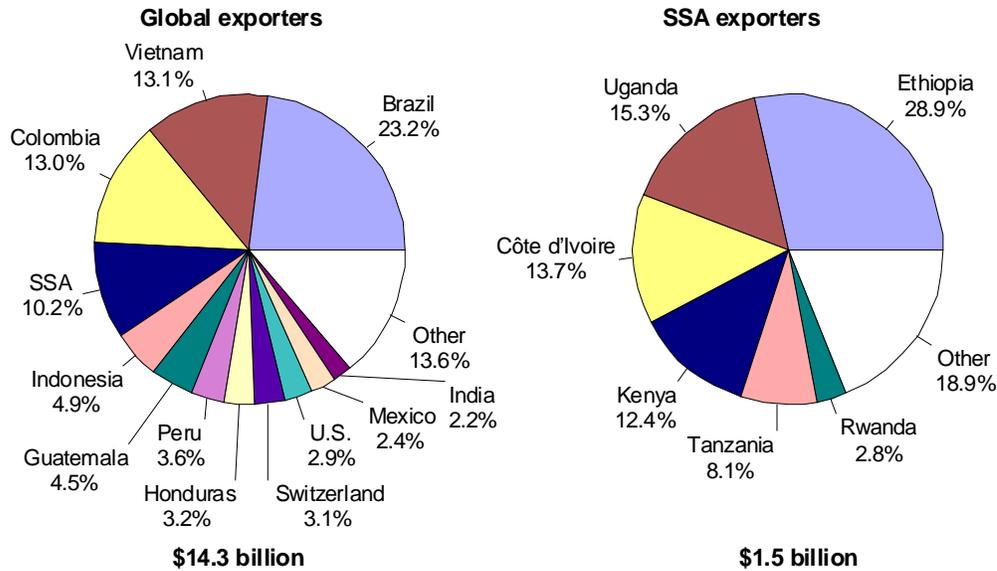
⁵ Rain fed is defined as growing crops under conditions of natural rainfall rather than using manmade irrigation systems.

⁶ USITC, *Sub-Saharan Africa*, 2008, 2-4.

⁷ Côte d'Ivoire is the third largest producer and exporter of coffee in SSA. However, because of the relatively greater importance of cocoa to its economy, coffee export revenue is less significant to Côte d'Ivoire than to other SSA countries, such as Ethiopia and Uganda.

⁸ As noted in USITC, *Sub-Saharan Africa*, 2008, factors contributing to growth in SSA coffee exports in recent years include price increases and demand growth, ongoing liberalization of SSA coffee sectors, and success in differentiating coffee from a homogenous commodity through quality attributes, geographic origin, and method of production.

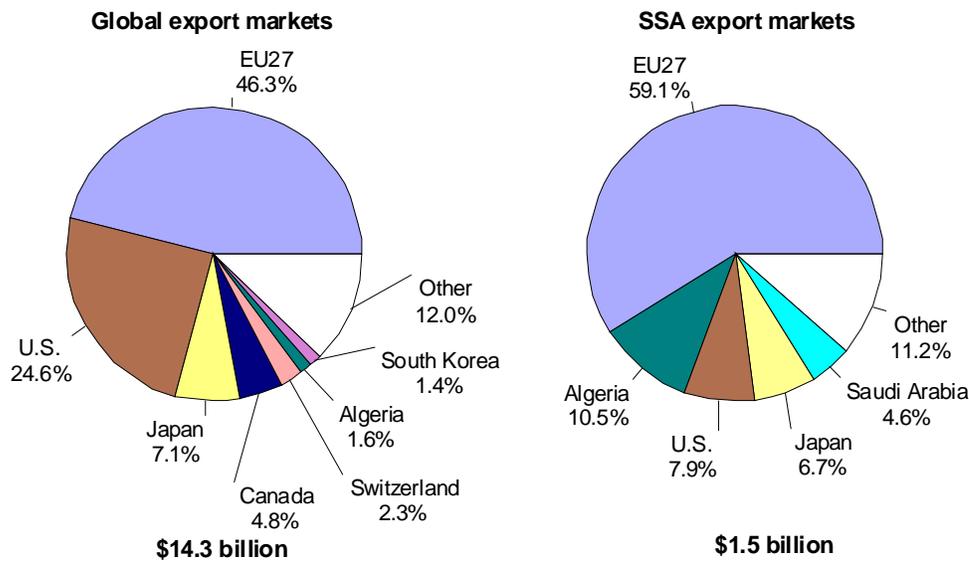
FIGURE 6.1 Leading global and SSA exporters of coffee, 2007



Source: GTIS, Global Trade Atlas Database. Annual data compiled from reporting countries' official statistics, including EU external trade.

Note: Data may not equal 100 percent due to rounding. Includes exports of both unroasted and roasted or further processed coffee.

FIGURE 6.2 Leading markets for global and SSA exports of coffee, 2007



Source: GTIS, Global Trade Atlas Database. Annual data compiled from reporting countries' official statistics, including EU external trade.

Note: Data may not equal 100 percent due to rounding.

Effects of Infrastructure Conditions on the Competitiveness of SSA Exports of Coffee

Poor infrastructure conditions in East Africa often negatively affect coffee quality and lower producer returns. Poor road quality, or lack of adequate road networks, increases transportation times, which can negatively affect coffee bean quality. Expensive and unreliable electricity increases production costs and disrupts coffee washing, a value-added process that relies on water pumps to deliver clean water. Other challenges faced by East African coffee producers include the lack of available credit, inexperienced management, and insufficient Internet access and communication technologies

From Harvest to Collection

Coffee growing in East Africa uses few purchased inputs, making infrastructure conditions less critical at the initial (production through harvesting) stages than at subsequent stages along the coffee value chain.⁹ Infrastructure conditions can significantly affect the ability to transport coffee from harvest locations to collection and processing points. Because most East African coffee farms are small, production of enough exportable green (unroasted) coffee to fill one shipping container may require the collective output of several hundred farms. The collection of coffee therefore presents a massive logistical undertaking.¹⁰

Lengthy transit times negatively affect the quality of the coffee bean because coffee quality rapidly deteriorates between harvesting and processing due to sugar fermentation in the raw coffee cherry. Within 20 hours after harvest, this fermentation can ultimately result in an unpleasant taste to the coffee.¹¹ Therefore, farmers who can reduce transit times are able to sell a higher-quality product and improve their financial returns. Poor-quality feeder roads can increase transportation delays to central collection points or to cooperatives,¹² although the degree to which road conditions affect transportation varies by country.¹³ Furthermore, vehicles are often not used for these deliveries. In Ethiopia, farmers haul coffee loads on horses and mules,¹⁴ whereas in Rwanda, hundreds of farmers walk 2 to 4 km from the fields to reach the collection points.¹⁵

Processing

The outer skin of coffee beans, known as the cherry, must be removed before the beans can be dried and roasted. Removal is accomplished either through dry or wet processing with both methods used in East Africa, although the share processed by each method varies by country.¹⁶ When coffee is dry processed, or unwashed, the entire cherry is cleaned and placed on tables or racks to be sun dried before being milled to strip off the

⁹ Some farmers do use chemical inputs for pest and disease control, but fertilizer use is minimal for SSA coffee production. Loveridge, Mpyisi, and Weber, "Farm Level Perspectives," March 2002, 2.

¹⁰ Project Rwanda, "The Coffee Bike," undated (accessed September 9, 2008).

¹¹ Ibid.

¹² USITC, Hearing transcript, October 28, 2008, 55 (testimony of Scott Clark, TechoServe).

¹³ Industry official, interview by USITC staff, Addis Ababa, Ethiopia, November 7, 2008.

¹⁴ U.S. Department of State, U.S. Embassy, Addis Ababa, "USITC Report: Ethiopia's Infrastructure Effects," October 8, 2008, 9.

¹⁵ Project Rwanda, "The Coffee Bike," undated (accessed September 9, 2008).

¹⁶ Kenya and Tanzania wet process the majority of their coffee, while Ethiopia and Rwanda dry process most of their coffee. UNIDO, Regional Office for Ethiopia, Uganda, and Rwanda, "Agro-Industries Development in Ethiopia," 2007, 8.

residue from the beans.¹⁷ Wet processing, or washing through pulping machines, separates the fruit from the bean; the bean is then washed with substantial quantities of clean water to remove the sticky residue, which if left on the bean, can cause it to ferment, reducing its quality and affecting its flavor.¹⁸

Water for wet processing is usually pumped from wells to processing facilities. The electrical supply for these pumps is virtually nonexistent or, at best, inadequate or unreliable in most rural areas of East Africa. Hence, wet processing is far less common in East Africa than in other coffee-producing regions in the world. Where wet processing does occur in East Africa, diesel generators are often used, which increases overall production costs.¹⁹

Coffee prices are based, in part, on the quality of the bean, which varies due to factors such as type, climate, and soil. With proper coffee washing, these intrinsic qualities are better preserved, producing green coffee beans that are homogenous, with fewer defects,²⁰ and that can be sold at higher market prices relative to unwashed coffee.²¹

Transportation for Export

Coffee is a bulk commodity that is usually exported in containers. In East Africa, coffee is typically shipped to ports via poorly maintained roads. In addition, the lack of trucking capacity and port congestion²² also contribute to increased transportation costs and delays, ultimately increasing overall production costs and compromising coffee quality. Because of these factors, the time and cost associated with shipping a container from East Africa, particularly from landlocked countries, are higher compared to other major coffee exporters (table 6.1). In landlocked Ethiopia, for example, the peak season for exporting coffee to the neighboring port of Djibouti coincides with the peak season for importing fertilizers from the same port, resulting in port congestion and delays. In addition, officials confirm that there is insufficient trucking capacity which results in increased fees.²³ Uganda, Africa's second-largest Robusta²⁴ coffee producer, exports more than 75 percent of its coffee through the port of Mombasa, Kenya;²⁵ it can take up to six weeks for coffee shipments to reach the port.²⁶ Although Kenya benefits from its coastal location and its role as a trade hub for the central and eastern Africa region, Kenyan exporters also suffer from port congestion and delays. Poor port management reportedly compounds the problem.²⁷

¹⁷ Ibid.

¹⁸ Schilling and McConnell, "Model for Siting Coffee Washing Stations in Rwanda," July 2004, 10.

¹⁹ USITC, Hearing transcript, October 28, 2008, 55 (testimony of Scott Clark, TechoServe).

²⁰ International Coffee Organization, "Field Processing," undated (accessed January 9, 2009).

²¹ Dougherty, "Rwanda Savors the Rewards of Coffee Production," July 27, 2004.

²² For more information on maritime infrastructure in SSA, see chap. 4 of this report.

²³ Industry official, interview by Commission staff, Addis Ababa, Ethiopia, November 7, 2008.

²⁴ Robusta is the other major species of coffee besides Arabica. Grown in Africa and Brazil, and to a much smaller extent, Central America, Robusta plants are more resistant to pests and disease, and produce more fruits. The caffeine content of Robusta beans is about twice that of Arabica. Robusta is considered inferior tasting to Arabica.

²⁵ *Dow Jones Newswires*, "Uganda Coffee Exports Still Halted by Kenya Violence," January 9, 2008.

²⁶ Baffes, "Restructuring Uganda's Coffee Industry," October 2006, 9.

²⁷ Industry official, interview by Commission staff, Mombasa, Kenya, October 28, 2008.

TABLE 6.1 Exporting costs for coffee-producing countries in East Africa and their major competitors

Indicator	SSA					Brazil	Colombia	Vietnam
	Ethiopia	Kenya	Rwanda	Tanzania	Uganda			
Average time to export (days) ^a	46	29	42	24	39	14	14	24
Cost to export (\$/container) ^b	2,087	2,055	3,275	1,262	3,090	1,240	1,690	734
SSA rank ^c	29	26	40	9	24	(^d)	(^d)	(^d)
Overall rank ^e	152	148	168	103	145	92	96	67

Source: World Bank, Doing Business Online Database (accessed January 12, 2009).

Note: Container refers to a 20-foot-long container for bulk commodities.

^aIncludes the time for obtaining all documents, inland transport, customs clearance and inspections, and port and terminal handling. Does not include ocean transport time.

^bIncludes the cost of obtaining all documents, inland transport, customs clearance and inspection, and port and terminal handling. Includes official costs only; no bribes or tariffs.

^cRankings are based on a simple average of trading across borders indicators, out of 46 SSA economies (Djibouti and Somalia are not included).

^dNot applicable.

^eRankings are based on a simple average of trading across borders indicators, out of 181 economies.

The Rwandan Experience

Rwanda is the ninth-largest producer of Arabica coffee in Africa, with 500,000 small farms averaging less than 1 hectare.²⁸ Although Rwanda is a relatively small, landlocked producer of coffee in East Africa, the coffee industry has attempted to overcome infrastructure constraints and offset associated high costs by focusing on quality improvements to compete in higher-value specialty coffee markets.

Nearly all of Rwanda's exports travel 1,500 km over poor roads through Uganda and Kenya to the port of Mombasa, or to a lesser extent, by road and rail to the port of Dar es Salaam, Tanzania.²⁹ Transportation from production regions to ports can account for up to 40 percent of the total cost of coffee produced in Rwanda.³⁰

Efforts to Overcome Infrastructure Constraints

Cooperatives and coffee washing stations

With assistance from USAID, many coffee farmers in Rwanda have formed cooperatives, which pool farmers' assets and provide them with easier access to technical assistance, marketing advice, and machinery.³¹ Several cooperatives also constructed coffee washing stations with assistance from USAID, other government organizations, and nongovernmental organizations (NGOs).³² These communal stations enable growers to pool their water and electricity costs and gain the value-added from selling washed coffee

²⁸ *Sweet Maria's Coffee Cupping Reviews*, "Africa: Rwanda," undated (accessed September 30, 2008).

²⁹ EIU, *Country Profile 2008: Rwanda*, 2008, 14.

³⁰ Government official, interview by Commission staff, Kigali, Rwanda, November 3, 2008.

³¹ USAID, "Producers Wake Up and Smell the Coffee," July–August 2005.

³² By 2005, 46 washing stations had been constructed. This number increased to 120 by 2007. Boudreaux and Ahluwalia, "Cautiously Optimistic," 2008, 41.

beans. Between 10 and 15 percent of Rwanda's coffee crop is now fully washed and exported as premium-priced gourmet coffee.³³

Washing has improved the stature of Rwanda's coffee in international tasting competitions, which have increased brand awareness of, and price premiums paid for, Rwandan coffee.³⁴ In 2002, Rwanda made its first sale of high-value specialty coffee, which was priced significantly higher than the world commodity-grade benchmark price³⁵ for Arabica coffee.³⁶ In 2003, the Karuba Coffee Cooperative received a USAID grant to construct a washing station, and by 2007, its quality had improved to such an extent that Karuba's coffee placed third out of 138 Rwandan coffees in Rwanda's Golden Cup Competition.³⁷ Improvements in coffee quality have enabled some Rwandan cooperatives to earn higher returns by bypassing traditional market outlets, such as local auctions, and selling directly to coffee buyers in the United States and Europe at premium prices through Internet auctions.³⁸ USAID works with the Specialty Coffee Association of America³⁹ and other groups in operating "cupping competitions" that involve coffee experts who taste selected types of coffee. According to USAID, these cupping competitions have increased demand for Rwandan coffee, resulting in higher prices from online sales.⁴⁰ According to one international coffee buyer, "Rwanda has become Africa's most actively improving coffee country" and its "cooperatives are producing some of the cleanest coffee on the continent."⁴¹

Despite these successes, Rwanda's coffee washing stations remain constrained by a lack of clean water, expensive electricity,⁴² and a lack of trained workers.⁴³ As a result, the majority of Rwandan coffee continues to be sold as commodity grades used in mass-produced, lower-quality blended coffees.

Coffee bike program

Beginning in 2007, Project SPREAD,⁴⁴ a USAID-funded agribusiness project; Project Rwanda, an NGO; and several other NGOs assisted coffee farmers in obtaining custom cargo bikes to transport coffee to washing stations. Since the introduction of the program, transit times have been reduced by two-thirds, to 2–4 hours. Farmers purchase the bikes through a credit program offered within the coffee cooperatives and are able to repay the loans with the additional income they receive as a result of improved coffee quality.⁴⁵ More than 1,800 bikes have been sold thus far to cooperatives in Rwanda.⁴⁶

³³ Government official, interview by Commission staff, Kigali, Rwanda, November 3, 2008.

³⁴ USAID, "Producers Wake Up and Smell the Coffee," July–August 2005.

³⁵ The "C" market on the Intercontinental Exchange (ICE), formerly the New York Board of Trade, serves as the world benchmark price for Arabica coffee. The majority of mass-produced coffee is "C" grade coffee.

³⁶ Project Rwanda, "The Coffee Bike," undated (accessed September 9, 2008). Prices for Rwanda's higher-grade specialty coffee can be 50 to 250 percent above the "C" market prices. Fraser, "Coffee, and Hope, Grow in Rwanda," August 6, 2006.

³⁷ ACDI/VOCA, "Rwandan Coffee Gets High Marks," December 2007.

³⁸ USAID, "Producers Wake Up and Smell the Coffee," July–August 2005.

³⁹ The Specialty Coffee Association of America is an international trade association that develops and promotes specialty coffee by setting and maintaining quality standards for the industry.

⁴⁰ USAID, "Producers Wake Up and Smell the Coffee," July–August 2005.

⁴¹ ACDI/VOCA, "Specialty Coffee," undated (accessed September 9, 2008).

⁴² Industry official, interview by Commission staff, Kigali, Rwanda, November 17, 2008.

⁴³ Industry official, interview by Commission staff, Kigali, Rwanda, November 17, 2008.

⁴⁴ SPREAD is an acronym for "Sustaining Partnerships to Enhance Rural Enterprise."

⁴⁵ Project Rwanda, "The Coffee Bike," undated (accessed September 9, 2008).

⁴⁶ Gottlieb, "Rwanda Project Members Discuss Coffee-Bike," February 22, 2008.

Summary of Findings

Poor road conditions and inadequate access to electricity affect the harvest, collection, and processing of shea in SSA, resulting in inefficient production, quality issues, and increased costs for shea butter producers. These producers face poor infrastructure conditions, exemplified by increased transportation costs, unreliable delivery schedules, and no access to the electrical grid, and receive lower financial returns on their products than shea butter producers with access to adequate road networks and electric power. Improved infrastructure conditions could greatly enhance the overall ability of SSA firms to efficiently produce and export shea butter. Although SSA shea butter producers face limited competition from competing substitutable products,⁴⁸ improved road transport and cost-effective electricity could allow for increased returns to rural shea butter producers and facilitate capital investment to increase productivity or to expand operations in downstream products.

Introduction

Industry Overview⁴⁹

Shea butter is an exotic vegetable fat derived from the nut of the shea fruit and competes on a limited basis with other exotic vegetable fats as an input into the production of cocoa butter equivalents (CBEs) (box 6.1). A small portion of shea butter production competes with a variety of other inputs (e.g., moisturizers and emulsifiers) and end products (e.g., lotions) in the cosmetics and natural products industry.

SSA shea production is dispersed across large rural areas and is characterized by numerous small and micro-enterprises.⁵⁰ Shea butter is produced by extracting the oil from dried shea nuts. Shea nuts are harvested and dried almost exclusively by rural women in SSA as an income-generating activity secondary to traditional farming, such as cotton and grain harvesting. The process of harvesting shea fruit, extracting the nut from the shea fruit, and drying the nut is done manually. Dried nuts can then be sold to large-scale foreign processors, intermediate buyers, or small- to mid-sized SSA processors, which typically use manual or mechanical (hand-, gas-, or electrical-powered) butter extraction techniques. Shea butter can also be extracted manually by the women who harvest the nuts. Shea butter produced in SSA is generally exported in an unrefined state.

⁴⁷ HTS subheadings 1207.99.02 and 1515.90.21 include shea and other nuts, and oils/fat not elsewhere specified or identified, respectively. Other products containing shea butter, including cosmetics, lotions, hair products, and soaps (HTS 3304, HTS 3305.10, HTS 3305.20, and HTS 3401.11.00), do not specify the percentage of shea in the final product. Industry officials have stated in Commission interviews that there is no good source of trade and production data for shea nuts, butter, or downstream products. The best data available for trade and production are based on industry knowledge in SSA.

⁴⁸ Competing products include other exotic vegetable fats derived from the kernels/nuts of sal, mango, illipe, and kokum, but are produced in limited quantities and also face many of the same infrastructure constraints as shea butter.

⁴⁹ For a more detailed overview of the shea butter industry, see USITC, *Sub-Saharan Africa*, 2008, 2-19-2-34.

⁵⁰ An estimated 90 percent of all shea nuts in SSA are harvested in Benin, Burkina Faso, Côte d'Ivoire, Ghana, Guinea, Mali, Nigeria, and Togo. However, production extends across 20 SSA countries from Senegal to Ethiopia.

BOX 6.1 The Cocoa Butter Equivalent (CBE) Market for the Exotic Fats Industries

Chocolate producers use CBEs to reduce input costs and create a more durable and versatile chocolate product. CBEs are produced using a combination of palm oil and exotic vegetable fats, such as those derived from the kernels/nuts of shea, sal, mango, illipe, and kokum.^a The type of exotic fats used can change the desired characteristics of a CBE. Consequently, the end use of a particular CBE determines that CBE's fat blend.

Shea butter is one of the most commonly used exotic fats in CBE production because of its characteristics and the large quantities of shea butter available. When exotic fats are used in CBE production, the choice of fat is determined by the structure of the triglycerides unique to each exotic fat. Typically, exotic fats with the largest percentage of triglycerides that are identical to those found in cocoa butter are preferred. Shea butter (more specifically, shea stearin—the portion of the butter used directly in CBE production) and kokum contain triglyceride levels most similar to those in cocoa butter. Shea butter production also far exceeds the combined total of all other exotic fats suitable for use in CBE production.^b

^a Exotic fats are obtained primarily from the nuts/kernels of trees growing wild in the tropics. Chalfin, *Shea Butter Republic*, 2004, 162.

^b LMC International, Ltd., "The Impact of Directive 2000/26/EC," June 2006.

Large-scale shea butter production outside SSA, primarily in Europe, typically employs a complex chemical process that creates a white, uniform, odorless, refined shea butter suitable for use as an edible fat, emulsifier, or moisturizer. Refined shea butter production in Europe can begin either with the direct processing of the shea nut or unrefined shea butter.

Because shea butter is primarily used as an input for CBE production, a majority of international trade in the shea industry is conducted by a limited number of multinational agrifood oil processors. Because of this concentration, internal business decisions, such as the location of new processing facilities, significantly affect the levels and form in which shea is exported from SSA. Currently, two multinational oil processors export nuts from SSA for processing in overseas facilities, and two other firms have increased SSA shea butter processing capacity.⁵¹

International Trade

Shea nuts and unrefined butter have become important export commodities for several SSA countries.⁵² Shea butter exports have continued to grow as the quality and quantities of shea production have increased in recent years.⁵³ In 2008, the eight major West African producing countries harvested an estimated 560,000 metric tons (mt) of shea nuts, of which approximately 54 percent were destined for export.⁵⁴ Of the products

⁵¹ Loders Croklaan moved to source only shea butter from SSA. Ghana Specialty Fats began producing a refined shea butter (stearin) for export in 2007. Reportedly, four other major oils and fats companies are investigating shea butter production closer to the production of shea nuts. Industry official, e-mail message to Commission staff, August 16, 2008.

⁵² For example, shea is a primary source of foreign exchange for Burkina Faso, after cotton and livestock.

⁵³ Factors contributing to increased export values of shea include rising demand for CBE, increased prices, growing consumer awareness, training and funding for improved production, and increased private sector investment. USITC, *Sub-Saharan Africa*, 2008, 2-19–2-34.

⁵⁴ Estimate for 2008. The remainder is consumed domestically as cooking oil, cosmetics, and building insulation. Industry official, e-mail message to Commission staff, August 16, 2008.

destined for export, approximately 40 percent were exported in the form of shea butter, or the equivalent of 30,000 mt of shea butter, the remainder as shea nuts.⁵⁵

Approximately 80 percent of SSA shea (nuts and unrefined butter) exports are shipped to Europe for processing into refined shea butter.⁵⁶ The well-established European oils and fats industry has experience receiving, de-gumming, refining, and fractionating shea butter, whereas there is limited processing capacity in SSA.⁵⁷ European companies then export refined shea butter and related downstream products, ranging from chocolate bars to cosmetic products. Limited quantities of shea butter are also produced in India and Japan.⁵⁸

Effects of Infrastructure Conditions on the Competitiveness of SSA Exports of Shea Butter

The shea industry in SSA has limited competition outside the region because shea nuts are only grown and harvested in SSA and shea butter has few competitive substitutes. As noted in box 6.1, CBE manufacturers choose which exotic fats to use largely based on quality characteristics and availability, which are superior commercial aspects of shea butter.⁵⁹ Therefore, most SSA shea producers and exporters compete among themselves. At the firm level within SSA, poor road infrastructure, the limited availability and high costs of vehicles for harvesting and shipping, and unreliable and high-cost energy for mechanized shea processing contribute to increased production inefficiencies, poor quality, and increased costs.

Shea Transport to Local Markets

Poorly maintained roads between local villages and central markets disrupt delivery schedules and increase transportation costs, resulting in lower returns to local shea producers. If producers are able to guarantee the delivery date of their shea nuts and butter, they would likely be able to procure a premium price.⁶⁰ Weather conditions, such as the rainy season that coincides with the shea harvest (generally June through September),⁶¹ contribute to poor road conditions and increased travel times. Poor road conditions, combined with higher vehicle repair costs, limit the number of rental vehicles, such as taxis, available to provide transport services to local markets. High vehicle repair

⁵⁵ Calculations based on 3 kilograms of shea nuts per kilogram of shea butter. Industry official, interview by Commission staff, Accra, Ghana, November 1, 2007.

⁵⁶ Unrefined shea butter is thought to have certain natural “healing” properties for skin and hair largely not found in other oils, which makes it highly marketable, especially as consumer awareness of shea butter has grown, creating a niche market for SSA producers. Although most industrial refining removes the healing portion of the shea butter, some techniques have been developed to retain the healing benefits of shea butter, some of which are certified organic. Fintrac Inc., “Buying and Selling Shea Butter,” October 2002.

⁵⁷ Industry official, e-mail message to Commission staff, November 14, 2008.

⁵⁸ India likely produces unrefined shea butter, as most Indian exotic vegetable fats, including domestically produced kokum, are exported to Europe or Japan, the primary locations of most refined processing operations. LMC International, Ltd., “The Impact of Directive 2000/26/EC,” June 2006, 38, 54.

⁵⁹ The volumes of shea nuts harvested in West Africa far exceed total production levels of other exotic fats used in CBE production (sal, mango, illipe, and kokum). Other exotic fats are primarily produced in India and Indonesia (farther from the European fats industry) and face many of the same infrastructure issues as faced by shea butter producers. LMC International, Ltd., “The Impact of Directive 2000/26/EC,” June 2006.

⁶⁰ Industry official, interview by Commission staff, Kasalgu, Ghana, October 21, 2008.

⁶¹ USAID, “Mali Food Security Update,” February 2008; industry official, e-mail message to Commission staff, August 16, 2008.

costs also raise rental rates for those vehicles that are available, increasing the transport costs incurred by shea producers.⁶²

In addition to using taxis, producers without significant access to capital who desire to sell their product at the central market often walk, bike, or rent a donkey cart to transport their shea.⁶³ Buyers in central markets with access to capital often travel to surrounding villages and purchase nuts and butter at a discounted rate reflective of transportation costs that would be otherwise incurred (box 6.2). These buyers generally are more efficient in shea transport due to their ownership of vehicles.⁶⁴ According to one buyer in Burkina Faso, the central market price was approximately twice the local village price, a significant enough differential that it is more cost effective to use his own vehicles for transport rather than pay the high price for nuts brought to the central market.⁶⁵ Buyers are also able to be more selective in their shea nut and butter purchases outside the central market, improving the overall quality of their purchases⁶⁶ and likely resulting in a higher resale price.⁶⁷

BOX 6.2 Effects of Access to Capital on Shea Prices

Buyers with access to capital are able to pre-finance their purchases and buy shea nuts and butter at a discounted rate by paying in cash at the time of purchase. This price concession is possible because shea producers are often willing to sell shea at a discount in order to receive immediate funds and provide for their families^a as other marketing possibilities (e.g., taking shea nuts and butter to nearby markets) are limited or difficult to reach. For example, shea sales generally coincide with the rainy season and the worst feeder road conditions.^b International buyers, accessing capital from their global operations, can often purchase shea nuts at a discount of 20–40 percent of the asking price.^c In contrast, local buyers without such access to capital are required to borrow from other companies or banks or buy on credit, inflating the cost by roughly 30 percent over the asking price.

^a Grain and food supplies are often at their lowest levels for the year during the shea sales period. Grain harvesting begins in October and extends through December. USAID, “Mali Food Security Update,” February 2008; Elias and Carney, “African Shea Butter,” January 1, 2007.

^b The rainy season extends from May through September.

^c Industry official, interview by Commission staff, Accra, Ghana, October 20, 2008.

⁶² Industry official, interview by Commission staff, Kasalgu, Ghana, October 21, 2008.

⁶³ In Ghana, taxis are generally hired, while donkey carts are typically hired in Burkina Faso.

⁶⁴ Industry officials, interviews by Commission staff, Kasalgu, Ghana, October 21, 2008; and Ouagadougou, Burkina Faso, October 23, 2008.

⁶⁵ Industry official, interview by Commission staff, Ouagadougou, Burkina Faso, October 23, 2008.

⁶⁶ Industry official, interview by Commission staff, Ouagadougou, Burkina Faso, October 23, 2008.

⁶⁷ Higher-quality nuts typically yield larger quantities of butter, which is also generally of a higher quality and can be sold at a premium. Reportedly, chocolate companies will stipulate the quality specifications, including free fatty acid content, unsaponifiables, moisture, and impurities, in their contract and will pay less for any product that falls short of stated specifications or even refuse payment. Similarly, cosmetic and pharmaceutical companies will refuse to purchase any product that does not meet their required specifications. Industry official, e-mail message to Commission staff, December 3, 2008.

Shea Butter Production

High electricity costs minimize incentives for investment in machinery to improve the efficiency of shea butter production.⁶⁸ Electricity costs factor into decisions on where processors locate their facilities and what type to build.⁶⁹ For example, three mechanical shea butter factories operate in Ghana, where electricity costs are \$0.09 per kWh.⁷⁰ By contrast, only two semi-mechanical processing facilities operate in Burkina Faso, where electricity costs are \$0.49 per kWh, the highest in the region and among the highest in the world.⁷¹ When electricity costs permit, mechanization of shea butter production can significantly increase processing efficiencies. For example, the largest of the three processing factories in Ghana has seven press screws and a production capacity of 140 mt of unrefined shea butter per day. In comparison, an average-sized women's group⁷² produces 20 mt in a month.⁷³

The power source for mechanical extraction can directly affect the quality of shea butter produced. Although mechanized facilities can be powered by diesel generators, less expensive sources of electrical power are preferred.⁷⁴ Compared with diesel-powered generators, facilities powered by more efficient sources of electricity typically produce a finer and smoother shea butter, resulting in higher yields; a much lower free fatty acid content level, indicating higher quality; and increased financial returns.⁷⁵

Shea Transport for Export

Insufficient road maintenance, poor road conditions, and insufficient supply of transport vehicles increase the cost and time required to transport shea nuts and butter for export from SSA. In addition, overuse of major transportation corridors and excessive delays further contribute to increased costs and time requirements. The limited number of transportation corridors in West Africa and poor road conditions along these corridors increase the real distance and economic costs associated with inland transportation.

For example, the major corridor for shea exports connects the port of Tema, Ghana, with Ouagadougou, Burkina Faso, via Tamale, Ghana (a major shea trading center). Although large quantities of shea butter are produced in western Burkina Faso and more direct routes to the ports of Abidjan, Côte d'Ivoire, and Tema are available, western Burkinabé shea exporters often ship products through Ouagadougou to the northeast to reach Tema because of poor road conditions along the more direct routes. According to one shipper, this detour, which adds approximately 1,500 km to a trip originally only 1,300 km, avoids the nearly impassable roads in northwestern Ghana.⁷⁶ Similarly, Togolese shea exporters generally ship from the port in Lome, Togo, the closest port. However, because of a

⁶⁸ This includes mill machinery, crushers, and kneading machines. Industry official, interview by Commission staff, Ouagadougou, Burkina Faso, October 23, 2008.

⁶⁹ Other factors include political stability and access to raw materials.

⁷⁰ World Bank, *Snapshot Africa*, January 2007.

⁷¹ Industry official, interview by Commission staff, Ouagadougou, Burkina Faso, October 23, 2008.

⁷² Women's groups are cooperative organizations of various sizes that work together to harvest, produce, and sell shea.

⁷³ Industry official, interview by Commission staff, Northern Region, Ghana, October 22, 2008.

⁷⁴ Industry official, interview by Commission staff, Tamale, Ghana, October 22, 2008.

⁷⁵ Electrically powered machinery operates more consistently. Despite some notable benefits for mechanized production of shea butter, the quality is typically lower when compared to smaller manual operations, which are able to sort through nuts and select only those with the right moisture content, quality, and yield potential. Industry official, interview by Commission staff, Northern Region, Ghana, October 22, 2008.

⁷⁶ Industry official, interview by Commission staff, Paga, Ghana, October 22, 2008.

recently collapsed bridge along the primary corridor to the port, and poor road conditions rendering an alternative route impassable, many Togolese exporters must transport shea via Ouagadougou in the north and export through Tema rather than through Lome.⁷⁷ This diversion adds an estimated 1,750 km to a trip that would otherwise be 650 km.⁷⁸

Road congestion, vehicle breakdowns, excessive checkpoints, and border crossings all increase shea transport time. It can take an estimated 2–4 days to travel approximately 1,360 km between Paga at the Ghanaian–Burkinabé border and Tema. Along the way, a driver may be stopped as many as 25 times, when only four checkpoints are officially in place.⁷⁹

⁷⁷ Industry official, interview by Commission staff, Accra, Ghana, October 20, 2008.

⁷⁸ Industry official, interview by Commission staff, Accra, Ghana, October 20, 2008.

⁷⁹ Industry official, interview by Commission staff, Paga, Ghana, October 22, 2008.

Tropical Fruit

Summary of Findings

Infrastructure conditions in SSA have a significant effect on the competitiveness of SSA tropical fruit producers and exporters, particularly smaller producers. Neglected feeder roads, poorly maintained major transport networks, limited cold storage facilities affected by high electricity costs, port inefficiencies, and limited shipping options increase transportation time to market and compromise product quality—the critical competitive factors for perishable fruit with a limited shelf life. As a result, rejection rates by buyers are often higher and returns to SSA producers and exporters are often lower, compared with other global tropical fruit exporters.

Introduction

Industry Overview

Tropical fruit is grown and harvested throughout much of East and West Africa, although West Africa accounts for most SSA exports of tropical fruit. Tropical fruit producers in West Africa are either large, export-oriented plantations, medium-sized local companies, or small-scale out-growers.⁸⁰ Bananas and pineapples account for the overwhelming majority of tropical fruit production in SSA.

Large plantations, such as the banana plantations of Cameroon, Côte d'Ivoire, and Ghana, operate through one ownership group, generally joint ventures between multinationals and local firms or wholly owned subsidiaries of multinational firms. These plantations, usually larger than 500 hectares, often possess their own trucks, packing houses, shipping lines, and distribution networks, and have established relationships with customers in the EU. Large plantations also invest capital in local infrastructure, including road networks surrounding their plantations, in order to maximize efficiency and limit damage to the fruit in transit. Greater access to capital allows larger plantations to operate with improved infrastructure conditions and benefit financially from these investments.

Medium-sized local companies, or farmer-based organizations (FBOs), tend to be managed by comparatively large, centrally located, nucleus farms. In addition to what is produced on-site, FBO operations source, pack, and market fruit from small-scale out-growers. Small out-growers operate farms generally 0.5–10 hectares in size and sell their product to nucleus farms and at local markets via revolving supply contracts, making small out-growers vital to the success of the SSA tropical fruit industry. In turn, out-growers generally receive technical and financial assistance from nucleus farms, thereby increasing their access to training and inputs such as mechanical equipment and seeds.⁸¹

Small out-growers tend to grow pineapples because the initial investment cost of establishing a pineapple farm is relatively low compared to the investment costs needed to grow other fruit, such as bananas.⁸² Recent developments, such as the political uncertainty in Côte d'Ivoire and the shift in consumer preference from the traditional

⁸⁰ Out-growers are small producers at dispersed locations, distinct from centrally located producers, such as larger tropical fruit plantations, with cold storage facilities.

⁸¹ Industry official, interview by Commission staff, Tamale, Ghana, October 21, 2008.

⁸² Minot and Ngigi, "Are Horticultural Exports a Replicable Success Story?" December 1–2, 2003, 36.

Smooth Cayenne pineapple variety to the sweeter, less acidic MD2 variety of pineapple, have spurred a trend toward more plantation-style pineapple production.⁸³

International Trade

In 2007, global exports of pineapples totaled almost \$1.6 billion and were dominated by Central American producers. Pineapple exports from Costa Rica alone were almost seven times larger than those from SSA. Exports of pineapples by SSA countries in 2007 totaled \$152 million, or approximately 10 percent of global exports.⁸⁴ The largest SSA exporters were Côte d'Ivoire, Ghana, and Cameroon (figure 6.3).⁸⁵ Globally, more than three-quarters of pineapple exports are destined for either the EU or the United States; the EU is the largest market for SSA pineapple exports (figure 6.4).

In 2007, global exports of bananas totaled nearly \$7.7 billion, with Central and South America (collectively referred to as Latin America) accounting for the vast majority of that amount. The largest banana producers in SSA export small percentages of their total production, in part because of the distances to ports, poor road infrastructure, and long transport times. SSA exports of bananas in 2007 totaled \$439 million, or approximately 6 percent of global exports (figure 6.5). The largest SSA exporters were Cameroon, Côte d'Ivoire, and Ghana. Almost all SSA exports of bananas are destined for the EU (figure 6.6).

Effects of Infrastructure Conditions on the Competitiveness of SSA Exports of Tropical Fruit

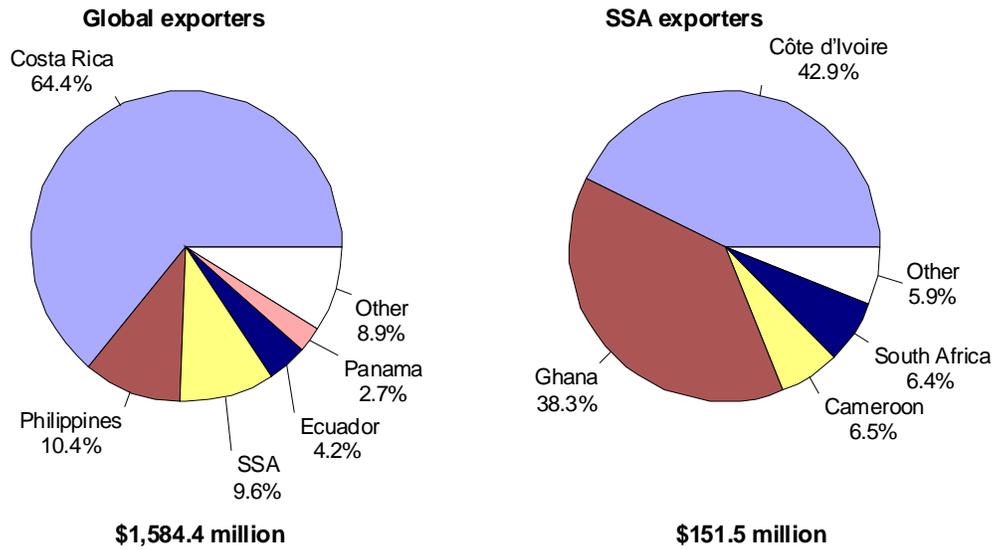
Infrastructure conditions have a significant effect on postharvest treatment of fruit, which affects final product quality and, in turn, the export competitiveness and financial returns of tropical fruit producers. In SSA, poor infrastructure conditions, such as inferior road networks, few cold storage facilities, and less than ideal port operations, facilities, and shipping availability, render production and distribution inefficient, compromising product quality along the entire supply chain. As a result, SSA product is often of lower quality and rejection rates by buyers are often higher than for Latin American competitors.

⁸³ For more information on the transition to the MD2 variety and its impact on the industries in the region, see USITC, *Sub-Saharan Africa*, 2008, 2-48-2-71.

⁸⁴ Factors contributing to shifts in exports of tropical fruits from SSA include demand growth for bananas and pineapples, the development of new pineapple varieties, increased foreign investment, price increases for bananas, assistance from international aid programs, and the development of industry organizations and government support institutions. See USITC, *Sub-Saharan Africa*, 2008, 2-48-2-71.

⁸⁵ The largest SSA producers of pineapples are Nigeria and Kenya, although most pineapples produced in those countries are consumed domestically. FAO, FAO Stat Global Production Database (accessed December 10, 2008).

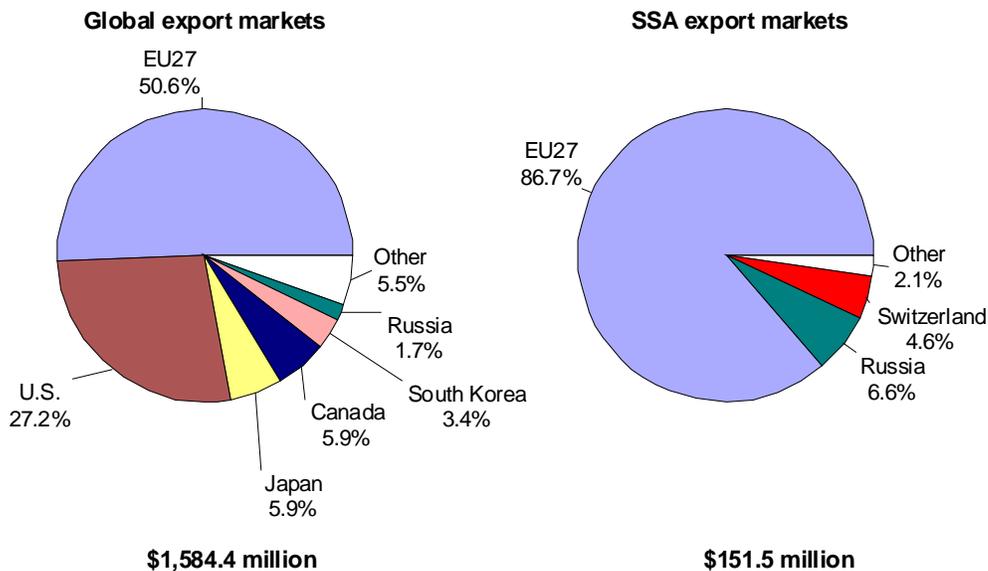
FIGURE 6.3 Leading global and SSA exporters of pineapple, 2007



Source: GTIS, Global Trade Atlas Database. Annual data compiled from reporting countries' official statistics, including EU external trade.

Note: Data may not equal 100 percent due to rounding.

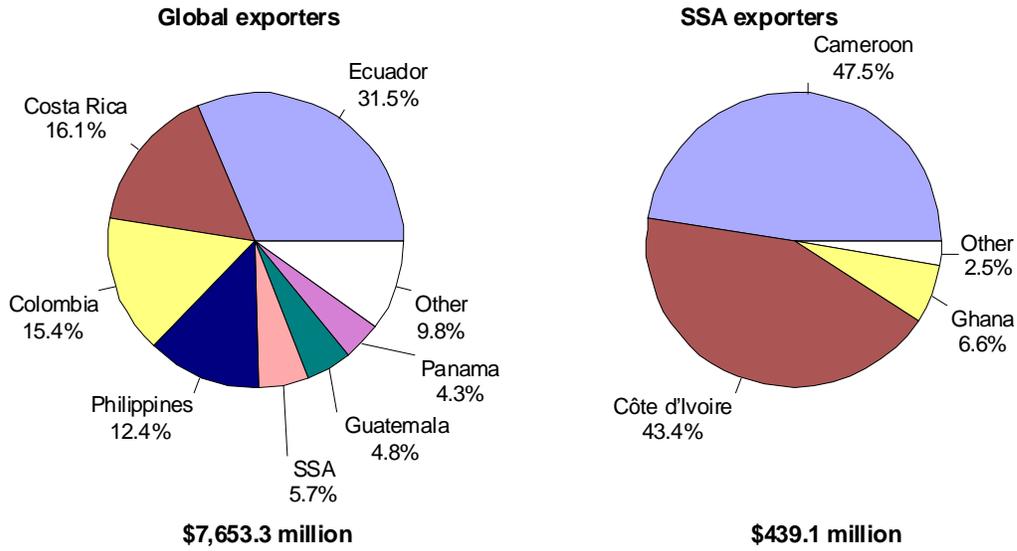
FIGURE 6.4 Leading markets for global and SSA exports of pineapple, 2007



Source: GTIS, Global Trade Atlas Database. Annual data compiled from reporting countries' official statistics, including EU external trade.

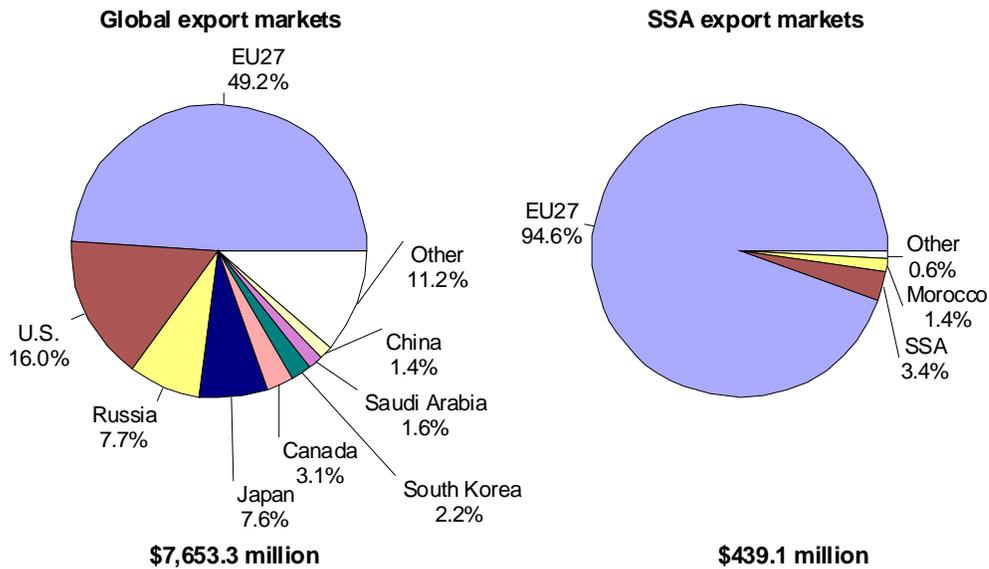
Note: Data may not equal 100 percent due to rounding.

FIGURE 6.5 Leading global and SSA exporters of bananas, 2007



Source: GTIS, Global Trade Atlas Database. Annual data compiled from reporting countries' official statistics, including EU external trade.

FIGURE 6.6 Leading markets for global and SSA exports of bananas, 2007



Source: GTIS, Global Trade Atlas Database. Annual data compiled from reporting countries' official statistics, including EU external trade.

From Harvest to Packing

Out-growers load their tropical fruit harvest into the bed of a truck and transport it over feeder roads in loose, unpackaged form to packing facilities or nucleus farms, where the fruit is placed into cardboard packaging boxes and then precooled. The condition of these feeder roads is critical to maintaining the quality and value of the fruit. The roads are rarely paved and travel speeds are slow, which delays the refrigeration of the fruit and decreases shelf life. This additional time is crucial; industry officials estimate that every hour a pineapple spends in the sun before being cooled is equivalent to one extra day of time onboard a ship in cold storage.⁸⁶ Rutted and potholed feeder roads also damage the fruit during transport. Consequently, when sourcing from out-growers, nucleus farms reject large volumes of fruit during their screening process because the fruit does not meet quality standards; industry officials report that approximately 15 to 20 percent of fruit delivered by out-growers is rejected.⁸⁷

The poor condition of these feeder roads is a competitive disadvantage for most West African producers compared to Latin American competitors. In Latin America, most production occurs on larger plantations that have access to capital and possess other financial advantages. Local governments and the multinational firms that operate these farms have developed and improved road networks in and around these plantations over time through both private and public investment.⁸⁸

Packing, Cold Storage, and Electricity Costs and Connectivity

In addition to the poor quality of feeder roads, the lack of cold storage throughout the supply chain is a significant infrastructure constraint for West African tropical fruit producers. A complete cold-storage supply chain for tropical fruit preserves the quality and increases the value of the fruit by reducing spoilage and extending shelf life. Maximizing shelf life increases export competitiveness and, correspondingly, the prices received in global markets⁸⁹

The lack of cold storage and electric connectivity are critical competitive disadvantages for West African producers. In Costa Rica and other export-oriented countries throughout Latin America, cold storage is maintained throughout the entire supply chain, and as a result, the fruit is more likely to be delivered to customers in optimal condition. Because production usually takes place on larger plantations that have access to capital, producers in Latin America can generally afford to invest in cold storage facilities. Also, these larger farms reportedly are almost always connected to electrical grids, have reliable access to affordable electricity, and therefore have much lower energy costs.⁹⁰

Unlike in Costa Rica, many tropical fruit producers in West Africa are located in more rural areas, far from major road networks and ports, and do not have access to the national electrical grid unless they pay for the installation themselves. The initial investment for connection, which includes the poles, wiring, and transformers, is often prohibitive for producers of all sizes. Transformers alone cost nearly \$300,000.⁹¹ As a result, many producers remain disconnected from the grid.

⁸⁶ Industry official, interview by Commission staff, Accra, Ghana, October 27, 2008.

⁸⁷ Industry official, interview by Commission staff, Tamale, Ghana, October 21, 2008.

⁸⁸ Industry official, telephone interview by Commission staff, December 22, 2008.

⁸⁹ Industry official, interview by Commission staff, Accra, Ghana, October 27, 2008.

⁹⁰ Industry official, telephone interview by Commission staff, December 22, 2008.

⁹¹ Industry official, interview by Commission staff, Accra, Ghana, October 24, 2008.

The large capital investment required to construct cold storage facilities (\$120,000–\$135,000 in most cases), and high electricity costs when operating the facilities, hamper cold-storage facility expansion in the West African region and result in a lack of sufficient cold storage availability throughout the supply chain.⁹² Access to credit is extremely limited, and because most farms operate with low profit margins, they cannot afford to finance these investments on their own. As a result, expansion often depends on external financing or donations from international aid and development groups.

The electrical costs of operating cold storage facilities in West Africa are prohibitive for many smaller-sized tropical fruit producers. Because the electricity distribution systems in Ghana and Côte d’Ivoire experience frequent outages, all packing facilities, even if connected to the electrical grid, rely on backup generators. Although the percentages vary depending on the region, tropical fruit producers connected to the electrical grid in Ghana estimate that they source electricity from their diesel generators more than 30 percent of the time, at a cost that is approximately twice the cost of electricity supplied from the national electric grid.⁹³

Nucleus farms without electric connectivity operate solely on diesel generators, which increase costs substantially. For example, the staff of a nucleus farm that exports relatively small quantities of tropical fruit from northern Ghana estimated that if the farm were connected to the grid and the supply were fairly reliable, its energy costs would decrease by 60 percent or more.⁹⁴ These cost differences apply to large-scale exporters as well. One of the largest tropical fruit exporters in the region estimated that generator power accounts for approximately 15 percent of total costs. If connected to the grid, the exporter estimated that his power costs would decrease by 50 percent, to 7.5 percent of total costs.⁹⁵

Exports of pineapples from independent out-growers have declined substantially as a result of difficulties accessing cold storage facilities. The importance of cold storage increased with the transition to the MD2 pineapple variety because, without cold storage, the new variety’s quality diminishes faster than traditional varieties. As a result, many out-growers have not been able to transition to the MD2 variety because cold storage facilities are not available within a reasonable distance of their farms,⁹⁶ leaving a large number of out-growers without a foreign market for their product.

From Packing to the Port and Beyond

Once harvested tropical fruit arrives at the packing facility, it is sorted and packed in containers and, ideally, precooled. The containers are then placed on trucks that are generally refrigerated and shipped to the port. Congested and poorly maintained roads and numerous checkpoints increase the time and cost of transporting tropical fruit from packing to port, even over short distances. For example, it takes approximately one hour to transport produce from one farm 100 km away from the port of Tema, Ghana, whereas, because of poor transport conditions, it takes approximately three hours to transport

⁹² The industry official estimated a cost of €90,000–100,000, converted to U.S. dollars at a rate of \$1.33 per euro. Out of 26 nucleus farms that comprise the Sea-Freight Pineapple Exporters of Ghana, only 7 had cold storage facilities as of January 2009. Industry official, interview by Commission staff, Accra, Ghana, October 28, 2008.

⁹³ Industry officials, interviews by Commission staff, Accra, Ghana, October 27, 2008; and Awutu Efutu Senya, Ghana, October 28, 2008.

⁹⁴ Industry official, interview by Commission staff, Tamale, Ghana, October 21, 2008.

⁹⁵ Industry official, interview by Commission staff, Accra, Ghana, October 27, 2008.

⁹⁶ Industry official, interview by Commission staff, Awutu Efutu Senya, Ghana, October 28, 2008.

produce from another farm only 70 km from the same port.⁹⁷ If the fruit is being transported in cold storage, then the additional transport time may not affect the fruit quality as dramatically, but entire truckloads of produce can be lost because of poor road conditions. One producer reportedly lost two truckloads of pineapples during a three-month period when his trucks overturned as a result of unstable road conditions.⁹⁸ In contrast, road access in Costa Rica is reportedly more reliable and direct to the port, resulting in lower transport times and fewer vehicular accidents.⁹⁹

Port operations throughout West Africa affect fruit shipment quality and the competitiveness of tropical fruit exports. Tropical fruit exports from West Africa are at a disadvantage in export markets compared to other global competitors because of inefficient or infrequent shipping routes. Poor handling at the port can damage the fruit and lead to higher rejection rates than those experienced by Latin American exporters.

Despite being a comparable distance by sea from the EU, tropical fruit shipped from the largest exporters in Latin America spends less time in transit between ports than tropical fruit shipped from West Africa.¹⁰⁰ Most of the produce exported from Latin America is shipped on dedicated fruit vessels operated by the major global produce companies, such as Dole and Del Monte. Dedicated fruit vessels are available less frequently in West Africa than in Latin America because of limited regular quantities of SSA tropical fruit exports. Therefore, most fruit exports from West Africa are shipped on container vessels, which are less costly than dedicated fruit vessels.¹⁰¹ Latin American producers reportedly benefit from efficient shipping route options to all of the major ports in the EU, with produce often reaching its final EU destination, such as Antwerp, Belgium, in 12 or 13 days.¹⁰² In contrast, some produce exported from West Africa is shipped on container vessels that make other port calls en route and can take around 20 days to arrive at its final EU destination. The additional days in transit lower the fruit's value to a retailer.¹⁰³ In addition, the mishandling of containers can cause damage to the fruit prior to departure. Between 2 and 3 percent of fruit exports from West Africa are reportedly damaged as a result of poor handling at West African ports, compared to an approximate 1 percent damage rate in Latin America.¹⁰⁴

In an attempt to improve fruit quality and compete with other global exporters, West African industry and port operators are constructing portside tropical fruit cold storage facilities. For example, a new fruit handling terminal with expanded cold storage facilities at the port of Tema was completed in October 2008, although it is not yet operational because of delays in concluding an agreement on its operations among the Ghanaian Ministry of Agriculture, the Sea-Freight Pineapple Exporters of Ghana, and the Ports Authority. The expanded facility is expected to increase cold storage capacity and

⁹⁷ Industry official, interview by Commission staff, Accra, Ghana, October 27, 2008.

⁹⁸ Industry official, interview by Commission staff, Awutu Efutu Senya, Ghana, October 28, 2008.

⁹⁹ Industry official, interview by Commission staff, Awutu Efutu Senya, Ghana, October 28, 2008.

¹⁰⁰ For more information on maritime infrastructure in SSA, see chap. 4 of this report.

¹⁰¹ Whereas shipping a reefer container from West Africa to northern Europe can cost approximately \$3,300, shipping the same quantity of tropical fruits in palettes on a dedicated fruit vessel can cost almost twice as much. Industry official, e-mail message to Commission staff, November 20, 2008.

¹⁰² Hapag-Lloyd, "Schedules," undated (accessed December 3, 2008); Dole Ocean Cargo Express, "Sailing Schedules," undated (accessed November 14, 2008).

¹⁰³ Currently, sailing times from Tema, Ghana, to Antwerp, Belgium, can take more than 20 days due to additional port calls in Senegal, Morocco, and Spain. Maersk Line, "Route Schedules by Map-Africa," October 3, 2008.

¹⁰⁴ Industry official, telephone interview by Commission staff, December 22, 2008.

decrease cold storage costs compared to the high rates charged to tropical fruit exporters for storing refrigerated containers at the port.¹⁰⁵

¹⁰⁵ Industry official, e-mail message to Commission staff, September 25, 2008.

Natural Rubber

Summary of Findings

Poor infrastructure conditions and high electricity costs increase production costs and have a negative effect on the competitiveness of SSA exports of natural rubber. They also hinder the ability of SSA countries to expand production and exports of natural rubber and rubber products. With the exception of South Africa, SSA countries have not been successful in manufacturing goods from natural rubber for their domestic or regional export markets. The high price of electricity is the major obstacle to manufacturing downstream rubber products that are cost competitive with imports. However, SSA countries do have some advantages over their primary competitors in Southeast Asia, including abundant, inexpensive land suitable for rubber planting and high productivity of newly planted areas.

Introduction

Industry Overview

Natural rubber is a commodity product collected from the *Hevea brasiliensis* tree, which grows well in warm, wet climates.¹⁰⁶ It is most often collected by small land holders who harvest unprocessed rubber from an area of about 2 to 20 hectares and sell it to nearby processors. Natural rubber is also produced on estates or plantations, usually covering thousands of hectares, where the company owning the land manages the entire rubber production process. An estimated 75 percent of solid rubber is used for the production of tires.¹⁰⁷ Other products made from solid rubber include hoses, seals, conveyor belts, and foam rubber.

Natural rubber production in SSA is concentrated in the equatorial regions of West Africa.¹⁰⁸ Côte d'Ivoire, Liberia, Cameroon, and Nigeria are the largest natural rubber producers and exporters in SSA, together accounting for about 91 percent of SSA natural rubber production and exports.¹⁰⁹ In Côte d'Ivoire, small land holders account for about 61 percent of the area dedicated to rubber production.¹¹⁰ In Liberia, production is dominated by a large estate that has been owned by Firestone Natural Rubber Co., LLC, since 1924.¹¹¹ In Nigeria, small holders account for about 60 percent of the area dedicated to natural rubber production.¹¹²

¹⁰⁶ Baker and Fulton, "Rubber, Natural," 1997, 2. For more information on natural rubber production and factors affecting SSA trade in natural rubber in recent years, see USITC, *Sub-Saharan Africa*, 2008, 3-17-3-30.

¹⁰⁷ USITC, *Sub-Saharan Africa*, 2008, 3-19.

¹⁰⁸ Historically, the DRC was a major exporter of natural rubber. Recently, the DRC's natural rubber production has been greatly reduced because of internal conflict. The DRC's dilapidated transportation infrastructure also hinders the development of natural rubber production. See OECD and AfDB, *African Economic Outlook 2007/2008*, 2008, 244.

¹⁰⁹ IRSG, *Rubber Statistics Bulletin*, table 7, January–February 2008.

¹¹⁰ USITC, *Sub-Saharan Africa*, 2008, 3-20; IRSG, *Rubber Statistics Bulletin*, table 46, January–February 2008.

¹¹¹ *Africa News*, "Liberia: President Issues Executive Order," November 22, 2008. Firestone recently renegotiated the concession for the estate with the Liberian government and has rights to the concession until 2041. *Rubber & Plastic News*, "Houses of Liberian Legislature Ratify Pact," April 14, 2008.

¹¹² IRSG, *Rubber Statistics Bulletin*, table 46, January–February 2008.

Estate production is typically more efficient than small-holder production because estate employees often have better technical knowledge that enables them to produce more natural rubber per hectare.¹¹³ However, government policies in both SSA and Southeast Asia, SSA's closest competitor, tend to favor small holders over large estates.¹¹⁴ Small holders also have more flexibility to switch to different crops or different sources of income when the price of rubber falls because they do not have as much capital invested as the estates.¹¹⁵

International Trade

SSA exports of natural rubber topped \$912 million in 2007, or about 6 percent of global exports that year (figure 6.7). Côte d'Ivoire, Liberia, Cameroon, and Nigeria together accounted for almost 90 percent of SSA exports. In comparison, the world's three largest exporters of natural rubber, all based in Southeast Asia, accounted for 84 percent of global exports that year—more than 13 times the amount of SSA natural rubber exports.

The EU and the United States are the largest markets for SSA natural rubber, together accounting for 88 percent of SSA exports (figure 6.8). About 66 percent of SSA natural rubber exports are for the production of tires in the EU and United States.¹¹⁶ SSA countries shipped little natural rubber to China, the world's largest importer of natural rubber.¹¹⁷

Although SSA lags behind Asian countries in terms of total production and exports of natural rubber, production per hectare in some SSA countries is on par with or exceeds that of Southeast Asian countries. Production per hectare in Côte d'Ivoire and Liberia is higher than or similar to the production levels in the three top Southeast Asian countries (table 6.2). Côte d'Ivoire's productivity advantage over producers in Southeast Asia is attributable to a higher proportion of estate production and the use of superior rubber tree clones.¹¹⁸ Nigeria's production per hectare is substantially lower. Government policies that have focused more on crude petroleum production than on natural rubber production have resulted in a lack of investment to replace old, less productive trees with new seedlings.¹¹⁹ Some of the advantages that West African countries have over Southeast Asian producers are abundant land suitable for plantation development, lower plantation land acquisition cost, higher natural rubber yields, lower corporate taxes, and proximity to European and U.S. markets.¹²⁰

¹¹³ IRSG, "The African Rubber Industry," 2002, 8.

¹¹⁴ Industry official, interview by Commission staff, Anguedou, Côte d'Ivoire, October 31, 2008; IRSG, "The African Rubber Industry," 2002, 14.

¹¹⁵ IRSG, "The African Rubber Industry," 2002, 14.

¹¹⁶ Ibid.

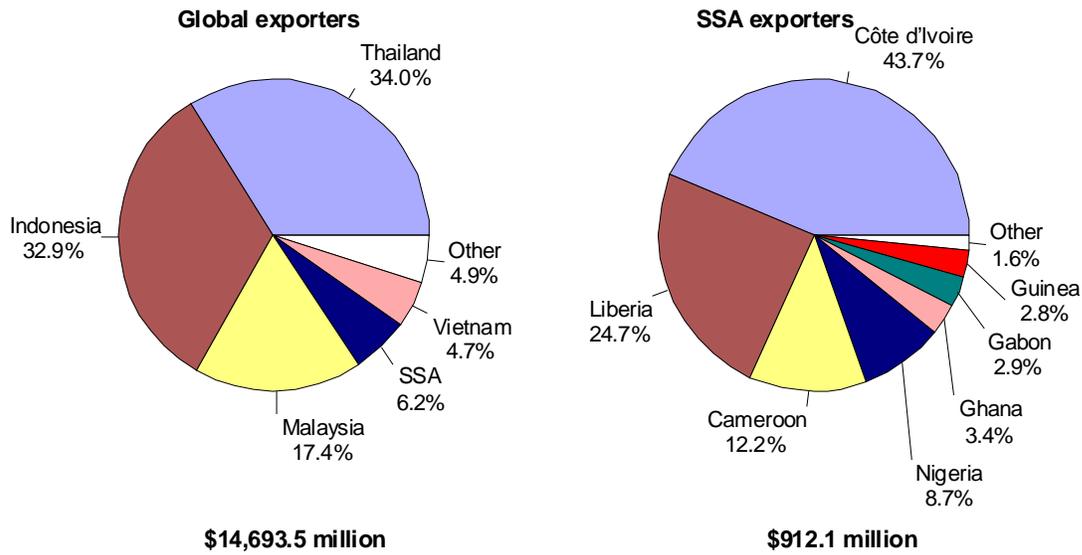
¹¹⁷ However, a Singaporean company, GMG, which owns 90 percent of the Hevecam plantation in Cameroon, wants to expand production at this plantation to supply the Chinese state-owned company Sinochem. Tumanjong, "Sinochem Intl To Be Major Consumer," November 10, 2008.

¹¹⁸ Industry official, interview by Commission staff, Abidjan, Côte d'Ivoire, October 31, 2008.

¹¹⁹ IRSG, "The African Rubber Industry," 2002, 11–12.

¹²⁰ *Business Times* (Singapore), "Olam, Wilmar in 50:50 African Joint Venture," November 16, 2007; Jones, "Vietnam Mulls Africa Rubber Plantations," July 15, 2008.

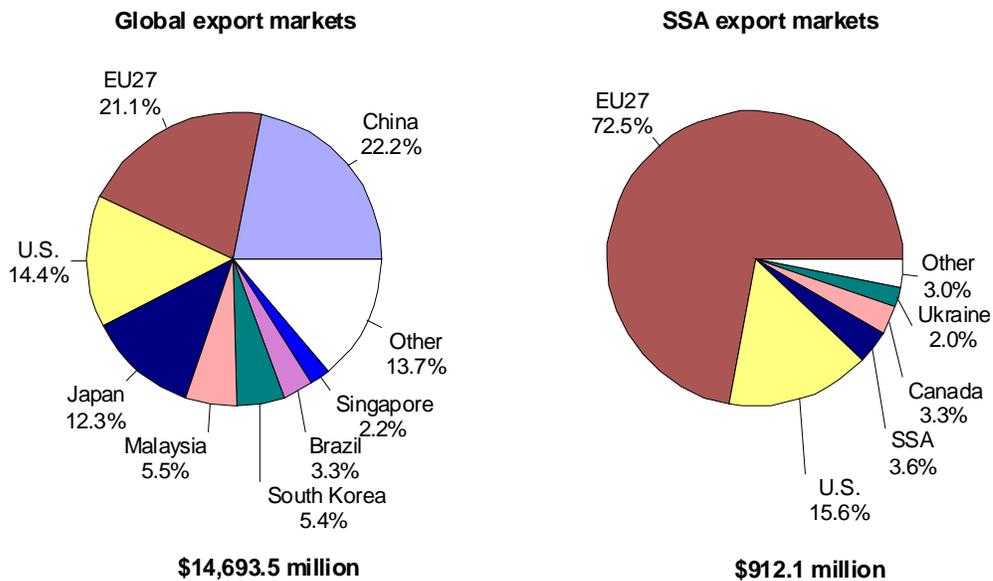
FIGURE 6.7 Leading global and SSA exporters of natural rubber, 2007



Source: GTIS, Global Trade Atlas Database. Annual data compiled from reporting countries' official statistics, including EU external trade.

Note: Data may not equal 100 percent due to rounding.

FIGURE 6.8 Leading markets for global and SSA exports of natural rubber, 2007



Source: GTIS, Global Trade Atlas Database. Annual data compiled from reporting countries' official statistics, including EU external trade.

Note: Data may not equal 100 percent due to rounding.

TABLE 6.2 Natural rubber industry statistics for select West African countries and their major competitors, 2006

Statistic	SSA			Southeast Asia		
	Côte d'Ivoire	Liberia	Nigeria	Thailand	Indonesia	Malaysia
Production of natural rubber ^a (mt)	178,300	100,500	44,000	3,137,000	2,637,000	1,283,000
Rubber producing land area (hectares)	121,700	108,900	150,000	2,294,700	3,309,000	1,225,000
Small landholders (%)	60.7	44.5	60.0	^(b)	84.5	95.5
Productivity (kg per hectare)	1,465	923	293	1,367	797	1,047
Domestic consumption of natural rubber (mt)	^(c)	^(c)	17,000	320,900	355,000	383,300

Source: IRSG, *Rubber Statistical Bulletin*, January–February 2008.

^aLast full year for which data are available.

^bNot available.

^cNot available. Total domestic consumption by natural rubber producers in Africa other than Nigeria was estimated to be 5,000 mt in 2006. Côte d'Ivoire is known to have some domestic consumption of natural rubber to make rubber gloves. Liberia has no known domestic consumption.

Effects of Infrastructure Conditions on the Competitiveness of SSA Exports of Natural Rubber

Natural rubber producing countries in SSA are primarily hindered by a poor road network for transporting raw rubber to the processing plant and by high electricity costs. These factors raise the cost of both processing natural rubber and making consumer goods from locally produced rubber. Moreover, the unreliability of the electricity supply causes many SSA factories to use on-site electric generators, which increase factory costs compared with competitors outside the region. As a result, natural rubber producing countries in SSA cannot make goods from locally produced natural rubber that are competitive outside the domestic market.

Collection of Unprocessed Rubber

The lack of road infrastructure in SSA affects the ability of the industry to expand production. In Côte d'Ivoire, there is available, arable land considered suitable for planting more rubber trees, but the rubber industry is unable to expand because of the lack of an adequate road network connecting the rubber tappers¹²¹ to the processing facilities, and the high costs of laying paved roads in these areas.¹²² For areas harvested by small land holders, processing plants collect natural rubber from many individual farmers at distances of 50–100 km from the plant.¹²³ In the past, the plant owners covered the cost of transportation from the small farms to the plant. Many processors are now implementing a system whereby they pay the farmer a set transportation price for delivering the unprocessed rubber. Processors anticipate that this program will give small land holders an incentive to find the most efficient means of transporting their rubber.¹²⁴ The transportation price provided by the processing plant generally varies by the distance that the farmer ships the rubber. Some farmers may be able to earn an extra \$0.04 per

¹²¹ Workers that collect natural rubber from the tree.

¹²² Industry official, interview by Commission staff, Abidjan, Côte d'Ivoire, October 31, 2008.

¹²³ Industry official, interview by Commission staff, Abidjan, Côte d'Ivoire, October 31, 2008.

¹²⁴ Industry official, interview by Commission staff, Anguedou, Côte d'Ivoire, October 31, 2008.

kilogram (kg) of unprocessed rubber if they secure efficient transportation.¹²⁵ This money could be invested in expanding or improving their farms.¹²⁶

Processing Natural Rubber and Products Made of Natural Rubber

Power outages and high electricity costs are a major hindrance to competitive production of natural rubber and rubber products.¹²⁷ Electricity powers equipment that washes, masticates, and presses the water out of the collected, unprocessed rubber. Many natural rubber factories invest in their own generating facilities even if they have access to the local electricity grid, as on-site generation provides more reliable power than the grid.¹²⁸ Factories in Côte d'Ivoire that use the grid typically only use less reliable grid electricity for lighting and in offices, while production equipment runs using on-site generators.¹²⁹ Producers in Côte d'Ivoire typically use diesel generators, in part because government subsidies are highest for heavy fuels.¹³⁰ However, increases in the price of crude petroleum have prompted some producers to switch from diesel to cheaper natural gas to reduce power generation costs.¹³¹

With a few exceptions, SSA countries do not produce manufactured items from locally produced natural rubber. The ability to produce downstream products in many of the natural rubber producing countries is hampered by inadequate infrastructure and/or political instability. For example, Michelin shut down its tire plant in Nigeria in 2007 because it was no longer cost competitive.¹³² The chief executive officer of Dunlop Nigeria stated that decaying infrastructure, especially electrical power, makes production of tires in Nigeria about 40 percent more expensive than elsewhere.¹³³ A survey of manufacturers in Nigeria reported that over 90 percent of the rubber and chemical producers in the country cited electricity as the biggest infrastructure problem.¹³⁴ More than 93 percent of those surveyed experienced more than five power outages per week.¹³⁵ In 2005, the mean cost per outage to rubber and chemical producers was \$312,000.¹³⁶

Exporting Processed Natural Rubber

Most natural rubber processing plants and rubber growing areas in SSA are located along the Atlantic coast near ports. Even though the distances are relatively short, the cost of transporting containers to the ports is high.¹³⁷ Natural rubber producers in Côte d'Ivoire ship their products out of the ports of Abidjan and San Pedro; Abidjan is the larger port and handles most of the cargo. One producer in Côte d'Ivoire stated that costs of transporting containers to the port and terminal charges are high, due in part to

¹²⁵ The price that a farmer receives for raw rubber reached as high as \$0.90 per kg when petroleum prices were high, but the price in October 2008 in Côte d'Ivoire was closer to \$0.65 per kg. The price of natural rubber changes with the price of crude petroleum because a competing product, synthetic rubber, is made from petroleum. Industry official, interview by Commission staff, Abidjan, Côte d'Ivoire, October 31, 2008.

¹²⁶ Industry official, interview by Commission staff, Abidjan, Côte d'Ivoire, October 31, 2008.

¹²⁷ *Africa News*, "Nigeria: Common Tariff Will Kill Manufacturing Effort," July 29, 2007.

¹²⁸ Industry officials, interviews by Commission staff, Anguedou and Abidjan, Côte d'Ivoire, October 31, 2008.

¹²⁹ Industry official, interview by Commission staff, Abidjan, Côte d'Ivoire, October 31, 2008.

¹³⁰ Industry official, interview by Commission staff, Anguedou, Côte d'Ivoire, October 31, 2008.

¹³¹ Industry official, interview by Commission staff, Anguedou, Côte d'Ivoire, October 31, 2008.

¹³² *BBC News*, "Michelin to Close Nigerian Plant," January 18, 2007.

¹³³ *Business Times* (Singapore), "Olam, Wilmar in 50:50 African Joint Venture," November 16, 2007.

¹³⁴ Adenikinju, "Analysis of the Cost of Infrastructure Failures," table 8, February 2005, 21.

¹³⁵ *Ibid.*, table 12, 23.

¹³⁶ *Ibid.*, table 18, 26.

¹³⁷ Industry official, interview by Commission staff, Anguedou, Côte d'Ivoire, October 31, 2008.

insufficient competition among freight carriers. However, the port of Abidjan is still considered by exporters to be one of the best ports in the region in terms of infrastructure and computerization, which reduces the delay and cost of customs clearance.¹³⁸ According to the World Bank, the customs clearance and technical control portion of the export procedure take three days and cost \$81 in Côte d'Ivoire, compared to six days and \$355 in Liberia and 3 days and \$300 in Nigeria.¹³⁹ However, the high costs of port and terminal handling and inland transportation lead to a higher overall cost of export from Côte d'Ivoire than from Liberia or Nigeria (table 6.3). SSA countries rank much lower in the World Bank's Trading Across Borders ranking than their major competitors in Southeast Asia.

TABLE 6.3 Exporting costs for natural rubber-producing countries in West Africa and their major competitors

Indicator	SSA			Southeast Asia		
	Côte d'Ivoire	Liberia	Nigeria	Thailand	Indonesia	Malaysia
Documents required to export (number) ^a	10	10	9	4	5	7
Time to export (days) ^b	23	20	25	14	21	18
Cost to export (\$/container) ^c	1,904	1,232	1,179	625	704	450
SSA rank ^d	32	13	23	(^e)	(^e)	(^e)
Overall rank ^f	155	115	144	10	37	29

Source: World Bank, Doing Business Online Database (accessed January 15, 2009).

Note: Container refers to a 20-foot-long container for bulk commodities.

^aIncludes bank documents, customs clearance documents, port and terminal handling documents, and transport documents.

^bIncludes the time for obtaining all documents, inland transport, customs clearance and inspections, and port and terminal handling. Does not include ocean transport time.

^cIncludes the cost of obtaining all documents, inland transport, customs clearance and inspection, and port and terminal handling. Includes official costs only; no bribes or tariffs.

^dRankings are based on a simple average of trading across borders indicators, out of 46 SSA economies (Djibouti and Somalia are not included).

^eNot applicable.

^fRankings are based on a simple average of trading across borders indicators, out of 181 economies.

¹³⁸ U.S. Department of State, U.S. Embassy, Abidjan, "Response to Request for Information," October 2, 2008.

¹³⁹ World Bank, Doing Business Online Database (accessed February 24, 2009).

Textiles and Apparel

Summary of Findings

Infrastructure conditions are one of the many constraints affecting the competitiveness of textile and apparel exports among SSA producers, as well as between SSA producers and global competitors. Inadequate infrastructure, such as unreliable electricity, poor road quality, and limited access to international shipping, increases production costs and limits speed to market. As a result, most SSA manufacturers produce lower-value, basic apparel products. Additional constraints include, but are not limited to, geographic distances to major markets, lack of access to affordable capital, and political instability.

Introduction

Industry Overview

The textile and apparel industries¹⁴⁰ are important sources of employment and foreign exchange earnings in several SSA countries. Textile production in SSA is limited and most apparel produced for export is manufactured using fabric and trim from third-country sources such as China, Taiwan, India, and Indonesia. For example, in 2007, approximately 86 percent of U.S. apparel sourced from SSA was imported free of duty from lesser-developed AGOA beneficiary countries¹⁴¹ using fabric imported from a third country.¹⁴² SSA apparel producers generally supply foreign retailers in the United States and the EU on a contract basis with products such as basic T-shirts, jeans, and other commodity-type apparel that generally do not change in response to fashion trends.

International Trade

SSA accounted for less than 1 percent of global exports of textiles and apparel in 2007 (figure 6.9). In that year, SSA exports of textiles and apparel amounted to \$3.2 billion, the majority of which (82 percent, or \$2.6 billion) were apparel.¹⁴³ SSA exports of textiles and apparel combined are primarily destined for the U.S. and EU markets (figure 6.10). Ninety percent (\$2.35 billion) of all SSA apparel exports were shipped to these markets in 2007. In contrast, most SSA textile exports (40 percent, or \$225 million) were destined for other SSA markets.¹⁴⁴ SSA textile and apparel exports originate from a few large suppliers, namely Mauritius, Madagascar, South Africa, Lesotho, Kenya, and Swaziland. These countries accounted for 93 percent of SSA apparel exports and 77 percent of SSA textile exports in 2007.¹⁴⁵

¹⁴⁰ The textile industry covers a wide range of products, including intermediate inputs (yarns and fabrics), as well as finished products of cotton, wool, other natural fibers, and manmade fibers (i.e., made-up textile articles, including carpeting, bedding sheets, and towels). The apparel industry also covers a wide range of products, including woven, knit, or nonwoven garments such as shirts, trousers, gloves, headwear, and neckwear.

¹⁴¹ Lesser-developed AGOA beneficiary countries are those AGOA countries having a per-capita GDP of less than \$1,500 in 1998, as measured by the World Bank. In addition, AGOA also grants lesser-developed beneficiary country status to Botswana, Namibia, and most recently to Mauritius.

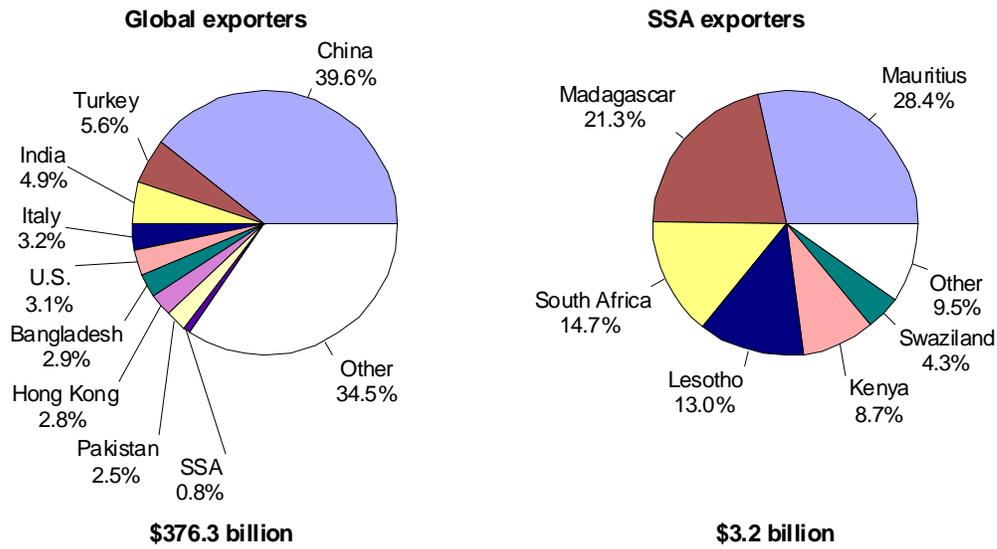
¹⁴² USDOC, OTEXA, "Trade Preference Programs," November 2008. Lesser-developed AGOA beneficiary countries eligible to export apparel to the United States are permitted to use fabric and yarn inputs sourced from third countries and maintain duty-free status. Industry sources indicate that U.S. customers often designate fabric from specific textile mills (often in Asia) for use in apparel production.

¹⁴³ GTIS, Global Trade Atlas Database (accessed October 1, 2008 and January 12, 2009).

¹⁴⁴ Ibid.

¹⁴⁵ Ibid.

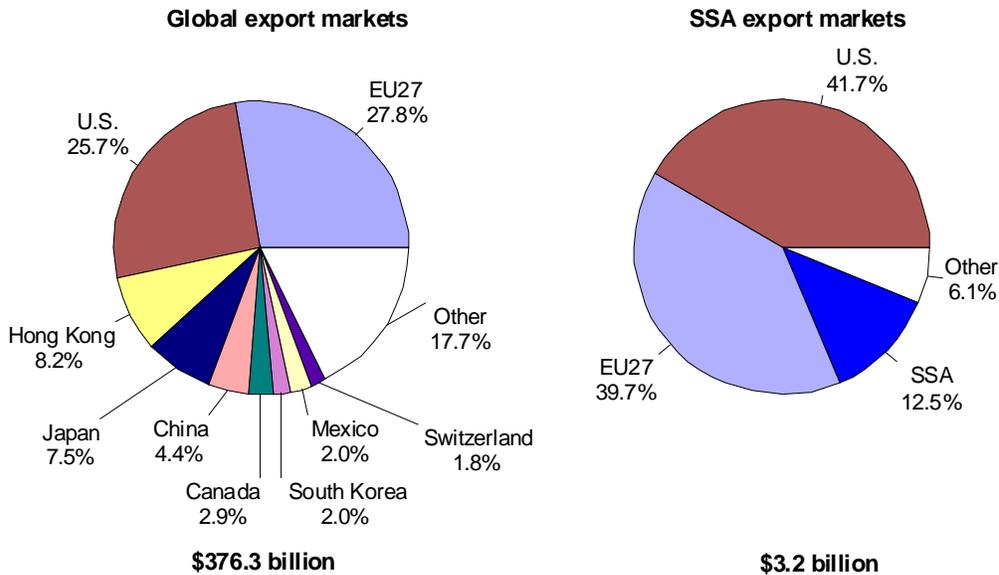
FIGURE 6.9 Leading global and SSA exporters of textiles and apparel, 2007



Source: GTIS, Global Trade Atlas Database. Annual data compiled from reporting countries' official statistics, including EU external trade.

Note: Data may not equal 100 percent due to rounding.

FIGURE 6.10 Leading markets for global and SSA exports of textiles and apparel, 2007



Source: GTIS, Global Trade Atlas Database. Annual data compiled from reporting countries' official statistics, including EU external trade.

Note: Data may not equal 100 percent due to rounding.

Effects of Infrastructure Conditions on the Competitiveness of SSA Exports of Textiles and Apparel

Poor infrastructure conditions, such as inadequate and costly electricity, poorly maintained road networks, and limited access to international shipping, undermine the competitiveness of SSA textile and apparel exports by increasing production costs and limiting speed to market. However, some SSA countries, particularly in southern Africa, do benefit from relatively better infrastructure conditions.

Electricity

Textile production requires consistent and reliable electricity for dyeing operations, spinning fibers into yarn, and knitting or weaving yarn into fabric. Apparel production requires reliable electricity for powering cutting, sewing, and finishing operations. Unexpected electricity outages often disrupt production schedules. In the case of textile production, outages can result in damaged fabric and unusable dye lots, both of which can decrease productivity and increase production costs.

Compared with other SSA markets, South African textile and apparel producers benefit from more reliable electricity, with rates of around \$0.02 per kWh,¹⁴⁶ making South Africa one of the lowest-cost electricity providers in the world.¹⁴⁷ However, in January 2008, rolling blackouts and load-shedding disrupted production schedules, resulting in decreased productivity and revenue losses for South African textile and apparel manufacturers. Industry sources indicate that firms were not provided with accurate and timely notice in anticipation of the blackouts, and thus incurred significant losses in raw materials and decreased production volumes.¹⁴⁸ One textile firm indicated that it lost 5,000 kg of dyed fabric as a result of the outages.¹⁴⁹ In November 2008, this firm subsequently announced that it would close its operations citing, among other factors, increased utility costs and the lack of a reliable electricity supply during January of that year.¹⁵⁰ In addition, South African textile manufacturers reportedly cannot rely on diesel-fueled generators to supply electricity because the cost of diesel fuel is prohibitively high.

Apparel producers in Swaziland indicate that electricity provision in the country is reliable and relatively low cost, with rates around \$0.023 per kWh—roughly 15 percent higher than in South Africa.¹⁵¹ Swaziland generates 20–25 percent of its electricity needs domestically through hydropower, and imports the remaining 75–80 percent from neighboring South Africa. The country was not subject to the load-shedding and blackouts that occurred in South Africa during early 2008 as a result of contractual electricity supply obligations.¹⁵² However, one apparel manufacturer noted that Swazi

¹⁴⁶ Eskom, *Together, Rising to the Challenge*, 2008, 4. Rate reflected is average price of electricity sold based on total sales. Original price reported as 0.1954 rand per kWh and converted to USD using the 2008 average annual exchange rate of 8.3 rand to 1 USD as reported by the IMF.

http://www.imf.org/external/np/fin/data/rms_mth.aspx?SelectDate=2008-12-31&reportType=REP.

¹⁴⁷ Industry official, interview by Commission staff, Johannesburg, South Africa, October 15, 2008.

¹⁴⁸ Industry official, interview by Commission staff, Johannesburg, South Africa, October 14, 2008.

¹⁴⁹ Industry official, interview by Commission staff, Johannesburg, South Africa, October 14, 2008.

¹⁵⁰ The firm also cited technology improvements in other markets and cost increases in raw materials in South Africa as causal factors that contributed to the plant closing. Just-style.com editorial team, “South Africa: 640 Jobs to Go,” November 6, 2008.

¹⁵¹ Swaziland Electricity Board, “Tariff Rates for 2006 and 2007,” undated (accessed November 13, 2008). Converted to USD using representative exchange rate of 10.1 rand to 1 USD as of December 9, 2008. http://www.imf.org/external/np/fin/data/rms_mth.aspx?SelectDate=2008-12-31&reportType=REP.

¹⁵² Industry official, interview by Commission staff, Mbabane, Swaziland, October 22, 2008.

producers are subjected to about 65 hours per year of blackouts on average, generally during off-peak hours.¹⁵³ This firm further noted that, although it did have a backup diesel generator, it was rarely used.

By contrast, apparel producers in Kenya indicated that electricity provision in the country is unreliable and, at \$0.22 per kWh, among the most expensive in the region—over 850 percent higher than in Swaziland.¹⁵⁴ One producer indicated that electricity rates increased by 60 percent in 2008, subjecting the firm to increased costs that it cannot pass on to its customers.¹⁵⁵ The source also noted that electricity supply is unreliable in Kenya, necessitating the use of diesel generators. On average, the firm uses a backup diesel-powered generator twice per week, which reportedly costs 20 percent more than electricity sourced from the national power grid.¹⁵⁶

Maritime Transport

Apparel firms in South Africa, Swaziland, and Lesotho should have a competitive advantage vis-à-vis other SSA producers in terms of speed to market due to their proximity to the port of Durban, which is the most advanced port in SSA and the port through which most trade in textiles and apparel flows.¹⁵⁷ Despite their relative proximity to port, industry sources in Swaziland and South Africa report that delays caused by congestion at the port of Durban hinder their ability to acquire fiber, fabric, and other critical inputs needed to maintain production schedules and ensure that shipments are delivered on time.¹⁵⁸ Sources indicate that port congestion is an obstacle to receiving shipments of inputs, while apparel exports are relatively less affected. These firms require roughly 130 days to produce and ship apparel to the United States.¹⁵⁹ In contrast, firms in India or China may require only 30–45 days to manufacture and export apparel to the United States.¹⁶⁰ Shipping times from Shanghai to the port of Los Angeles are often only 13 days,¹⁶¹ compared to as much as 45 days to ship from Durban to New York.¹⁶²

Kenyan apparel firms cite congestion at the port of Mombasa as a major constraint on their ability to receive raw materials and other inputs needed to maintain production schedules and deliver shipments on time. Because of shipment delays on the import side, production schedules are often disrupted, which costs firms money in the form of lost production. For example, one Mombasa-based apparel manufacturer stated that if clearance times for an imported container from the port to the export processing zone exceed the firm's estimates, then the factory could lose \$25,000 per day.¹⁶³ Because of the increased uncertainty of delivery, the same manufacturer noted that the firm holds higher levels of raw material inventory to hedge against delayed shipments or other unforeseen circumstances.¹⁶⁴

¹⁵³ Industry official, interview by Commission staff, Nhlanguano, Swaziland, October 22, 2008.

¹⁵⁴ Industry official, interview by Commission staff, Nairobi, Kenya, October 29, 2008.

¹⁵⁵ Industry official, interview by Commission staff, Mombasa, Kenya, October 28, 2008.

¹⁵⁶ Industry official, interview by Commission staff, Mombasa, Kenya, October 28, 2008.

¹⁵⁷ For further information on the port of Durban, see chap. 4 of this report.

¹⁵⁸ Industry official, interview by Commission staff, Durban, South Africa, October 17, 2008.

¹⁵⁹ Industry official, interview by Commission staff, Nhlanguano, Swaziland, October 22, 2008.

¹⁶⁰ Industry official, interview by Commission staff, Mombasa, Kenya, October 28, 2008.

¹⁶¹ *Searates.com*, "Statistical Data of Transit Time," undated (accessed January 14, 2008).

¹⁶² USITC, Hearing transcript, October 28, 2008, 8 (testimony of David Rantekoa, Ambassador of the Kingdom of Lesotho to the United States).

¹⁶³ Industry official, interview by Commission staff, Mombasa, Kenya, October 28, 2008.

¹⁶⁴ Industry official, interview by Commission staff, Mombasa, Kenya, October 28, 2008.

In addition to delays because of port congestion at Mombasa, Kenyan apparel producers based near Nairobi face increased transit times because of poorly maintained roads between Mombasa and Nairobi, a distance of approximately 450 km. One apparel producer based near Nairobi indicated that it can take up to one week for trucks to deliver inputs from the port of Mombasa.¹⁶⁵ Delayed shipments because of port congestion and poor road conditions can result in cancelled orders from apparel buyers, discounts to apparel buyers, or penalties incurred by the producer. One apparel producer based near Nairobi stated that if customs regulations were streamlined and port and road conditions improved, his total production costs would decrease by 10 percent, and in some cases up to 40 percent. He further noted that the cost savings would significantly enhance the firm's competitiveness.¹⁶⁶

Land Transport

Speed to market is an increasingly important factor in the global apparel industry; thus, the extent to which a firm can transport its shipments efficiently and reliably from the factory to the port is an important component of a firm's ability to compete. One way that SSA apparel firms have responded to an inefficient transportation infrastructure has been to produce low- to mid-range, commodity-type apparel products, for which speed to market is relatively less important.¹⁶⁷ SSA apparel manufacturers mainly produce basic apparel products such as T-shirts, polo shirts, and sweatshirts, which generally do not change styles in response to fashion trends.

Lesotho- and Swaziland-based textile and apparel exporters benefit from the use of neighboring South Africa's roads to transport their shipments to and from the port of Durban. The textile and apparel industries in both Swaziland and Lesotho are generally located in industrial areas near the South African border; the Swazi industries are concentrated in Matsapha (about 80 km from the South African border) and Nhlanguano (about 15 km from the South African border), and the Lesotho industries are concentrated in Maseru, along the country's western border with South Africa. These areas are roughly seven- to eight-hours'¹⁶⁸ drive (Swazi industries) and five- to six-hours'¹⁶⁹ drive (Lesotho industries) to the port of Durban. One Swaziland-based industry source indicated that the predominant constraint related to land transport is a lack of security on South African roads.¹⁷⁰ This source noted that trucks carrying the company's shipments from Nhlanguano to Durban had been hijacked on South African highways on three different occasions during the past eight years.

By contrast, the land transport system puts apparel producers in Kenya at a disadvantage relative to other key SSA textile and apparel exporting countries. According to a survey conducted by the World Economic Forum that measures the perceived quality of land transport infrastructure, Kenya was rated fourth out of the five major SSA textile and apparel producers included in the survey in terms of quality of existing roads, second in terms of quality of railroad infrastructure, and third in terms of quality of ports

¹⁶⁵ Industry official, interview by Commission staff, Nairobi, Kenya, October 29, 2008.

¹⁶⁶ Industry official, interview by Commission staff, Nairobi, Kenya, October 29, 2008.

¹⁶⁷ For further information on land transport infrastructure, see chap. 3 of this report.

¹⁶⁸ Industry official, interview by Commission staff, Nhlanguano, Swaziland, October 22, 2008.

¹⁶⁹ USITC, Hearing transcript, October 28, 2008, 10 (testimony of David Rantekoa, Ambassador of the Kingdom of Lesotho to the United States).

¹⁷⁰ Industry official, interview by Commission staff, Nhlanguano, Swaziland, October 22, 2008.

(table 6.4).¹⁷¹ Mauritius and South Africa fared better than some other global textiles and apparel producers in the survey. They were rated higher than China, Turkey, Bangladesh, and India in terms of both perceived quality of roads and port infrastructure.

¹⁷¹ While Lesotho ranked last or next to last out of the five countries surveyed, textile and apparel production in Lesotho is concentrated along the South African border and is thus relatively less affected by the adverse road conditions in the interior of the country, as compared with Kenya.

TABLE 6.4 Survey of transport quality in select textile and apparel producing countries^a

Indicator	SSA									Average of all countries surveyed
	Kenya	Lesotho	Madagascar	Mauritius	South Africa	China	Turkey	Bangladesh	India	
	<i>(1=underdeveloped, 7=extensive and efficient by international standards)</i>									
Quality of roads	2.8	2.0	2.9	4.5	4.8	4.1	3.9	2.8	2.9	3.8
Quality of railroad infrastructure	2.3	1.9	1.7	^(b)	3.5	4.1	2.2	2.3	4.4	3.0
Quality of port infrastructure	3.5	2.6 ^c	2.6	4.4	4.4	4.3	3.4	2.6	3.3	4.1
Road density ^d	11	20	9	99	30	20	55	184	114	^(b)

Source: Porter and Schwab, *The Global Competitiveness Report 2008–2009*, 2008, 385–87; Blanke and Chiesa, *The Travel & Tourism Competitiveness Report 2008*, 2008, 416–20. Survey data is based on World Economic Forum, *Executive Opinion Survey 2007*, 2008.

^aData for Swaziland are not available.

^bNot available.

^cFor landlocked countries, quality of port infrastructure measures the ease of access to port facilities and inland waterways.

^dRefers to the kilometers of road per 100 square kilometers of land, 2004.

Summary of Findings

Poor infrastructure conditions compound existing challenges faced by Ethiopian producers and exporters of leather—particularly their ability to procure quality hides and skins used as inputs to leather production. Lack of refrigeration at slaughtering facilities, long transport distances, and poor road conditions to tanneries located in the capital, Addis Ababa, where electricity is more reliable, all have a negative effect on the ability to produce and export leather competitively. Given the prevalence of livestock in rural Ethiopia, improvements in infrastructure conditions could significantly improve the export competitiveness of Ethiopia’s leather industry, generating potentially large gains to Ethiopia’s agrarian population.

Introduction

Industry Overview

The global leather industry’s production is valued at approximately \$40 billion, with over 65 percent of leather production used for footwear.¹⁷³ Hides and skins,¹⁷⁴ the primary input for leather production, are byproducts of the meat slaughter industry. According to the International Council of Tanners, hides and skins represent approximately 5–15 percent of the value of the animal.¹⁷⁵

Africa accounts for approximately 20 percent of the world’s stock of cattle, sheep, and goats but only produces about 15 percent of the world’s output of hides and skins, and less than 4 percent of global leather exports.¹⁷⁶ Ethiopia, with the 10th largest livestock herd in the world, accounts for the largest share (12 percent) of all livestock in SSA.¹⁷⁷ The livestock sector is estimated to contribute to the livelihoods of 60–70 percent of Ethiopia’s population.¹⁷⁸ The abundance of hides and skins therefore represents an economic development opportunity for a large portion of the population, and the government of Ethiopia has recognized the sector’s potential to alleviate poverty, encourage economic growth, and increase employment.¹⁷⁹

¹⁷² Leather is defined as semiprocessed and finished leather found under the HTS subheadings 4104, 4105, 4106 (semiprocessed bovine, sheep, and goat leather, respectively); 4107, 4112, 4113 (finished bovine, sheep, and goat leather, respectively); 4114 (chamois and patent leather); and 4115 (composition leather). Raw hides and skins are discussed, but only in the context of production inputs.

¹⁷³ ICT, “Perspective on Leather,” undated (accessed January 9, 2009).

¹⁷⁴ Hides denote the skin of larger animals such as cattle and buffalo, while skins denote the skin from smaller animals such as sheep and goats.

¹⁷⁵ ICT, “Introduction to Leather,” undated (accessed January 8, 2009).

¹⁷⁶ UNIDO, *A Blueprint for the African Leather Industry*, 2004, 8.

¹⁷⁷ EPA, *The Leather Industry Overview*, July 15, 2002.

¹⁷⁸ PPLPI, “The Political Economy of Pro-Poor Livestock Policy-Making in Ethiopia,” March 24, 2004, 9.

¹⁷⁹ In 2005, UNIDO, in cooperation with the government of Ethiopia, recommended policies to further develop the leather and leather goods industry and promote a domestic footwear industry. According to the plan, a thriving footwear sector would encourage tanneries to produce higher volumes of better quality leather, in turn creating demand for better quality hides and skins. UNIDO, *A Strategic Action Plan*, March 2005, 7.

The leather industry in Ethiopia is dependent upon the cattle, sheep, and goat herds from which the hides and skins are produced. Similar to other SSA countries and throughout the world, cattle, sheep, and goat herds in Ethiopia are primarily produced for subsistence dairy production and for their meat (and wool in the case of sheep), rather than for their hides and skins. Unlike livestock herds in developed countries, Ethiopia's livestock is largely raised on small family land holdings rather than on large ranches. Ninety-five percent of slaughters are performed informally on family farms or in backyards, while the remainder are performed in small, unmechanized abattoirs (slaughterhouses) located in rural areas of the country.¹⁸⁰

There are approximately 25 tanneries¹⁸¹ in Ethiopia, employing about 5,000 workers in total.¹⁸² Twenty-one of these tanneries are reportedly engaged only in the production of semiprocessed leather (i.e., pickled or wet blue) and not finished leather.¹⁸³ There are over 850 firms engaged in manufacturing finished leather products in Ethiopia.¹⁸⁴ Leather footwear accounts for the largest share of finished leather products, and there is limited production of leather garments. Finished leather products produced in Ethiopia are primarily destined for the domestic market, with only a small fraction exported.¹⁸⁵ Firms producing finished leather products are reportedly operating at 10–70 percent of capacity due to insufficient supplies of quality hides and skins, lack of trained workers, and power outages.¹⁸⁶

International Trade

In 2007, global leather exports totaled over \$17 billion, with five countries—Italy, Brazil, China, the United States, and Argentina—accounting for 50 percent of global leather exports (figure 6.11). By contrast, SSA accounted for only about 3.5 percent of total global leather exports that year. The largest SSA exporters of leather were Nigeria, South Africa, Ethiopia, and Kenya. Although Ethiopia only accounts for 10 percent of SSA exports of leather, the country's economy is much more dependent than its larger African competitors on the leather and leather goods industry for national economic development.¹⁸⁷ Ethiopian export earnings from leather accounted for about 7 percent of total export earnings in 2007, after coffee (43 percent), oil seeds (18 percent), and cut

¹⁸⁰ Industry official, interview by Commission staff, Addis Ababa, Ethiopia, November 7, 2008.

¹⁸¹ A tannery is an operation that converts raw hides and skins into either semiprocessed leather or into finished leather.

¹⁸² International Trade Centre, Leatherline Africa Platform, "Country Profile: Ethiopia," undated (accessed September 12, 2008).

¹⁸³ Industry official, interview by Commission staff, Addis Ababa, November 7, 2008. Pickling is a technique to preserve raw hides and skins for further processing. Wet blue refers to semiprocessed leather that has undergone chrome tanning. Both pickled and wet blue semiprocessed leathers are internationally traded and used as inputs to finished leather production.

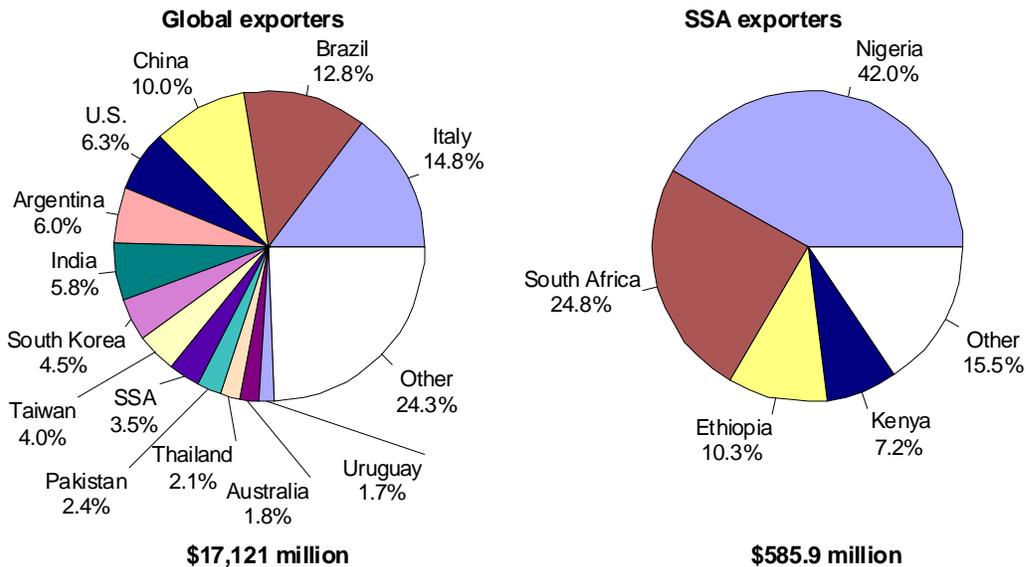
¹⁸⁴ Embassy of India in Ethiopia, "Market Note on Ethiopian Leather and Leather Products," October 1, 2008.

¹⁸⁵ For more information on the footwear industry in SSA, see USITC, *Sub-Saharan Africa*, 2008, 3-2–3-14.

¹⁸⁶ Embassy of India in Ethiopia, "Market Note on Ethiopian Leather and Leather Products," October 1, 2008.

¹⁸⁷ Nigeria's economy and exports are dominated by petroleum and petroleum products, and South Africa's agricultural production is larger and more diverse.

FIGURE 6.11 Leading global and SSA exporters of leather, 2007



Source: GTIS, Global Trade Atlas Database. Annual data compiled from reporting countries' official statistics, including EU external trade.

Note: Data may not equal 100 percent due to rounding.

flowers and plants (10 percent).¹⁸⁸ Globally, over two-thirds of leather exports are destined for China, Hong Kong, or the EU (figure 6.12). The EU is the largest market for SSA leather exports.

Effects of Infrastructure Conditions on the Competitiveness of Ethiopia's Leather Exports

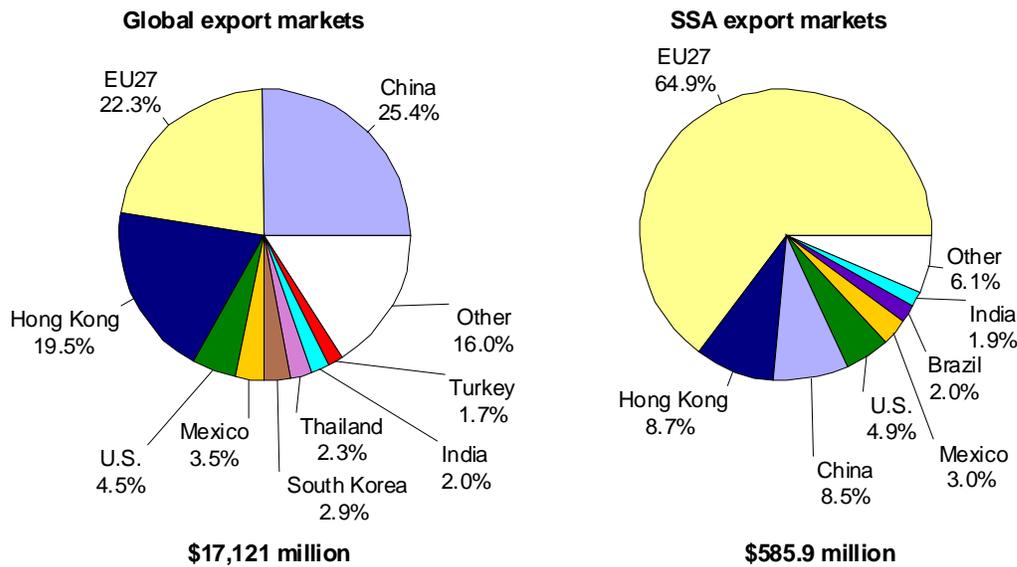
Poor infrastructure conditions compound the challenges faced by Ethiopian leather producers to acquire quality hides and skins from the hinterlands. Poor road conditions and long distances from livestock production areas in rural Ethiopia to tanneries located in Addis Ababa negatively affect the quality of hides and skins, often leading to high rejection rates and low prices paid by tanneries. High transportation costs and erratic or long delivery times for imported inputs create uncertainty of supply and can increase production costs.

Infrastructure conditions are only one of many problems facing Ethiopia's leather and leather goods industry. Other factors include poor access to capital for capacity upgrades and expansions throughout the supply chain and a shortage of highly skilled laborers to produce hides and skins and finished leather goods.¹⁸⁹ These problems and others hamper Ethiopia's leather and leather goods industry from meeting its long-term potential.

¹⁸⁸ GTIS, Global Trade Atlas Database (accessed February 3, 2009).

¹⁸⁹ Industry officials, interviews by Commission staff, Addis Ababa, Ethiopia, November 6–7, 2008.

FIGURE 6.12 Leading markets for global and SSA exports of leather, 2007



Source: GTIS, Global Trade Atlas Database. Annual data compiled from reporting countries' official statistics, including EU external trade.

Note: Data may not equal 100 percent due to rounding.

From Harvest to Tannery

The primary use of livestock is for draft animals and subsistence dairy production in rural areas of Ethiopia. Meat consumption is low, and animals are typically slaughtered in backyard operations at the end of their useful lives. Establishing slaughter and meat packing facilities near livestock production is problematic, because the lack of an adequate and reliable electricity supply will not allow refrigeration. In addition, high transportation costs render selling to markets where meat is consumed uneconomical. As a result, livestock are often trekked on foot over long distances to slaughter facilities located closer to markets where meat, hides, and skins are traded. These journeys often damage the quality of meat, hides, and skins because of weight loss, disease, and injury to the animals.¹⁹⁰

Because hides and skins are byproducts of the slaughter process, they must be shipped to tanneries for further processing into leather. The quality of the hides and skins and the prices tanneries pay depend on the quality of the grain (or outside) surface. Damage to the grain surface may be due in part to animal husbandry practices on the farm or in transport of the live animal (scratches, bruising, or dirt contamination); damage during slaughter or removal of the hide; or inadequate preservation techniques.¹⁹¹ Within five hours of slaughter, hides and skins must begin the tanning process or be preserved in some other fashion. Salt is often used to preserve hides and skins; however, it is not always available in rural areas. In addition, transporting salt to these areas is expensive because of long distances and poor road conditions.¹⁹² Other factors, such as government

¹⁹⁰ Industry official, interview by Commission staff, Addis Ababa, Ethiopia, November 7, 2008.

¹⁹¹ ICT, "Hide and Skin Quality," undated (accessed January 9, 2009).

¹⁹² Industry official, interview by Commission staff, Addis Ababa, Ethiopia, November 7, 2008.

trade and industrial policies to encourage leather production, have also affected the supply of hides and skins to tanneries (box 6.3).

BOX 6.3 Government Trade Policies Affecting the Leather Industry

The government of Ethiopia has long used trade policy to encourage further downstream processing in the leather industry. In 1986, Ethiopia instituted a ban on the exportation of raw hides and skins in order to encourage the domestic production of leather and leather goods with inexpensive and plentiful inputs. The Ethiopian government sought to develop and strengthen the leather and leather goods industry, as well as boost downstream footwear production. Potential overseas markets for hides and skins were closed, and the only purchasers for hides and skins were merchants supplying domestic tanneries. The result of this policy was that the merchants had a captive supply of hides and skins and offered producers low prices. Low prices, coupled with long transit times from slaughter facilities to tanneries, had a dampening effect on the supply of hides and skins, and many hides and skins from the rural countryside never entered the distribution chain. As a result, tanneries continued to suffer from relatively low capacity utilization rates.^a

In February 2008, the government of Ethiopia replaced the ban with export taxes of 150 percent on raw hides and skins and 5–20 percent on certain semiprocessed leathers.^b This policy change was instituted primarily to meet membership requirements for joining the WTO,^c and its long-term effect on prices for high-quality hides and skins is not yet known. However, some tanneries have experienced difficulties moving into finished leather processing. For example, one semiprocessed leather producer stated that, to avoid the export tax on semiprocessed leather, his company would need to invest \$5–6 million in equipment; however, credit, technological skills, and skilled labor are difficult to obtain.^d In January 2009, the government further increased the export taxes on certain semiprocessed leather from 5–20 percent to 150 percent in an effort to increase downstream processing.^e

^a Van der Loop, "The Importance of the Leather Footwear Sector," June 2003, 6.

^b Embassy of India in Ethiopia, "Market Note on Ethiopian Leather and Leather Products," October 1, 2008.

^c Tadessem, "Ethiopia: House Imposes 150% Tax," December 2, 2008.

^d Industry official, interview by Commission staff, Addis Ababa, Ethiopia, November 7, 2008.

^e Industry official, e-mail message to Commission staff, March 23, 2009.

Only 60 percent of the hides and skins of slaughtered animals are sent to tanneries, with the remainder either discarded after slaughter or lost in transit to tanneries. Of those that reach their final destination, 20 percent of them, on average, are rejected because of poor quality, although rejection rates can reach 80 percent. Because quality is often not discernable in untanned hides, prices paid by tanneries are low to help offset the costs incurred from rejected hides and skins. Nevertheless, damage to hides and skins increases production costs to tanneries.¹⁹³

Processing at Tanneries

Adequate and reliable electricity supply is a critical input to the tanning process. Tanneries are located near Addis Ababa because of the availability of relatively more reliable electricity. However, tanneries are often faced with frequent electricity outages, which disrupt the chemical processes to tan hides and skins into semiprocessed and finished leather. On-site power generators are used as backup power supply, but are costly to operate.¹⁹⁴

¹⁹³ Industry official, interview by Commission staff, Addis Ababa, Ethiopia, November 7, 2008.

¹⁹⁴ Industry official, e-mail message to Commission staff, August 12, 2008.

Unreliable shipment schedules and high transportation costs adversely affect the ability of tanneries to source needed production inputs. For example, tannery chemicals are not produced domestically and are thus imported.¹⁹⁵ One tannery noted that it requires 60–80 imported chemicals, as well as machinery, to produce finished leather. Because of the high cost of imported inputs, most of this tannery’s working capital is allocated to imported raw materials. In addition, because transit times for needed inputs can be three or four months, the tannery maintains a six- to seven-month supply of chemicals to hedge against the uncertainty of future delivery schedules.¹⁹⁶

From Tanneries to Export Markets

Ethiopia is landlocked, and Djibouti is the primary port for exports, accounting for 98 percent of Ethiopia’s international trade access.¹⁹⁷ Containers must first clear the border between Ethiopia and Djibouti, and then be transported to the port. In 2007, the average time required to export containers from Ethiopia was 46 days,¹⁹⁸ greater than the 25 days to export from Nigeria and 30 days from South Africa, and more than double the time to export from Italy or Brazil, the world’s largest leather exporters (figure 6.11).¹⁹⁹ The cost to export a container from Ethiopia is four times the cost from China,²⁰⁰ and comprises both the cost of administrative delays and long transit times from the factory or tannery to the port. Recognizing these delays and congestion, Ethiopia’s Ministry of Transport and Communications is developing two domestic dry ports²⁰¹ near the border with Djibouti—one in Modjo and the other in Semera—to alleviate congestion at the port of Djibouti. The Modjo port was open for operation in December 2008, and the Semera port is scheduled for completion in early 2009.²⁰² The dry ports will include warehouses, inland roads, container depots, customs offices, and insurance companies.²⁰³

¹⁹⁵ Only salt, sulfuric acid, and lime are reportedly available domestically. Industry official, interview by Commission staff, Addis Ababa, Ethiopia, November 6, 2008.

¹⁹⁶ Industry official, interview by Commission staff, Addis Ababa, Ethiopia, November 6, 2008.

¹⁹⁷ EIU, *Country Profile 2008: Ethiopia*, 2008, 17.

¹⁹⁸ World Bank, *Doing Business 2009 Database* (accessed January 14, 2009).

¹⁹⁹ *Ibid.*

²⁰⁰ *Ibid.*

²⁰¹ A dry port is an inland intermodal terminal directly connected by road or rail to a seaport. Dry ports include facilities for storage and consolidation of goods in transit and customs clearance services.

²⁰² Abebe, “Time for Dry Port Service,” November 1, 2008.

²⁰³ Zenebe, “Ethiopia: Spicing Up of Dry Ports’ Board,” September 9, 2008.

Tourism

Summary of Findings

Tourism represents an important export opportunity for SSA countries that can lead to significant foreign exchange revenues by promoting popular tourism attractions, particularly safari lands and beach areas.²⁰⁴ Tourism exports in SSA, however, have not reached their full potential, due in part to the lack of infrastructure services in many countries, including reliable electric power and transportation to tourist attractions.²⁰⁵ South Africa and Kenya are the two largest tourist destinations in SSA. South Africa's superior infrastructure helps to attract tourists, as well as large numbers of business travelers from other SSA countries. However, tourists visit Kenya's well-known safari lands and beaches despite the country's poor infrastructure, particularly its road network. Therefore, while infrastructure conditions are not necessarily a primary driver of demand for SSA tourism exports as a whole, differing infrastructure conditions among SSA countries may be a crucial factor in tourists' decisions to choose one SSA country over another as a vacation destination. Political factors, including civil unrest, economic conditions in tourists' home countries, and the high cost of travel from many developed countries, are all likely to have a stronger impact on overall SSA exports of tourism services.

While existing infrastructure conditions affect SSA exports of tourism services, the cause and effect relationship between tourism and infrastructure may work both ways—increasing tourism in a particular area may also lead to improvements in infrastructure conditions that benefit local residents. In Swaziland, for instance, development of tourist resorts has brought infrastructure improvement to some local areas in the form of new roads, increased electric power access/supply, improved telephone access, and running water.²⁰⁶

Tourism in the Global Economy

According to the World Travel and Tourism Council, annual growth of the global tourism industry is anticipated to average 4.4 percent in the coming decade, with SSA tourism projected to grow at a faster annual rate of 5.8 percent.²⁰⁷ SSA tourism exports totaled \$16 billion in 2006, yet SSA was a relatively small tourist destination in terms of global tourism expenditures compared with larger destinations such as Europe and the United States (figure 6.13). South Africa is by far the predominant tourist destination in SSA, accounting for nearly one-half of the region's tourism revenues, followed by Mauritius, Tanzania, and Kenya.²⁰⁸ Top global importers of tourism services (i.e., the largest expenditures by outbound tourists) in 2006 included Germany, the United States, and the

²⁰⁴ Tourist expenditures on services such as hotels and restaurants by foreign visitors in SSA countries are considered to be exports of tourism services by SSA countries. Such exports include expenditures for both business and leisure travel. Conversely, tourist expenditures by SSA residents outside of their home countries are considered to be imports of tourism services.

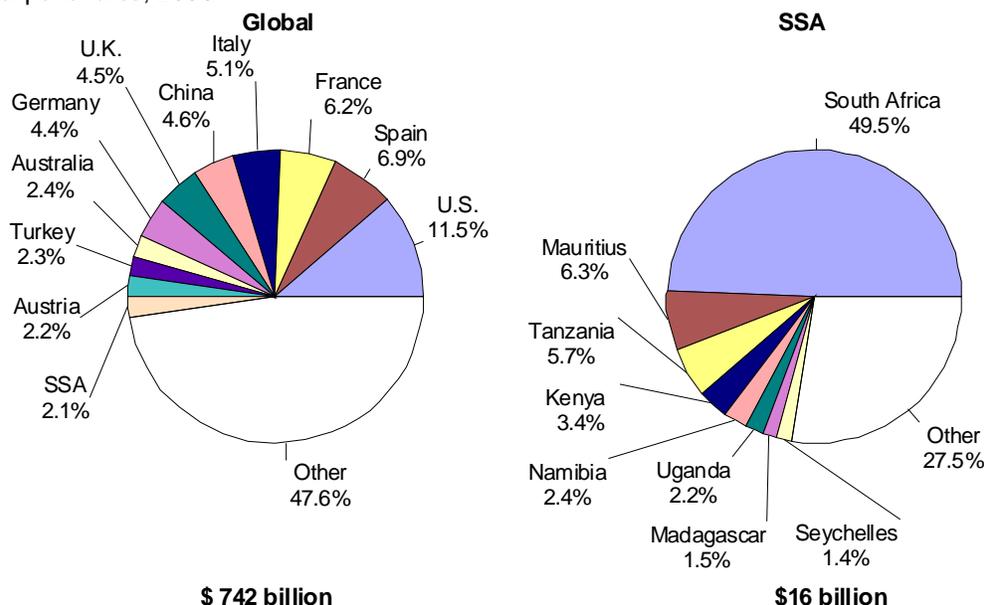
²⁰⁵ Maritime infrastructure conditions have likely had a negligible effect on export competitiveness because the cruise industry in SSA is relatively small and accounts for a small proportion of total tourism revenues.

²⁰⁶ Naudé and Saayman, "The Determinants of Tourist Arrivals," March 21–22, 2004; USAID and TechnoServe, "Tourism Industry Strategic Plan," December 2006.

²⁰⁷ World Travel and Tourism Council, "Progress and Priorities, 2008/09," March 1, 2008.

²⁰⁸ Countries are ranked in terms of total tourism expenditures.

FIGURE 6.13 Leading global and SSA exporters of tourism services, by total tourism expenditures, 2006



Sources: UNWTO, *Tourism Highlights 2008* edition; UNWTO, *Yearbook of Tourism Statistics 2006, 2007, and 2008*. Kenya data are from the EIU, *Country Profile: Kenya, 2007*.

Notes: A country's exports of tourism services reflect expenditures by foreign residents on personal or business travel in that country. Data may not equal 100 percent due to rounding.

United Kingdom (figure 6.14). South Africa was the largest SSA importer of tourism services in 2006 by the same measure.

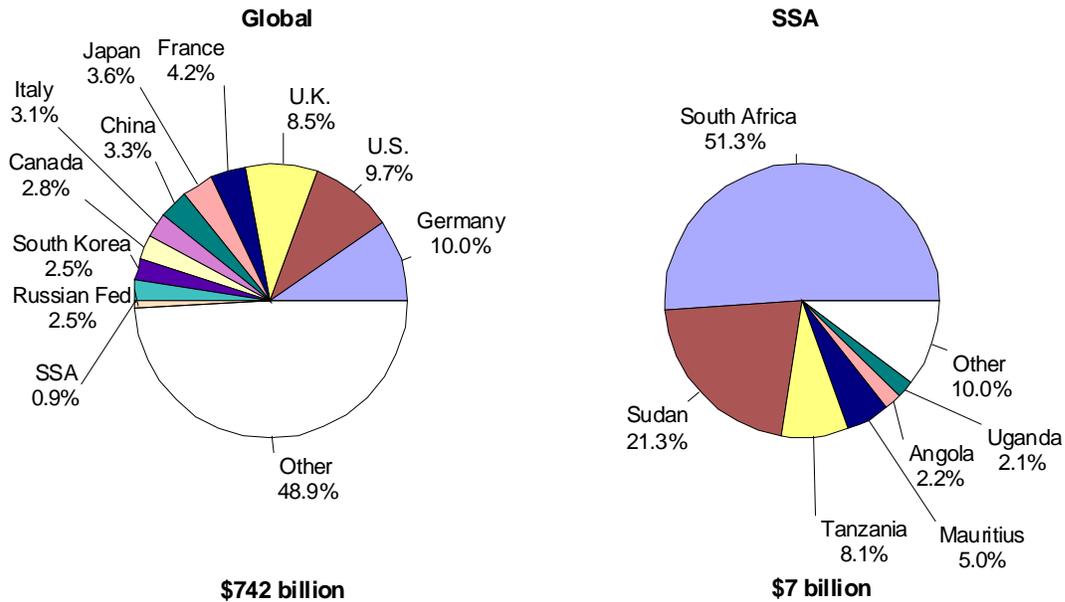
In 2006, tourism exports accounted for 8 percent of total SSA exports of goods and services.²⁰⁹ During the 2000–06 period, tourist arrivals in several SSA countries increased rapidly, although there are not enough data to provide a reliable estimate of the rate of increase in tourist arrivals for the entire region (table 6.5). South Africa registered the largest absolute growth in the number of arrivals during the period, followed by Kenya, Swaziland, and Uganda. Sudan recorded a sharp increase in arrivals beginning in 2005, which may reflect business travelers connected to the oil industry.

Several factors contribute to SSA's above average growth in tourism exports. Despite the region's relatively small size as a global tourist destination, new airline routes from Europe, Asia, and the Middle East have generated more traffic, and several SSA countries have greatly increased their marketing budgets around the world, helping to draw attention to tourist attractions throughout the region.²¹⁰ However, the global financial crisis that began in the fall of 2008 may reduce these growth projections.

²⁰⁹ IMF, International Financial Statistics Online Database. Percentage is calculated for the 29 SSA economies for which 2006 data on both exports of total goods and services and of travel services were available.

²¹⁰ Michaels, "Travel Journal," March 12, 2008; Ba and Mann, "Tourism: An Opportunity to Unleash Shared Growth in Africa," July 2006.

FIGURE 6.14 Leading global and SSA importers of tourism services, by total tourism expenditures, 2006



Sources: United Nations, World Tourism Organization (UNWTO), *Tourism Highlights 2008* edition and the *Yearbook of Tourism Statistics 2006-08*.

Note: A country's imports of tourism services reflect expenditures by the residents of that country on personal or business travel in other countries.

European and North American consumers are likely to reduce their tourism expenditures in response to the economic downturn, with particular pressure on locations in Africa that are often perceived as exotic destinations.²¹¹

Data are not available for the leading importers of tourism services from the SSA region as a whole, but there are data available for the two largest SSA destinations in terms of visitor arrivals, South Africa and Kenya. For South Africa, 74 percent of tourists arrived from within Africa in 2006, the majority from neighboring southern African countries. Europe accounted for 17 percent of tourist arrivals in South Africa, and the United States, 3 percent.²¹² For Kenya, European travelers accounted for 73 percent of tourist arrivals in 2004 (latest available), most prominently from Germany (22 percent of total arrivals) and the United Kingdom (17 percent). Travelers from other African countries accounted for 9 percent of tourist arrivals in Kenya, and travelers from the United States accounted for 6 percent.²¹³ The greater share of African travelers to South Africa likely reflects that country's status as a regional shopping and tourism destination.

²¹¹ For example, see World Bank, "The Impact of the Financial Crisis on the Developing World," winter 2009; and Business Monitor International, "Tourism Industry to Feel the Pinch," November 13, 2008.

²¹² UNWTO, *Yearbook of Tourism Statistics 2008*, 2006.

²¹³ UNWTO, *Yearbook of Tourism Statistics 2006*, 2004.

Tourism and Infrastructure in South Africa

South Africa is by far the leading tourist destination in the region, receiving 8.4 million overnight tourist arrivals in 2006, up from 5.9 million arrivals in 2000 (table 6.5). The vast majority (94 percent) were classified as leisure, rather than business, travelers. Export revenues from tourist expenditures in South Africa were \$7.9 billion in 2006, up from \$2.7 billion in 2000, equal to 10.4 percent of all South African exports of goods and services.²¹⁴

According to one local industry representative, good quality infrastructure is “the backbone of the tourism industry in South Africa,” making the industry exceptionally competitive compared with those in other SSA countries.²¹⁵ There are adequate roads to the country’s major tourist sites, such as game lodges, national parks, and the Western Cape area. By comparison, some popular sites in Botswana are only accessible to tourists by airplane. South Africa is continuing efforts to upgrade its infrastructure to the benefit of the tourism sector. For example, the respective governments are collaborating to fund an extensive project to upgrade and expand the principal road between Witbank, South Africa, and Maputo, Mozambique, in part to increase access for international tourists.²¹⁶

One significant drawback to South Africa’s efforts to attract tourists, however, is the lack of an adequate public transportation system, which forces tourists to hire private drivers or use a tour company to travel around the country. This increases costs for independent travelers that prefer not to join a tour group, and thus likely reduces the overall number of independent travelers visiting the country. In addition, South Africa receives a significant number of tourists from elsewhere in SSA that come to South Africa as a shopping destination; this type of tourism would particularly benefit from improved public transit.²¹⁷

Electric power availability and reliability is an important issue nationally, but does not appear to be as significant of a problem for the tourism industry as it is for other industries, including manufacturing. The principal tourist venues, which are generally located in rural areas, tend to be fully self-reliant, with their own generators and in some cases solar or gas-fired power supplies.²¹⁸ Occasional problems do occur, however. In addition to the higher costs and noise pollution associated with relying on generators, unreliable electricity supply can lead to other problems. In one recent instance, approximately 500 tourists were trapped on top of Table Mountain, a popular tourist attraction in Cape Town, when load-shedding rendered a cable car inoperable. Thirty-seven passengers were stuck in the cable car for three hours, and those atop the mountain were not rescued until after 1:00 am.²¹⁹

²¹⁴ UNWTO, *Yearbook of Tourism Statistics 2008*, 2006; IMF, International Financial Statistics Online Database (accessed October 29, 2008).

²¹⁵ Industry official, interview by Commission staff, Johannesburg, South Africa, October 24, 2008.

²¹⁶ Industry official, interview by Commission staff, Johannesburg, South Africa, October 24, 2008; TRAC, “Objectives and Benefits,” undated (accessed December 12, 2008).

²¹⁷ Industry official, interview by Commission staff, Durban, South Africa, October 15, 2008.

²¹⁸ Industry official, interview by Commission staff, Durban, South Africa, October 15, 2008.

²¹⁹ Macdonald, “Don’t Turn Out the Lights,” February 5, 2008; De Waal, “Power Cut,” January 22, 2008.

TABLE 6.5 Tourist arrivals in SSA countries, available data, 2000–2006

Country	2000	2001	2002	2003	2004	2005	2006	CAGR %	Absolute growth, 2000–2006
	1,000 visitors								1,000 visitors
Angola	51	67	91	107	194	210	121	15.5	70
Benin	96	88	72	175	174	176	180	11.0	84
Botswana	1,104	1,049	1,037	975	(^a)				
Burkina Faso	126	128	150	163	222	245	264	13.1	138
Burundi	29	36	74	74	133	148	201	38.1	172
Cameroon	277	221	226	(^a)	190	(^a)	(^a)	(^a)	(^a)
Cape Verde	115	134	126	150	157	198	242	13.2	127
Central African Republic	11.2	9.9	2.9	5.7	8.2	(^a)	(^a)	(^a)	(^a)
Chad	43	57	32	21	(^a)				
Comoros	24	19	19	14	18	(^a)	(^a)	(^a)	(^a)
Congo, Rep. of	19	27	22	(^a)					
DRC	103	55	28	35	36	61	(^a)	(^a)	(^a)
Djibouti	20.1	21.6	22.5	23.2	26.3	(^a)	(^a)	(^a)	(^a)
Eritrea ^b	70	113	101	80	87	83	78	1.8	8
Ethiopia	136	148	156	180	184	227	290	13.5	154
Gabon	155	169	208	222	(^a)				
The Gambia	79	57	81	73	90	108	125	7.9	46
Ghana	399	439	483	531	584	(^a)	(^a)	(^a)	(^a)
Guinea	33	38	43	44	45	45	46.1	5.7	13
Guinea-Bissau	(^a)	7.8	(^a)	(^a)	(^a)	5.4	11.6	(^a)	(^a)
Kenya ^b	899	841	838	927	1,199	1,479	1,601	10.1	702
Lesotho ^c	302	295	287	329	304	304	347	2.3	45
Madagascar	160	170	62	139	229	277	312	11.8	152
Malawi	228	266	383	424	471	(^a)	(^a)	(^a)	(^a)
Mali	86	89	96	110	113	143	153	10.1	67
Mauritania	30	(^a)							
Mauritius	656	660	682	702	719	761	788	3.1	132
Mozambique	(^a)	323	541	441	470	(^a)	(^a)	(^a)	(^a)
Namibia	(^a)	670	757	695	(^a)	778	833	(^a)	(^a)
Niger	50	53	39	55	57	60	60	3.1	10
Nigeria	813	850	887	924	962	(^a)	(^a)	(^a)	(^a)
Rwanda	104	113	(^a)						
São Tomé & Príncipe	7.1	7.6	9.2	10.0	10.6	15.8	12.3	9.6	5
Senegal	389	396	427	354	363	(^a)	(^a)	(^a)	(^a)
Seychelles	130	130	132	122	121	129	141	1.4	11
Sierra Leone	16	24	28	38	44	40	34	13.4	18
South Africa	5,872	5,787	6,430	6,505	6,678	7,369	8,396	6.1	2,524
Sudan	38	50	52	52	61	246	328	43.2	290
Swaziland	281	283	256	461	459	839	873	20.8	592

TABLE 6.5 Tourist arrivals in SSA countries, available data, 2000–2006—*Continued*

Country	2000	2001	2002	2003	2004	2005	2006	CAGR %	Absolute growth 2000–2006
	1,000 visitors								1,000 visitors
Tanzania	459	501	550	552	566	590	622	5.2	163
Togo	60	57	58	61	83	81	(^a)	(^a)	(^a)
Uganda	193	205	254	305	512	468	539	18.7	346
Zambia ^d	457	492	565	413	515	(^a)	670	6.6	213

Sources: UNWTO, *Yearbook of Tourism Statistics 2008*, 2006; EIU, *Country Profile: Kenya*, 2007.

Note: CAGR is the compound annual growth rate.

^aNot available.

^bData for 2005 and 2006 from Kenyan Tourism Ministry for departures (WTO data not available).

^cData for total visitors, includes same-day and cruise ship arrivals.

^dData for 2006 from EIU (WTO data not available).

The South African government created an incentive program for foreign investment in the tourism industry, specifically for projects located outside the metropolitan areas of Johannesburg, Cape Town, and Durban, the three most developed areas of the country. Investments in rail, road, and maritime transport infrastructure projects related to tourism are specifically included in the incentive program.²²⁰

Tourism and Infrastructure in Kenya

Tourism is one of Kenya's largest export sectors, by far its largest service export industry, and the largest foreign exchange earner after foreign remittances.²²¹ Exports of tourism services were valued at \$687.5 million in 2006, equal to 11.5 percent of all Kenyan exports of goods and services.²²² Tourist arrivals in Kenya reached 1.6 million in 2006, up steadily from 899,000 in 2000, with a compound average growth rate of 10.1 percent (table 6.5).²²³ Of this total, 65 percent were classified as leisure, rather than business, travelers.²²⁴

Although not yet reflected in the national statistics, Kenya's tourism industry suffered a serious blow in 2008 from ethnic unrest following the presidential election of December 2007. Early forecasts predicted total tourism revenues of \$1 billion in 2008, but government estimates in spring 2008 were forecasting revenues of one-half that amount for the year. Occupancy rates in many Kenyan hotels dropped to 20 percent in early 2008, from a standard occupancy rate of approximately 80 percent, prompting layoffs of

²²⁰ Grant amounts vary based on the size of the project, with a smaller share of costs covered by the grant as total project costs rise. Government of the Republic of South Africa, DTI, *Programme Guidelines*, July 4, 2008.

²²¹ Other important export sectors are tea, coffee, horticulture, sugar, and apparel. World Bank, *Kenya: Unleashing the Potential*, February 2007, xv–xvi, 73–74; EIU, *Country Profile: Kenya*, 2007. For more information on Kenya's apparel exports, see the case study presented in chap. 6 of this report.

²²² IMF, International Financial Statistics Online Database (accessed October 29, 2008); EIU, *Country Profile: Kenya*, 2007.

²²³ Tourist arrivals data in Kenya are likely to be underestimated, as government data do not include arrivals by railways, road, and water passenger transport. See Lumiti, "Country Moves to Create a Tourism Data Base," February 2, 2009.

²²⁴ UNWTO, *Yearbook of Tourism Statistics 2006*, 2004.

staff, reduced revenue from souvenir sales, and sharply decreased national park revenues from entrance fees.²²⁵ Tourism earnings for third quarter 2008 were down 30 percent compared with the same period in 2007, and tourist arrivals were down 22 percent compared with 2007; the Kenya Tourist Board anticipates recovery efforts to continue throughout 2009. Moreover, Kenya's tourist arrivals also suffered from the high fuel prices that affected the rest of the global tourism industry.²²⁶

On a more positive note for Kenyan tourism, several observers foresee an increase in tourist arrivals from the United States and elsewhere following President Barack Obama's election. Tour operators have organized itineraries covering Nyang'oma Kogelo (the home village of President Obama's father), the surrounding Luo ethnic areas, and other local tourist sites; these operators anticipate strong interest.²²⁷ Within two weeks of the U.S. election, the Ministry of Tourism had announced that plans were underway to brand the village as a tourist destination along "the Obama route," and had begun work to upgrade the local roads and to supply electricity to the village.²²⁸

Kenya's tourism industry focuses on the three pillars of safari, beach, and business conference tourism, but infrastructure problems, particularly poor roads, are seen as significant factors restraining the industry's growth potential.²²⁹ Kenya has not built any significant new roads since the 1960s, even though tourist arrivals have tripled, the number of hotels has quadrupled, and nontourist automotive traffic in Kenya has grown exponentially. The result is extremely crowded roads that make it very difficult for tourists or other travelers to move around the country. Mombasa, one of Kenya's primary tourist destinations, does not have a bypass road around the city, so all traffic must move through the city center, leading to extreme traffic congestion. Traffic congestion deters tourists from leaving their resorts to explore the city, thus greatly reducing tourism receipts beyond the resort areas.²³⁰ Outside of the resort areas, tourists have also cited poor road quality as the worst part of their experience in Kenya. On a typical seven-day safari, a tourist will drive 2,500 km on bitumen roads with extensive potholes, an experience about which tourists have complained in exit surveys.²³¹

The Kenya Tourist Board's corporate strategic plan for 2005–08 recognized that poor road quality is a major problem for the nation's tourist infrastructure. The plan particularly cited the need to repair vital roads leading to the national parks, such as the Narok Road which leads to the Maasai Mara game reserve. The plan proposed increasing private-sector involvement in developing new roads and rehabilitating existing roads, as well as increasing government funding for road maintenance and new toll roads.²³²

Kenya's tourism sector suffers from two main problems associated with electricity. First, electric power is very expensive, and prices increased sharply in July 2008. According to one industry representative, the total energy cost for an average hotel is higher than total

²²⁵ Gettleman, "Kenyan Tourism Suffering Badly," February 29, 2008; Crilly, "After Violence, Kenya Tourism Struggles," March 4, 2008.

²²⁶ Lumiti, "Kenya Tourism Yet to Recover," November 2, 2008.

²²⁷ *Tourism Review.com*, "Obama Effect," November 25, 2008.

²²⁸ Mayoyo, "Obama Father's Birth Place 'Kogelo Village' Declared Touristic Destination," November 18, 2008.

²²⁹ Other constraints cited by the World Bank were, most importantly, the regional and domestic security situation, the deterioration of the country's tourism facilities (such as hotels) and tourism-related services, and weak government marketing and promotion activities. World Bank, *Kenya: Unleashing the Potential*, February 2007, 75.

²³⁰ Industry official, interview by Commission staff, Mombasa, Kenya, October 28, 2008.

²³¹ Industry official, interview by Commission staff, Mombasa, Kenya, October 28, 2008.

²³² Kenya Tourist Board, "Corporate Strategic Plan 2005–2008," undated.

employee wages. Second, supply is inadequate. Hotels are forced to compensate for supply shortages by maintaining expensive on-site generators, which also leads to higher costs that are passed on to tourists.²³³ However, given other factors that influence tourism exports, such as political unrest and economic conditions in importing countries, it is not clear to what extent such increased costs for electric power dampened exports of Kenyan tourism services.

²³³ Industry official, interview by Commission staff, Mombasa, Kenya, October 28, 2008.

Bibliography

Coffee

- ACDI/VOCA. "Rwandan Coffee Gets High Marks," December 2007.
<http://www.acdivoca.org/acdivoca/PortalHub.nsf/ID/FeatureRwandaCoffee>.
- . "Specialty Coffee: Increased Quality & Profits for Smallholders," undated.
[http://www.acdivoca.org/852571DC00681414/Lookup/coffeebroweblyout/\\$file/coffeebroweblyout.pdf](http://www.acdivoca.org/852571DC00681414/Lookup/coffeebroweblyout/$file/coffeebroweblyout.pdf) (accessed September 9, 2008).
- Baffes, John. "Restructuring Uganda's Coffee Industry: Why Going Back to the Basics Matters." World Bank Policy Research Working Paper no. 4020, October 2006.
- Boudreaux, Karol C., and Puja Ahluwalia. "Cautiously Optimistic: Economic Liberalization and Reconciliation in Rwanda's Coffee Sector." Unpublished paper, 2008
http://works.bepress.com/cgi/viewcontent.cgi?article=1019&context=karol_boudreaux (accessed September 30, 2008).
- Dougherty, Carter. "Rwanda Savors the Rewards of Coffee Production." *New York Times*, July 27, 2004.
<http://query.nytimes.com/gst/fullpage.html?res=9502E6DC153DF934A15754C0A9629C8B63&fta=y>.
- Dow Jones Newswires*. "Uganda Coffee Exports Still Halted by Kenya Violence," January 9, 2008.
<http://www.flex-news-food.com/pages/13428/Coffee/Uganda/uganda-coffee-exports-halted-kenya-violence-dj.html>.
- Economist Intelligence Unit (EIU). *Country Profile 2008: Rwanda*. London: Economist Intelligence Unit, 2008.
- Fraser, Laura. "Coffee, and Hope, Grow in Rwanda." *New York Times*, August 6, 2006.
http://ocir.vrsrv.com/archive/ocir_nyt_0806.htm.
- Global Trade Information Service, Inc. (GTIS). Global Trade Atlas Database (accessed October 1, 2008).
- Gottlieb, Benjamin. "Rwanda Project Members Discuss Coffee-Bike." *Daily Nexus*, February 22, 2008.
<http://www.dailynexus.com/article.php?a=15950>.
- International Coffee Organization. "Field Processing," undated. http://www.ico.org/field_processing.asp (accessed January 9, 2009).
- Lewin, Bryan, Daniele Giovannucci, and Panos Varangis. *Coffee Markets: New Paradigms in Global Supply and Demand*. Washington, DC: The World Bank, 2004.
- Loveridge, Scott, Edson Mpyisi, and Michael T. Weber. "Farm Level Perspectives In Rwanda's Coffee Supply Chain Coordination Challenge." Department of Agricultural Economics. Michigan State University. International Development Collaborative Policy Briefs no. RW-FSRP-PB-2E, March 2002.

Project Rwanda. "The Coffee Bike," undated. <http://projectrwanda.org/cargo-bike> (accessed September 9, 2008).

Schilling, Michele, and Tom McConnell. "Model for Siting Coffee Washing Stations in Rwanda." Paper presented at Environmental Systems Research Institute, Inc., International Users Conference, San Diego, CA, July 2004. <http://gis.esri.com/library/userconf/proc04/docs/pap1697.pdf>.

Sweet Maria's Coffee Cupping Reviews. "Africa: Rwanda," undated. <http://www.sweetmarias.com/coffee.africa.rwanda.html> (accessed September 30, 2008).

United Nations Industrial Development Organization (UNIDO). Regional Office for Ethiopia, Uganda, and Rwanda. "Agro-Industries Development in Ethiopia." Addis Ababa, Ethiopia, 2007.

U.S. Agency for International Development (USAID). "Producers Wake Up and Smell the Coffee," July–August 2005. http://www.usaid.gov/press/frontlines/fl_julaug05/infocus.htm.

U.S. Department of Agriculture (USDA). Foreign Agricultural Service (FAS). Production, Supply, and Distribution Online Database. <http://www.fas.usda.gov/psdonline/psdHome.aspx> (accessed February 3, 2009).

U.S. Department of State. U.S. Embassy, Addis Ababa. "USITC Report: Ethiopia's Infrastructure Effects on Export Competitiveness (ADDIS ABABA 002868)," October 8, 2008.

U.S. International Trade Commission (USITC). Hearing transcript in connection with inv. no. 332-477, *Sub-Saharan African: Effects of Infrastructure Conditions on Export Competitiveness, Third Annual Report*, October 28, 2008.

———. *Sub-Saharan Africa: Factors Affecting Trade Patterns of Selected Industries, Second Annual Report*, USITC Publication 3989. Washington, DC: USITC, 2008.

World Bank. Doing Business Online Database. <http://www.doingbusiness.org> (accessed various dates).

Shea Butter

Chalfin, Brenda. *Shea Butter Republic: State Power, Global Markets, and the Making of an Indigenous Commodity*. New York: Routledge, 2004.

Elias, Marlene, and Judith Carney. "African Shea Butter: A Feminized Subsidy from Nature." *Africa* 77, no. 1 (January 1, 2007): 37–63.

Fintrac, Inc. "Buying and Selling Shea Butter: A Marketing Manual for West Africa," October 2002. <http://www.gasselconsult.com/shea/sheadocs/Buying%20and%20Selling%20Shea%20Butter%20Fintrac.pdf>.

LMC International, Ltd. "The Impact of Directive 2000/26/EC on the Economies of those Countries Producing Cocoa and Vegetable Fats Other than Cocoa Butter: Main Report." Prepared for the European Commission, DG Agriculture and Rural Development, New York, June 2006.

USAID. "Mali Food Security Update." *FEWS NET Mali*, February 2008. http://www.fews.net/docs/Publications/mali_2008_02eng.pdf.

USITC. *Sub-Saharan Africa: Factors Affecting Trade Patterns of Selected Industries, Second Annual Report*, USITC Publication 3989. Washington, DC: USITC, 2008.

World Bank. *Snapshot Africa: Ghana; Benchmarking FDI Competitiveness, 2006*. Washington, DC: World Bank Group and Multilateral Investment Guarantee Agency, January 2007.

Tropical Fruit

Dole Ocean Cargo Express. "Sailing Schedules," undated. <http://www.doleoceancargo.com/etrade.html> (accessed November 14, 2008).

Food and Agriculture Organization of the United Nations (FAO). FAOSTAT Global Production Database. <http://faostat.fao.org/site/567/default.aspx#ancor> (accessed various dates).

GTIS. Global Trade Atlas Database (accessed October 1, 2008).

Hapag-Lloyd. "Schedules," undated. <http://www.hapag-lloyd.com/en/index.html> (accessed December 3, 2008).

Maersk Line. "Route Schedules by Map-Africa," undated. http://www.maerskline.com/globalfile/?path=/pdf_maps/newnetwork/africa/WAF10_NB (accessed October 3, 2008).

Minot, Nicholas, and Margaret Ngigi. "Are Horticultural Exports a Replicable Success Story? Evidence from Kenya and Côte d'Ivoire." International Food Policy Research Institute and Egerton University. Conference paper no. 7. Presented at the Success in African Agriculture Conference, Pretoria, South Africa, December 1–2, 2003.

USITC. *Sub-Saharan Africa: Factors Affecting Trade Patterns of Selected Industries, Second Annual Report*, USITC Publication 3989. Washington, DC: USITC, 2008.

Natural Rubber

Adenikinju, Adeola. *Analysis of the Cost of Infrastructure Failures in a Developing Economy: The Case of the Electricity Sector in Nigeria*. African Economic Research Consortium. AERC Research Paper 148, February 2005.

Africa News. "Liberia: President Issues Executive Order," November 22, 2008.

———. "Nigeria: Common Tariff Will Kill Manufacturing Effort; Dunlop MD," July 29, 2007.

Baker, C.S.L., and W.S. Fulton. "Rubber, Natural." In *Kirk-Othmer Encyclopedia of Chemical Technology*, edited by Jacqueline I. Kroschwitz and Arza Seidel, 1–24. Hoboken, NJ: John Wiley and Sons, 1997.

BBC News. "Michelin to Close Nigerian Plant," January 18, 2007. <http://news.bbc.co.uk/2/hi/business/6274697.stm>.

Bogetic, Zeljko, and Issa Sanogo. "Infrastructure, Productivity and Urban Dynamics in Côte d'Ivoire: An Empirical Analysis and Policy Implications." World Bank. Africa Region Working Paper Series no. 86, July 2005.

Business Times (Singapore). "Olam, Wilmar in 50:50 African Joint Venture; They Will Make Three Initial Investments Totaling \$209USm," November 16, 2007.

GTIS. Global Trade Atlas Database (accessed December 18, 2008).

International Rubber Study Group (IRSG). "The African Rubber Industry." Secretariat Conference Paper, 2002.

———. *Rubber Statistics Bulletin* 62, nos. 4 and 5, January–February 2008.

Jones, Andrew. "Vietnam Mulls Africa Rubber Plantations To Feed U.S., Europe." *Dow Jones Asian Equities Report*, July 15, 2008.

OECD and AfDB. *African Economic Outlook 2007/2008*. Paris: OECD, 2008.

Rubber & Plastic News. "Houses of Liberian Legislature Ratify Pact with BFS Plant," April 14, 2008.

Tumanjong, Emmanuel. "Sinochem Intl To Be Major Consumer Of Cameroon Rubber: Report." *Dow Jones Commodities Service*, November 10, 2008.

U.S. Department of State. U.S. Embassy, Abidjan. "Response to Request for Information on Infrastructure Conditions (ABIDJAN 000682)," October 2, 2008.

USITC. *Sub-Saharan Africa: Factors Affecting Trade Patterns of Selected Industries, Second Annual Report*, USITC Publication 3989. Washington, DC: USITC, 2008.

World Bank. Doing Business Online Database. <http://www.doingbusiness.org> (accessed January 15, 2009).

Textiles and Apparel

Blanke, Jennifer, and Thea Chiesa. *The Travel & Tourism Competitiveness Report 2008: Balancing Economic Development and Environmental Sustainability*. Geneva, Switzerland: World Economic Forum, 2008.

Eskom Holdings Limited. *Together, Rising to the Challenge: Annual Report 2008*. Johannesburg, South Africa: Eskom, 2008.
http://financialresults.co.za/eskom_ar2008/ar_2008/downloads/eskom_ar2008.pdf.

GTIS. Global Trade Atlas Database (accessed October 1, 2008 and January 12, 2009).

Just-style.com editorial team. "South Africa: 640 Jobs to Go as SANS Fibres Closes," November 6, 2008. <http://www.just-style.com>.

Porter, Michael, and Klaus Schwab. *The Global Competitiveness Report 2008–2009*. Geneva, Switzerland: World Economic Forum, 2008.

Searates.com. "Statistical Data of Transit Time," undated.
<http://www.searates.com/container/transit/stat/?fsealine=10&fport1=706&fport2=15786&fport3=0&fport4=0&fport5=0&fport6=0&fport7=0> (accessed January 14, 2008).

Swaziland Electricity Board. "Tariff Rates for 2006 and 2007," undated.
<http://www.seb.co.sz/Tariffs.html> (accessed November 13, 2008).

U.S. Department of Commerce (USDOC). Office of Textiles and Apparel (OTEXA). "Trade Preference Programs, By Category, 11/2008 Data," November 2008. <http://otexa.ita.doc.gov/agoa-cbtpa/catv1.htm> (accessed October 9, 2008).

USITC. Hearing transcript in connection with inv. no. 332-477, *Sub-Saharan Africa: Effects of Infrastructure Conditions on Export Competitiveness, Third Annual Report*, October 28, 2008.

Leather

Abebe, Frew. "Time for Dry Port Service." *The Reporter*, November 1, 2008.
<http://en.ethiopianreporter.com/content/view/185/1/>.

EIU. *Country Profile 2008: Ethiopia*. London: Economist Intelligence Unit, 2008.

Embassy of India in Ethiopia. "Market Note on Ethiopian Leather and Leather Products," October 1, 2008. http://www.indianembassy.gov.et/FINAL_800by600/mar_ser/leather.htm.

Ethiopian Privatization Agency (EPA). *The Leather Industry Overview*, July 15, 2002.
<http://www.telecom.net.et/~epa/sectors/leather.html>.

GTIS. Global Trade Atlas Database (accessed January 30, 2009 and February 3, 2009).

International Council of Tanners (ICT). "Hide and Skin Quality," undated.
<http://www.tannerscouncil.org/hideskinquality.htm> (accessed January 9, 2009).

———. "Introduction to Leather," undated. <http://www.tannerscouncil.org/introtoleather.htm>
(accessed January 8, 2009).

———. "Perspective on Leather: Its Place in the World," undated.
<http://www.tannerscouncil.org/perspective.htm> (accessed January 9, 2009).

International Trade Centre. Leatherline African Platform. "Country Profile: Ethiopia," undated
<http://www.intracen.org/appli2/leather/africanplatform/default.aspx> (accessed September 12, 2008).

Pro-Poor Livestock Policy Initiative (PPLPI). "The Political Economy of Pro-Poor Livestock Policy Making in Ethiopia." PPLPI Working Paper no. 19, March 24, 2004.

Tadessem, Kirubel. "Ethiopia: House Imposes 150% Tax on Hide and Skin Exports," December 2, 2008.
http://nazret.com/blog/index.php?title=ethiopia_house_imposes_150_tax_on_hide_a&more=1&=1&tb=1&pb=1.

UNIDO. *A Blueprint for the African Leather Industry*. Addis Ababa, Ethiopia: UNIDO, 2004.

———. *A Strategic Action Plan for the Development of Ethiopian Leather and Leather Products Industry*. Volumes I and II. Addis Ababa, Ethiopia: UNIDO, 2005.

USITC. *Sub-Saharan Africa: Factors Affecting Trade Patterns of Selected Industries, Second Annual Report*, USITC Publication 3989. Washington, DC: USITC, 2008.

Van der Loop, Theo. "The Importance of the Leather Footwear Sector for Development in Ethiopia." RLDS Policy Brief no. 1, June 2003. Addis Ababa, Ethiopia: Addis Ababa University Printing Press.

World Bank. Doing Business Online Database. <http://www.doingbusiness.org> (accessed January 14, 2009).

Zenebe, Wudineh. "Ethiopia: Spicing Up of Dry Ports' Board to Speed Decision Making," September 9, 2008. <http://allafrica.com/stories/200809090598.html>.

Tourism

Ba, Demba, and Shaun Mann. "Tourism: An Opportunity to Unleash Shared Growth in Africa." World Bank, Note no. 16, July 2006.

http://www.siteresources.worldbank.org/EXTRAFRSUMAFIFS/Resources/note_16.pdf.

Business Monitor International. "Tourism Industry to Feel the Pinch," November 13, 2008.

http://www.fdi.net/bmi/bmidisplay.cfm?filename=OEMO_20081105_216120_xml.html.

Crilly, Rob. "After Violence, Kenya Tourism Struggles." *Christian Science Monitor*, March 4, 2008.

<http://www.csmonitor.com/2008/0304/p07s03-woaf.html>.

De Waal, Leandra. "Power Cut: Cable Car Panic." *News24.com*, January 22, 2008.

http://www.news24.com/News24/South_Africa/News/0,,2-7-1442_2256141.00.html.

EIU. *Country Profile: Kenya; Main Report, December 1, 2007*. London: Economist Intelligence Unit, 2007.

Gettleman, Jeffrey. "Kenyan Tourism Suffering Badly from Violence." *International Herald Tribune*, February 29, 2008. <http://www.ihf.com/articles/2008/02/29/africa/kenya.php>.

Government of the Republic of South Africa. Department of Trade and Industry (DTI). *Programme Guidelines, Enterprise Investment Programme, Tourism Support Programme*, July 4, 2008.

http://www.thedti.gov.za/teo/EIP_guidelines_tourism.pdf.

International Monetary Fund (IMF). International Financial Statistics Online Database.

<http://www.imfstatistics.org/imf/> (accessed October 29, 2008).

Kenya Tourist Board. "Corporate Strategic Plan 2005–2008," undated.

Lumiti, Cedric. "Country Moves to Create a Tourism Data Base." *East African Business Week*, February 2, 2009. <http://www.individual.com/story.php?story=95696142>.

———. "Kenya Tourism Yet to Recover." *East African Business Week*, November 2, 2008.

<http://www.busiweek.com>.

Macdonald, Shaun. "Don't Turn Out the Lights." *The Zimbabwean*, February 5, 2008.

http://www.thezimbabwean.co.uk/index.php?option=com_content&view=article&id=11005:dont-turn-out-the-lights&catid=32:zimbabwe%20tourism&Itemid=67.

- Mayoyo, Patrick. "Obama Father's Birth Place 'Kogelo Village' Declared Touristic Destination in Western Kenya." *MajimboKenya.com*, November 18, 2008.
<http://majimbokenya.com/home/2008/11/18/obama-fathers-birth-place-kogelo-village-declared-touristic-destination-in-western-kenya/>.
- Michaels, Daniel. "Travel Journal: Gambia's Tourism Woes; Sun, Sand and Peace Remain a Tough Sell in West African State." *Wall Street Journal Asia*, March 12, 2008.
- Naudé, W.A., and A. Saayman. "The Determinants of Tourist Arrivals in Africa: A Panel Data Regression Analysis." Paper prepared for the International Conference, Centre for the Study of African Economies, St. Catherine's College, University of Oxford, March 21–22, 2004.
- Tourism Review.com*. "Obama Effect: Great Help to Tourism Industry," November 25, 2008.
http://www.tourism-review.com/top_weekly_full.php?id=1235.
- Trans Africa Concessions Ltd. (TRAC). "Objectives and Benefits," undated.
http://www.tracn4.co.za/Company_Profile/Objectives_and_Benefits.aspx (accessed December 12, 2008).
- United Nations World Tourism Organization (UNWTO). *Yearbook of Tourism Statistics, 2008*. Madrid: World Tourism Organization, 2006.
- . *Yearbook of Tourism Statistics, 2007*. Madrid: World Tourism Organization, 2005.
- . *Yearbook of Tourism Statistics, 2006*. Madrid: World Tourism Organization, 2004.
- USAID and TechnoServe. "Tourism Industry Strategic Plan: Harnessing the Growth Potential in Swaziland's Tourism Industry." Discussion Document, December 2006.
- World Bank. "The Impact of the Financial Crisis on the Developing World." *World Bank Research Digest* 3, no. 2 (Winter 2009). http://siteresources.worldbank.org/DEC/Resources/84797-1154354760266/2807421-1222979971506/5435009-1222980080964/The_Impact_of_the_Financial_Crisis.pdf.
- . *Kenya: Unleashing the Potential for Trade and Growth*. Report no. 37688-KE, February 2007.
http://siteresources.worldbank.org/INTRANETTRADE/Resources/Kenya_DTIS.pdf.
- World Travel and Tourism Council. "Progress and Priorities, 2008/09," March 1, 2008.
http://www.wttc.org/bin/pdf/original_pdf_file/progress_and_priorities_2008.pdf.

APPENDIX A
Request Letter

EXECUTIVE OFFICE OF THE PRESIDENT
THE UNITED STATES TRADE REPRESENTATIVE
WASHINGTON, D.C. 20508

The Honorable Shara L. Aranoff
Chairman
U.S. International Trade Commission
500 E Street, S.W.
Washington, D.C. 20436

JUN 30 2008

Dear Chairman Aranoff:

On July 26, 2006, we requested that the U.S. International Trade Commission (Commission) prepare three annual reports on the factors affecting exports of selected industries in Sub-Saharan Africa (SSA). The Commission has delivered the first two annual reports, which were extremely useful and provided valuable information. We greatly appreciate the Commission's ongoing work.

As we continue to promote AGOA opportunities in sub-Saharan Africa, it would be helpful to have additional information on the factors affecting the competitiveness of SSA exports to the United States. Therefore, as a supplemental request under authority delegated to me by the President, and pursuant to section 332 (g) of the Tariff Act of 1930, as amended, I am requesting that the Commission provide in its third report, an analysis of the effect that conditions in key infrastructure sectors have on the export competitiveness of select SSA industries, particularly but not limited to, industries considered in the previous two studies.

The analysis should include a brief overview of the effect of infrastructure conditions generally, and a more indepth analysis of the effect of conditions in infrastructure sectors (land transport, maritime transport, and electricity) that were identified by the Commission staff in the previous two studies as having a significant effect on the export competitiveness of many SSA industries.

Consistent with the request of July 26, 2006, I request that the third annual report be delivered no later than April 3, 2009. I anticipate that the Commission's report will be made available to the public in its entirety. Therefore, the Report should not contain any confidential business or national security information.

Thank you for your valuable advice and assistance. I look forward to reviewing your report.

Sincerely,



Susan C. Schwab

APPENDIX B
Federal Register Notice

antidumping and countervailing duty investigations within 45 days, or in this case by September 15, 2008. The Commission's views are due at Commerce within five business days thereafter, or by Monday, September 22, 2008.

For further information concerning the conduct of this investigation and rules of general application, consult the Commission's Rules of Practice and Procedure, part 201, subparts A through E (19 CFR part 201), and part 207, subparts A and B (19 CFR part 207).

EFFECTIVE DATE: July 31, 2008.

FOR FURTHER INFORMATION CONTACT: Joanna Lo (202-205-1888), Office of Investigations, U.S. International Trade Commission, 500 E Street, SW., Washington, DC 20436. Hearing-impaired persons can obtain information on this matter by contacting the Commission's TDD terminal on 202-205-1810. Persons with mobility impairments who will need special assistance in gaining access to the Commission should contact the Office of the Secretary at 202-205-2000. General information concerning the Commission may also be obtained by accessing its Internet server (<http://www.usitc.gov>). The public record for this investigation may be viewed on the Commission's electronic docket (EDIS) at <http://edis.usitc.gov>.

SUPPLEMENTARY INFORMATION:

Background.—These investigations are being instituted in response to a petition filed on July 31, 2008, by Nashville Wire Products Inc., Nashville, TN, SSW Holding Company, Inc., Elizabethtown, KY, the United Steel, Paper and Forestry, Rubber, Manufacturing, Energy, Allied-Industrial and Service Workers International Union, and the International Association of Machinists and Aerospace Workers, District Lodge 6, Clinton, IA.

Participation in the investigation and public service list.—Persons (other than petitioners) wishing to participate in these investigations as parties must file an entry of appearance with the Secretary to the Commission, as provided in sections 201.11 and 207.10 of the Commission's rules, not later than seven days after publication of this notice in the *Federal Register*. Industrial users and (if the merchandise under investigation is sold at the retail level) representative consumer organizations have the right to appear as parties in Commission countervailing duty and antidumping investigations. The Secretary will prepare a public service list containing the names and addresses of all persons, or their

representatives, who are parties to these investigations upon the expiration of the period for filing entries of appearance.

Limited disclosure of business proprietary information (BPI) under an administrative protective order (APO) and BPI service list.—Pursuant to section 207.7(a) of the Commission's rules, the Secretary will make BPI gathered in these investigations available to authorized applicants representing interested parties (as defined in 19 U.S.C. 1677(9)) who are parties to the investigations under the APO issued in the investigations, provided that the application is made not later than seven days after the publication of this notice in the *Federal Register*. A separate service list will be maintained by the Secretary for those parties authorized to receive BPI under the APO.

Conference.—The Commission's Director of Operations has scheduled a conference in connection with these investigations for 9:30 a.m. on August 21, 2008, at the U.S. International Trade Commission Building, 500 E Street, SW., Washington, DC. Parties wishing to participate in the conference should contact Joanna Lo (202-205-1888) not later than August 18, 2008, to arrange for their appearance. Parties in support of the imposition of countervailing or antidumping duties in these investigations and parties in opposition to the imposition of such duties will each be collectively allocated one hour within which to make an oral presentation at the conference. A nonparty who has testimony that may aid the Commission's deliberations may request permission to present a short statement at the conference.

Written submissions.—As provided in sections 201.8 and 207.15 of the Commission's rules, any person may submit to the Commission on or before August 26, 2008, a written brief containing information and arguments pertinent to the subject matter of these investigations. Parties may file written testimony in connection with their presentation at the conference no later than three days before the conference. If briefs or written testimony contain BPI, they must conform with the requirements of sections 201.6, 207.3, and 207.7 of the Commission's rules. The Commission's rules do not authorize filing of submissions with the Secretary by facsimile or electronic means, except to the extent permitted by section 201.8 of the Commission's rules, as amended, 67 FR 68036 (November 8, 2002). Even where electronic filing of a document is permitted, certain documents must also be filed in paper form, as specified in II(C) of the

Commission's Handbook on Electronic Filing Procedures, 67 FR 68168, 68173 (November 8, 2002).

In accordance with sections 201.16(c) and 207.3 of the rules, each document filed by a party to these investigations must be served on all other parties to the investigations (as identified by either the public or BPI service list), and a certificate of service must be timely filed. The Secretary will not accept a document for filing without a certificate of service.

Authority: These investigations are being conducted under authority of title VII of the Tariff Act of 1930; this notice is published pursuant to section 207.12 of the Commission's rules.

By order of the Commission.

Issued: August 1, 2008

Marilyn R. Abbott,

Secretary to the Commission.

[FR Doc. E8-18118 Filed 8-6-08; 8:45 am]

BILLING CODE 7020-02-P

INTERNATIONAL TRADE COMMISSION

[Investigation No. 332-477]

Sub-Saharan Africa: Effects of Infrastructure Conditions on Export Competitiveness, Third Annual Report

AGENCY: United States International Trade Commission.

ACTION: Scheduling of third annual report and public hearing; change in focus and title of third report; and indication of sub-Saharan African industries that may be covered.

SUMMARY: In response to a supplemental letter dated June 30, 2008, from the United States Trade Representative (USTR) covering the third report in this series, the Commission has changed the focus and title of its third report and will examine the effect that conditions of key infrastructure sectors have on the export competitiveness of select sub-Saharan African (SSA) industries. This notice announces the scheduling of the third and final report in this series, the SSA industries that may be covered, and the scheduling of a public hearing. This series of reports was originally requested in a letter from the USTR dated July 26, 2006. In response, the Commission instituted investigation No. 332-477 and delivered its first and second reports on April 3, 2007, and April 3, 2008, respectively, under the investigation title *Sub-Saharan Africa: Factors Affecting Trade Patterns of Selected Industries*.

October 1, 2008: Deadline for filing requests to appear at the public hearing.

October 7, 2008: Deadline for filing pre-hearing briefs and statements.

October 28, 2008: Public hearing.

November 4, 2008: Deadline for filing post-hearing briefs and statements.

April 3, 2009: Transmittal of Commission report to USTR.

ADDRESSES: All Commission offices, including the Commission's hearing rooms, are located in the United States International Trade Commission Building, 500 E Street, SW., Washington, DC. All written submissions should be addressed to the Secretary, United States International Trade Commission, 500 E Street, SW., Washington, DC 20436. The public record for this investigation may be viewed on the Commission's electronic docket (EDIS) at <http://www.usitc.gov/secretary/edis.htm>.

FOR FURTHER INFORMATION CONTACT:

Co-project leaders Erland Herfindahl (202-205-2374 or erland.herfindahl@usitc.gov) or Alan Treat (202-205-3426 or alan.treat@usitc.gov) for information specific to this report. For information on the legal aspects of this investigation, contact William Gearhart of the Commission's Office of the General Counsel (202-205-3091 or william.gearhart@usitc.gov). The media should contact Margaret O'Laughlin, Office of External Relations (202-205-1819 or margaret.olaughlin@usitc.gov). Hearing-impaired individuals may obtain information on this matter by contacting the Commission's TDD terminal at 202-205-1810. General information concerning the Commission may also be obtained by accessing its Internet server (<http://www.usitc.gov>). Persons with mobility impairments who will need special assistance in gaining access to the Commission should contact the Office of the Secretary at 202-205-2000.

Background: As indicated above, this notice concerns the final of three annual reports that the USTR requested the Commission provide concerning factors affecting trade patterns of selected industries in SSA countries. In the initial request letter of July 26, 2006, the USTR described the type of information that the Commission should provide in its reports with respect to each industry and identified the industries and products produced to be covered in the first annual report. The letter indicated that USTR would provide additional lists of industries and products produced for each of the second and third annual reports. The letter asked that the Commission deliver its three reports by April 3, 2007, April 3, 2008, and April 3, 2009, respectively. The

Commission published notice of institution of this investigation in the *Federal Register* on August 29, 2006 (71 FR 51212), and delivered its first and second reports to USTR on April 3, 2007 and April 3, 2008, respectively.

On June 30, 2008, the Commission received a supplemental letter from the USTR requesting that the Commission provide, in its third report, an analysis of the effect that conditions in key infrastructure sectors have on the export competitiveness of select SSA industries, particularly but not limited to, industries considered in the previous two reports. The USTR asked that the Commission's analysis include a brief overview of the effect of infrastructure conditions generally, and a more in-depth analysis of the effect of conditions in infrastructure sectors (land transport, maritime transport, and electricity) that were identified by the Commission in the previous two reports as having a significant effect on the export competitiveness of many SSA industries. To address the effect of conditions in these infrastructure sectors on the export competitiveness of SSA industries, the Commission's report may include analysis with respect to the following industries: (1) In the agriculture sector, coffee, shea butter, and tropical fruits (e.g., bananas and pineapples); (2) in the mining and manufacturing sector, natural rubber and downstream products thereof, textiles and apparel, and leather; and (3) in the services sector, tourism services.

Public Hearing: A public hearing in connection with this investigation will be held beginning at 9:30 a.m. on October 28, 2008, at the United States International Trade Commission Building, 500 E Street, SW., Washington DC. Requests to appear at the hearing should be filed with the Secretary no later than 5:15 p.m., October 1, 2008, in accordance with the requirements in the "Written Submissions" section below. In the event that, as of the close of business on October 1, 2008, no witnesses are scheduled to appear at the hearing, the hearing will be canceled. Any person interested in attending the hearing as an observer or nonparticipant may call the Secretary to the Commission (202-205-2000) after October 1, 2008, for information concerning whether the hearing will be held.

Written Submissions: In lieu of or in addition to participating in the hearing, interested parties are invited to submit written statements or briefs concerning this investigation. All written submissions, including requests to appear at the hearing, statements, and briefs, should be addressed to the

Secretary. Any pre-hearing statements or briefs should be filed not later than 5:15 p.m., October 7, 2008; and post-hearing statements and briefs and all other written submissions should be filed not later than 5:15 p.m., November 4, 2008. All written submissions must conform with the provisions of section 201.8 of the Commission's *Rules of Practice and Procedure* (19 CFR 201.8). Section 201.8 of the rules requires that a signed original (or a copy designated as an original) and fourteen (14) copies of each document be filed. In the event that confidential treatment of the document is requested, at least four (4) additional copies must be filed, in which the confidential information must be deleted (see the following paragraph for further information regarding confidential business information). The Commission's rules do not authorize filing submissions with the Secretary by facsimile or electronic means, except to the extent permitted by section 201.8 of the rules (see *Handbook for Electronic Filing Procedures*, http://www.usitc.gov/secretary/fed_reg_notices/rules/documents/handbook_on_electronic_filing.pdf); persons with questions regarding electronic filing should contact the Secretary at 202-205-2000. Any submissions that contain confidential business information must also conform with the requirements of section 201.6 of the Commission's *Rules of Practice and Procedure* (19 CFR 201.6). Section 201.6 of the rules requires that the cover of the document and the individual pages be clearly marked as to whether they are the "confidential" or "non-confidential" version, and that the confidential business information be clearly identified by means of brackets. All written submissions, except for confidential business information, will be made available in the Office of the Secretary to the Commission for inspection by interested parties.

In the initial request letter (and reaffirmed in her letter of June 30, 2008), the USTR stated that her office intends to make the Commission's reports in this investigation available to the public in their entirety, and asked that the Commission not include any confidential business or national security information in its reports. Consequently, the reports that the Commission sends to the USTR will not contain any such information. Any confidential business information received by the Commission in this investigation and used in preparing its reports will not be published in a manner that would reveal the operations of the firm supplying the information.

Issued: July 31, 2008.

By order of the Commission.

Marilyn R. Abbott,

Secretary to the Commission.

[FR Doc. E8-18051 Filed 8-6-08; 8:45 am]

BILLING CODE 7020-02-P

DEPARTMENT OF JUSTICE

Notice of Lodging of Consent Decree Under the Clean Water Act

Notice is hereby given that on July 31, 2008, a proposed Consent Decree (the "Decree") in *United States v. Bacardi Corporation*, Civil Action No. 3:08-cv-1825 was lodged with the United States District Court for the District of Puerto Rico.

In a complaint, filed simultaneously with the Decree, the United States charged that Bacardi Corporation ("Bacardi") violated the Clean Water Act, 33 U.S.C. 1251 *et seq.*, at its facility in Cataño, Puerto Rico ("Facility") by discharging pollutants in excess of effluent limitations contained in its National Pollutant Discharge Elimination System ("NPDES") Permit No. PR0000591, by failing to report results of sampling conducted by Bacardi, including violations of effluent limitations, and by failing to conduct toxicity testing and report the results of such testing as required by NPDES Permit No. PR0000591.

Pursuant to the Decree, Bacardi will implement a number of compliance measures, including enhanced monitoring of certain pollutants in the Facility's effluent and developing and implementing a plan of action to address exceedances of the effluent limitations for bacterial pollutants. If Bacardi exceeds any effluent limitation prior to termination of the Decree, such exceedance may trigger a requirement to implement further compliance measures.

Bacardi will pay a \$550,000 civil monetary penalty to the United States pursuant to the Decree. Bacardi must also carry out a land preservation supplemental environmental project, the value of which is estimated at approximately \$1,000,000. Specifically, Bacardi will transfer title to a parcel of land containing wetlands, located in the watershed of Cienega Las Cucharillas in Cataño, Puerto Rico, to a non-profit group, and require the attachment of deed restrictions, covenants and/or easements to ensure the land is perpetually maintained as a protected area. This land preservation project will assist in restoring the ecosystem, provide environmental and public health protection, and enable the

ecological resources of Cienega Las Cucharillas and nearby mangrove forest and wetland areas to be maintained and protected to ensure future environmental benefits.

The Department of Justice will receive, for a period of thirty (30) days from the date of this publication, comments relating to the Decree. Comments should be addressed to the Assistant Attorney General, Environment and Natural Resources Division, and either e-mailed to pubcomment-ees.enrd@usdoj.gov or mailed to P.O. Box 7611, U.S. Department of Justice, Washington, DC 20044-7611, and should refer to *United States v. Bacardi Corporation*, D.J. Ref. 90-5-1-1-08983.

The Decree may be examined at the Office of the United States Attorney, Torre Chardón, Room 1201, 350 Chardón Street, San Juan, Puerto Rico 00918, and at U.S. EPA Region 2, Office of Regional Counsel, 290 Broadway, New York, New York 10007-1866. During the public comment period, the Decree may also be examined on the following Department of Justice Web site, http://www.usdoj.gov/enrd/Consent_Decrees.html. A copy of the Decree may also be obtained by mail from the Consent Decree Library, P.O. Box 7611, U.S. Department of Justice, Washington, DC 20044-7611 or by faxing or e-mailing a request to Tonia Fleetwood (tonia.fleetwood@usdoj.gov), fax no. (202) 514-0097, phone confirmation number (202) 514-1547. In requesting a copy from the Consent Decree Library, please enclose a check in the amount of \$14.25 (25 cents per page reproduction cost) payable to the U.S. Treasury or, if by e-mail or fax, forward a check in that amount to the Consent Decree Library at the stated address.

Ronald Gluck,

Assistant Chief, Environmental Enforcement Section, Environment and Natural Resources Division.

[FR Doc. E8-18053 Filed 8-6-08; 8:45 am]

BILLING CODE 4410-15-P

DEPARTMENT OF LABOR

Office of the Secretary

Submission for OMB Review: Comment Request

July 31, 2008.

The Department of Labor (DOL) hereby announces the submission of the following public information collection requests (ICR) to the Office of Management and Budget (OMB) for review and approval in accordance with

the Paperwork Reduction Act of 1995 (Pub. L. 104-13, 44 U.S.C. chapter 35). A copy of each ICR, with applicable supporting documentation, including among other things a description of the likely respondents, proposed frequency of response, and estimated total burden, may be obtained from the RegInfo.gov Web site at <http://www.reginfo.gov/public/do/PRAMain> or by contacting Darrin King on 202-693-4129 (this is not a toll-free number)/e-mail: king.darrin@dol.gov.

Interested parties are encouraged to send comments to the Office of Information and Regulatory Affairs, Attn: OMB Desk Officer for the Employment Standards Administration (ESA), Office of Management and Budget, Room 10235, Washington, DC 20503, Telephone: 202-395-7316/Fax: 202-395-6974 (these are not toll-free numbers), e-mail:

OIRA_submission@omb.eop.gov within 30 days from the date of this publication in the *Federal Register*. In order to ensure the appropriate consideration, comments should reference the OMB Control Number (see below).

The OMB is particularly interested in comments which:

- Evaluate whether the proposed collection of information is necessary for the proper performance of the functions of the agency, including whether the information will have practical utility;
- Evaluate the accuracy of the agency's estimate of the burden of the proposed collection of information, including the validity of the methodology and assumptions used;
- Enhance the quality, utility, and clarity of the information to be collected; and
- Minimize the burden of the collection of information on those who are to respond, including through the use of appropriate automated, electronic, mechanical, or other technological collection techniques or other forms of information technology, e.g., permitting electronic submission of responses.

Agency: Employment Standards Administration.

Type of Review: Extension without change of a currently approved collection.

Title of Collection: FECA Medical Report Forms, Claim for Compensation. OMB Control Number: 1215-0103.

Form Numbers: CA-7; CA-17; CA-16; CA-20; CA-1331; CA-1332; OWCP-5A; OWCP-5B; and OWCP-5C.

Total Estimated Number of Respondents: 294,540.

Total Estimated Annual Burden Hours: 30,493.

APPENDIX C
List of Hearing Participants

CALENDAR OF PUBLIC HEARING

Those listed below appeared as witnesses at the United States International Trade Commission's hearing:

Subject: Sub-Saharan Africa: Effects of Infrastructure Conditions on Export Competitiveness, Third Annual Report

Inv. No.: 332-477

Date and Time: October 28, 2008 - 9:30 a.m.

Sessions were held in connection with this investigation in the Main Hearing Room (room 101), 500 E Street, S.W., Washington, D.C.

EMBASSY APPEARANCE:

**Embassy of the Kingdom of Lesotho
Washington, D.C.**

His Excellency David Rantekoa, Ambassador of the Kingdom of Lesotho to the United States of America

ORGANIZATION AND WITNESS:

The Honorable Christopher E. Goldthwait,
Former U.S. Ambassador to Chad

Audrey Adams, Border Management and Customs Consultant
working on USAID funded projects

African Coalition for Trade, Inc.
Washington, D.C.

Paul Ryberg, President

TechnoServe
Washington, D.C.

Scott Clark, Senior Program Manager, Africa Division

ORGANIZATION AND WITNESS:

General Electric
Washington, D.C.

Timothy J. Richards, Managing Director, International
Energy Policy

Nathan Associates Inc.
Arlington, VA

Paul E. Kent, Ph.D., Vice President, Infrastructure
Planning and Economics

-END-

APPENDIX D

Summary of Views of Interested Parties

Summary of Views of Interested Parties

The Commission held a public hearing on October 28, 2008, and also invited interested persons to file written submissions. This appendix provides summaries of hearing testimony and written submissions for each interested party.¹

Embassy of the Kingdom of Lesotho²

In hearing testimony presented before the Commission, His Excellency David Mohlomi Rantekoa, Lesotho's Ambassador to the United States, described the conditions of Lesotho's infrastructure and its importance to the competitiveness of key industries, such as apparel. Ambassador Rantekoa noted that Lesotho is a landlocked country, completely surrounded by South Africa, and therefore dependent on South Africa's land and maritime transportation system, and to a lesser extent, its electrical system. He said that the country's largest trading partner is the United States, overwhelmingly due to apparel exports under AGOA.

The ambassador provided a summary overview of the apparel industry in Lesotho and related infrastructure issues. The apparel industry is the largest formal sector employer in Lesotho, directly employing approximately 46,000 individuals, as well as many more indirectly. It takes approximately 45 days in order to transport apparel products from factories in Lesotho to the U.S. market. Part of the delay in exporting goods out of the country stems from "soft" infrastructure impediments, such as customs procedures at the border between Lesotho and South Africa, and also from physical infrastructure constraints, such as the lack of an adequate bridge linking the apparel producing region of Mafeteng to nearby transportation routes in South Africa.

The ambassador stated electricity and other infrastructure services are relatively scarce and expensive in Lesotho. He also stated that the country generates most of its own electricity, but also imports some from South Africa. In recent years, demand for electricity has outstripped supply, resulting in load-shedding and higher costs for firms, which are compelled to use costly diesel generators. These conditions have constrained economic growth. There is also a lack of sufficient water services and information and communication services in the country, although funding from the Millennium Challenge Corporation will target both of these vital sectors.

The ambassador recommended several steps to address infrastructure constraints in Lesotho, including devoting more trade capacity-building funds to physical infrastructure, encouraging more public-private partnerships, and placing a greater emphasis on regional cooperation for infrastructure issues.

¹ In many instances, the appendix reflects only the principal points made by the particular party. The views expressed in the summarized materials should be considered to be those of the submitting parties and not the Commission. In preparing this summary, Commission staff did not undertake to confirm the accuracy of, or otherwise correct, the information summarized. For the full text of hearing testimony and written submissions, see entries associated with Investigation No. 332-477 (2008) at the Commission's Electronic Docket Information System (<http://searchapp.usitc.gov/edis3/app>).

² USITC, Hearing transcript, October 28, 2008, 6-17.

Christopher E. Goldthwait, former U.S. Ambassador to Chad³

In written and hearing testimony presented to the Commission, the Honorable Christopher Goldthwait, former U.S. Ambassador to Chad (1999–2004), described how poor conditions in Chad’s road and electricity infrastructure constrain the country’s social and economic development, and also how poor infrastructure conditions affect the export competitiveness of various industries in Chad. He cited the lack of adequate road infrastructure and insufficient trucking capacity as the largest obstacles to both social and economic development in the country. For example, the poor road infrastructure limits the population’s access to education because it is difficult for teachers to travel to and from the capital city of N’Djamena during the rainy season. Similarly, people with limited capacity to travel long distances face difficulties reaching the few medical care facilities within the country.

The former ambassador explained that large regions of Chad are effectively cut off from one another during the rainy season, and that there is limited capacity to transport commodities between different regions. As a result, it is often easier to import commodities such as grain to a region within Chad, than to transport them from a region within Chad that has a surplus. Ambassador Goldthwait noted that Chad has no national electricity grid. Few cities have public electricity generation, and power is generally produced from imported generators and diesel fuel. As a result, Chad has one of the highest electricity costs in the world.

The former ambassador also described how poor road conditions and high electricity costs affect the export competitiveness of Chad’s livestock, sugar, and textiles industries. He noted that over one-third of Chad’s population is dependent on nomadic herding, with animals driven by hoof over large distances to reach a handful of markets within the country. Animals lose weight, and many die along the way, whether they are driven to domestic markets or for export to Nigeria. As a result, herders lose revenue and export volumes are lower than would be the case if animals were transported by truck over all-weather roads.

He noted that high power costs make Chad’s textiles industry less competitive than textiles produced in neighboring countries. He further noted that Chad no longer exports cut and chilled meats to neighboring countries largely because of prohibitively high electricity costs and a lack of cold-storage trucking capacity.

Audrey Adams, Border Management and Customs Consultant⁴

In her oral testimony presented before the Commission, Ms. Adams stated that she is a retired senior executive from U.S. Customs and Border Protection with over 35 years of experience managing border crossings between the United States and Mexico. Ms.

³ Goldthwait, Written testimony to the USITC, September 22, 2008; USITC, Hearing transcript, October 28, 2008, 32–38.

⁴ USITC, Hearing transcript, October 28, 2008, 39–46.

Adams described various border management practices that could be used to help improve economic security and export competitiveness through enhanced trade facilitation in SSA.

Ms. Adams stated that it is prudent to review the procedures, or “soft” infrastructure, that are in place at various border crossing points in order to understand reasons for border crossing delays. She said that a one-stop border post is an important step to develop the full potential of land transport corridors with truly seamless borders, because such posts reduce costs by decreasing transaction times and redundant bureaucracy between two countries. In addition, by eliminating the need for duplicate handling, the potential for cargo damage is significantly reduced. She also indicated that a one-stop border post creates opportunities for data sharing and potential savings to both industry and government.

Ms. Adams explained that, by submitting cargo information to border management authorities in advance of arrival, border managers would be able to better assess the risk of a specific shipment and allocate inspection time and effort. She expressed the view that low-risk shipments can and should be allowed to proceed with only minimal government intervention.

Ms. Adams stated that there are challenges that need to be addressed in order to create a viable one-stop border processing point, and that the decision to develop one-stop border posts is particular to individual countries, adding that government officials in many developing countries insist that all cargo must be examined. She stated further that electronic systems for data exchange can be developed rather easily, and that individual ministries and countries should be made aware of the benefits of electronic data exchange. Ms. Adams underscored the need for collaboration, transparency, and funding for the construction of the necessary facilities and electronic infrastructure.

Paul Ryberg, President, Africa Coalition for Trade, Inc.⁵

In his hearing testimony, Mr. Ryberg, president of the Africa Coalition for Trade, Inc. (ACT), stated that ACT is a nonprofit association representing private-sector African companies that export to the United States under AGOA. Mr. Ryberg indicated that ACT has been involved in the development, implementation, and amendment of AGOA, and acts as one of the main spokespersons for the African private sector.

Mr. Ryberg stated that the duty-free preferences under AGOA have helped improve the export competitiveness of various sectors, especially the textiles and apparel sector, where U.S. imports of textiles and apparel from AGOA beneficiaries increased by almost 300 percent during the first five years of AGOA (2001–05). He noted that the growth in textiles and apparel trade was not widely dispersed among AGOA beneficiaries. Rather, it was concentrated in six countries—Lesotho, Kenya, Madagascar, Swaziland, South Africa, and Mauritius—which together accounted for 90 percent of apparel exports to the United States. He stated that infrastructure conditions and geographic location are key determinants of the competitive position of SSA textiles and apparel producers.

⁵ USITC, Hearing transcript, October 28, 2008, 47–53.

Mr. Ryberg noted that, with the exception of Lesotho and Swaziland, which are surrounded by South Africa, the successful apparel exporting countries under AGOA are all coastal countries, and, therefore, are not subject to the high inland transportation costs and potential delays of transporting goods from landlocked countries to coastal ports for export. He said that high inland transportation costs and long delays have generally prevented landlocked SSA countries from significantly increasing apparel exports to the United States under AGOA. He cited three exceptions, Botswana, Malawi, and Uganda, and noted that their increased exports under AGOA were all from relatively small bases compared to coastal SSA countries.

Mr. Ryberg stated that textile production is highly capital intensive and requires access to reliable supplies of electricity and clean water—in short, adequate and reliable infrastructure. He stated that textile production is even more concentrated than apparel production, with just South Africa, Mauritius, and Lesotho having significantly increased textile production and exports in response to AGOA. Mr. Ryberg noted that these countries have relatively superior infrastructure compared to their neighbors.

Mr. Ryberg said that there is a clear connection between having a successful textile industry and a successful apparel industry. He indicated that apparel production becomes more competitive when it is vertically integrated with on-site or nearby textile production to reduce or eliminate transport costs, time delays, and other costs associated with sourcing inputs from far distances. However, because textile production is dependent on relatively advanced infrastructure, such as adequate and reliable transportation, electricity, and water infrastructure, Mr. Ryberg expressed the view that prospects for rapidly expanded vertical integration with the downstream apparel sector are dim. As a result, he expects that SSA's apparel sector will continue to be at a competitive disadvantage versus other regions due in large part to the constraints imposed by poor infrastructure conditions.

Scott Clark, Senior Program Manager, Africa Division, TechnoServe⁶

In his testimony before the Commission, Mr. Clark stated that TechnoServe is a nonprofit organization that provides business training to small companies in poor rural areas of the developing world in order to build businesses, create income, and improve economic growth. He said that TechnoServe is funded by the U.S. government, foundations, and corporations.

Mr. Clark indicated that, in SSA, TechnoServe operates in East, West, and southern Africa, and has worked to improve the competitiveness of the coffee, shea butter, and tropical fruit sectors. In Tanzania, TechnoServe works with small-holder coffee farmers to improve the production and preprocessing stages of coffee. Mr. Clark stated that one of the principal challenges to coffee production is transport delays caused by poor feeder roads, which increase the amount of time it takes farmers to transport coffee cherries to processing facilities. He noted that time is a critical factor because if cherries are not pulped within eight hours of picking, the quality of the coffee bean is compromised. He further noted that the washing of coffee requires electricity, which is virtually nonexistent

⁶ USITC, Hearing transcript, October 28, 2008, 53–58.

in most rural areas of SSA or sufficiently unreliable such that diesel generators are used instead.

Mr. Clark stated that TechnoServe is focused on improving the quality of shea nuts and shea butter in Ghana for export. He noted that the majority of shea butter is used as a substitute for cocoa butter in the production of chocolate in export markets. Mr. Clark stated that most shea nuts are collected largely by women in poor rural areas of northern Ghana, consolidated at markets, and processed at large-scale processors in Ghana or exported for processing in Europe. TechnoServe's aim is to have more women process the shea nuts themselves to locally capture the value added. Mr. Clark noted that adequate and reliable electricity is a principal challenge facing small-scale processors; many small-scale processors rely on expensive diesel generators.

With respect to tropical fruit, Mr. Clark stated that TechnoServe is active in Kenya, Uganda, and Tanzania. He stated that adequate cold storage along the supply chain is critical to maintaining the quality of the fruit. Mr. Clark noted that fruit is harvested early in the morning before the temperature rises, and that the fruit is transported to pack houses on feeder roads that are often of very poor quality. This results, he explained, in a fair amount of damage to the fruit, leading to increased rejection rates of fruit destined for export.

Timothy Richards, Managing Director, International Energy Policy, General Electric Company⁷

In hearing testimony presented before the Commission, Mr. Richards highlighted the history of electricity policy in SSA and its implications for economic development, and steps that African governments should pursue in order to increase the availability and reliability of electricity within their countries. General Electric (GE) has a long history of involvement in the electricity sector in SSA, both as a provider of power-generating equipment to domestic utilities and independent power producers (IPPs) and in its role as an investor in individual power projects.

Mr. Richards noted that electricity is a crucial component of economic and business development, and that SSA as a region is currently underserved in terms of the availability and reliability of electricity. He attributes this lack of sufficient electricity supplies to problems related to the management and regulation of electric utilities in Africa. He said that electricity in SSA historically was provided by state-owned monopolies, which charged artificially low rates and suffered from political interference in hiring and management. Starting in the 1990s, multilateral development banks encouraged privatization and the participation of IPPs. He said that the pricing structure established in most countries was not sustainable; IPPs charged market-based rates to electric utilities for wholesale power, but the utilities charged below cost rates to consumers. He indicated that this ultimately led to pressure on IPPs to renegotiate rates, and caused many foreign investors who controlled the IPPs to divest their assets.

He said that even South Africa, the country with the largest power generation capacity in SSA, recently faced shortages of electricity due to electricity demand expanding more

⁷ USITC, Hearing transcript, October 28, 2008, 58–66.

rapidly than supply. He noted that oil- and gas-rich Nigeria has had difficulty generating sufficient quantities of electricity; GE recently supplied the country with gas turbines, but the turbines have not yet been installed due to difficulties with the installation contracts. He said that Ghana has one of the highest electricity rates on the continent, but businesses are still hampered by outages.

Mr. Richards suggested several steps to mitigate the current situation. According to Mr. Richards, electric utilities must be able to generate positive returns, and have the power to make long-term investment decisions. He indicated that this requires a regulatory system that allows for sufficiently high electricity prices such that firms can fund further investment in the electric systems.

Paul Kent, Vice President Infrastructure Planning and Economics, Nathan Associates⁸

In his hearing testimony, Dr. Kent stated that he is a port specialist with Nathan Associates, an economic consulting firm. Dr. Kent indicated that he has experience working on port reform in 40 countries worldwide, including six in SSA. Dr. Kent described the importance of ports to economic development and the current state of African ports, and listed steps that could mitigate the problems associated with poor port performance in SSA.

Dr. Kent noted that there are a number of recently published economic studies that show a strong relationship between economic and trade performance and infrastructure conditions. He cited in particular a recent paper by Kent and Fox that estimates that the removal of port inefficiencies could increase annual GDP growth by 0.47 percent. Additionally, he cited a recent World Bank study that shows that delays in shipment time effectively increase the economic distance between countries.

Dr. Kent also noted that ports in SSA are characterized by a number of problems, including lengthy berth waiting times, slow vessel turnaround times, and long cargo dwell times. There are also problems with truck connections from the ports due to an imbalance of trade flows and other factors. He attributed the inefficiencies and delays partly to a lack of effective economic regulation in conjunction with monopoly port operators. With the expansion of the Panama Canal, Dr. Kent expects vessel size to increase, resulting in lower frequency of port calls and higher volumes. He said that this will increase the pressure on port infrastructure at peak times. Simultaneously, higher fuel costs are increasing transportation costs generally, resulting in countries focusing more on regional trade.

To mitigate these problems, Dr. Kent maintains that transportation corridor competition should be increased, port concessions should be properly structured to regulate against anticompetitive behavior by operators, truck visits to ports should be scheduled to alleviate traffic congestion, and appropriate infrastructure should be developed, such as inland ports and truck staging areas.

⁸ USITC, Hearing transcript, October 28, 2008, 67–75.

Vijaya Ramachandran, Senior Fellow, Center for Global Development⁹

In written testimony submitted to the Commission, Dr. Vijaya Ramachandran, senior fellow, Center for Global Development, stressed the importance of U.S. support for the development of African infrastructure. She stated that Africa's private sector, and hence economic growth, is hindered by critical deficiencies in the power and road sectors.

Dr. Ramachandran noted that, in many African countries, energy as a share of total business costs is much higher than in countries such as China. In order to alleviate this situation, she suggested that the United States support a "Clean Infrastructure Initiative," which would focus on producing electricity from renewable sources. Dr. Ramachandran added that Africa has an abundance of potential sources for renewable energy production, including wind, solar, hydro, and biomass. She indicated that harnessing these sources of energy would allow Africa to avoid air and water pollution associated with coal, and also provide a viable solution to the challenges of providing off-grid power supplies to remote populations. She suggested that the United States encourage investment in clean energy development via the Overseas Private Investment Corporation, which could establish a \$1 billion Clean Energy Fund for Africa to provide guarantees and facilitate technology transfers.

Dr. Ramachandran also suggested that the United States provide support to multilateral institutions such as the African Development Bank and the World Bank in order to build and maintain a trans-African road network. She noted that the African Development Bank has proposed road networks to connect all African capitals and cities with more than 500,000 residents. She added that best-practice models and technical expertise exist within multilateral institutions for dealing with the complexities—such as corruption concerns, environmental concerns, and maintenance funding mechanisms—of building major road networks.

⁹ Ramachandran, Written testimony to the USITC, October 27, 2008.

APPENDIX E

Trading Across Borders Indicators: Sub-Saharan Africa

TABLE E.1 World Bank Doing Business indicators: Trading Across Borders (imports) in sub-Saharan Africa, 2009

Economy	Rank			Trading Across Borders		
	In SSA	Overall trading across borders ^a	Overall ease of doing business ^a	Documents for import (number) ^b	Time for import (days) ^c	Cost to import (US \$ per container) ^d
Mauritius	1	20	24	6	16	677
Cape Verde	2	56	143	5	18	1,129
Senegal	3	60	149	5	18	1,920
The Gambia	4	73	130	8	23	922
Ghana	5	76	87	7	29	1,130
Togo	6	84	163	8	29	963
São Tomé and Príncipe	7	88	176	8	29	577
Seychelles	8	90	104	5	19	1,839
Tanzania	9	103	127	7	31	1,475
Madagascar	10	109	144	9	27	1,660
Guinea	11	110	171	9	32	1,191
Guinea-Bissau	12	111	179	6	24	2,349
Liberia	13	115	157	9	17	1,212
Gabon	14	128	151	8	22	1,955
Benin	15	129	169	7	40	1,393
Comoros	16	129	155	10	21	1,057
Sierra Leone	17	132	156	7	34	1,535
Equatorial Guinea	18	133	167	7	49	1,411
Cameroon	19	137	164	8	33	1,672
Sudan	20	139	147	6	49	2,900
Mozambique	21	140	141	10	32	1,475
Lesotho	22	141	123	8	49	1,715
Nigeria	23	144	118	9	42	1,306
Uganda	24	145	111	7	37	3,290
South Africa	25	147	32	9	35	1,721
Kenya	26	148	82	8	26	2,190
Botswana	27	149	38	9	42	3,064
Namibia	28	150	51	9	24	1,813
Ethiopia	29	152	116	8	42	2,893
Zambia	30	153	100	9	64	3,335
Swaziland	31	154	108	11	33	2,249
Côte d'Ivoire	32	155	161	9	43	2,437
Mauritania	33	158	160	11	42	1,523
Chad	34	159	175	9	102	6,020
Dem. Rep. of the Congo	35	160	181	9	66	2,483
Zimbabwe	36	162	158	9	73	3,999
Eritrea	37	163	173	13	60	1,581
Mali	38	166	166	11	42	2,902
Malawi	39	167	134	10	54	2,550
Rwanda	40	168	139	10	42	5,070
Niger	41	169	172	10	64	3,545
Burundi	42	170	177	10	71	3,705
Angola	43	172	168	9	62	3,325
Burkina Faso	44	173	148	11	54	3,630

TABLE E.1 World Bank Doing Business indicators: Trading Across Borders (imports) in sub-Saharan Africa, 2009—Continued

Economy	Rank		Trading Across Border			
	In SSA	Overall trading across borders ^a	Overall ease of doing business ^a	Documents for import (number) ^b	Time for import (days) ^c	Cost to import (US \$ per container) ^d
Central African Republic	45	175	180	18	66	5,074
Rep. of the Congo	46	176	178	12	62	2,959
SSA average				9	41	2,279
Regional averages						
East Asia & Pacific				7	25	949
Eastern Europe & Central Asia				8	32	1,822
Latin America & Caribbean				7	22	1,384
Middle East & North Africa				8	27	1,205
OECD				5	11	1,133
South Asia				9	33	1,487
SSA				9	41	2,279

Source: World Bank, Doing Business Online Database. <http://www.doingbusiness.org> (accessed January 12, 2009).

^aOut of 181 economies.

^bIncludes bank documents, customs clearance documents, port and terminal handling documents, and transport documents.

^cIncludes the time for obtaining all documents, inland transport, customs clearance and inspections, and port and terminal handling. Does not include ocean transport time.

^dIncludes the cost of obtaining all documents, inland transport, customs clearance and inspection, and port and terminal handling. Includes official costs only.

TABLE E.2 World Bank Doing Business indicators: Trading Across Borders (exports) in sub-Saharan Africa, 2009

Economy	Rank		Trading Across Borders			
	In SSA	Overall trading across borders ^a	Overall ease of doing business ^a	Documents for export (number) ^b	Time for export (days) ^c	Cost to export (US \$ per container) ^d
Mauritius	1	20	24	5	17	725
Cape Verde	2	56	143	5	19	1,325
Senegal	3	60	149	6	14	1,078
The Gambia	4	73	130	6	24	831
Ghana	5	76	87	6	19	1,003
Togo	6	84	163	6	24	940
São Tomé and Príncipe	7	88	176	8	27	690
Seychelles	8	90	104	6	17	1,839
Tanzania	9	103	127	5	24	1,262
Madagascar	10	109	144	4	23	1,279
Guinea	11	110	171	7	33	720
Guinea-Bissau	12	111	179	6	25	1,545
Liberia	13	115	157	10	20	1,232
Gabon	14	128	151	7	20	1,945
Benin	15	129	169	7	32	1,237
Comoros	16	129	155	10	30	1,073
Sierra Leone	17	132	156	7	29	1,450
Equatorial Guinea	18	133	167	7	30	1,411
Cameroon	19	137	164	9	27	995
Sudan	20	139	147	6	35	2,050
Mozambique	21	140	141	8	26	1,200
Lesotho	22	141	123	6	44	1,549
Nigeria	23	144	118	10	25	1,179
Uganda	24	145	111	6	39	3,090
South Africa	25	147	32	8	30	1,445
Kenya	26	148	82	9	29	2,055
Botswana	27	149	38	6	31	2,508
Namibia	28	150	51	11	29	1,686
Ethiopia	29	152	116	8	46	2,087
Zambia	30	153	100	6	53	2,664
Swaziland	31	154	108	9	21	2,184
Côte d'Ivoire	32	155	161	10	23	1,904
Mauritania	33	158	160	11	35	1,520
Chad	34	159	175	6	78	5,367
Dem. Rep. of the Congo	35	160	181	8	46	2,607
Zimbabwe	36	162	158	7	53	2,678
Eritrea	37	163	173	9	50	1,431
Mali	38	166	166	9	38	2,012
Malawi	39	167	134	12	45	1,671
Rwanda	40	168	139	9	42	3,275
Niger	41	169	172	8	59	3,545
Burundi	42	170	177	9	47	2,147
Angola	43	172	168	12	68	2,250
Burkina Faso	44	173	148	11	45	2,132

TABLE E.2 World Bank Doing Business indicators: Trading Across Borders (exports) in sub-Saharan Africa, 2009—*Continued*

Economy	Rank		Trading Across Borders			
	In SSA	Overall trading across borders ^a	Overall ease of doing business ^a	Documents for export (number) ^b	Time for export (days) ^c	Cost to export (US \$ per container) ^d
Central African Republic	45	175	180	8	57	5,121
Rep. of the Congo.	46	176	178	11	50	2,490
SSA Average				8	35	1,879
Regional averages:						
East Asia & Pacific				7	23	902
Eastern Europe & Central Asia				7	30	1,649
Latin America & Caribbean				7	20	1,230
Middle East & North Africa				7	23	1,024
OECD				5	11	1,069
South Asia				9	33	1,339
SSA				8	35	1,879

Source: World Bank, Doing Business Online Database. <http://www.doingbusiness.org> (accessed January 12, 2009).

^aOut of 181 economies.

^bIncludes bank documents, customs clearance documents, port and terminal handling documents, and transport documents.

^cIncludes the time for obtaining all documents, inland transport, customs clearance and inspections, and port and terminal handling. Does not include ocean transport time.

^dIncludes the cost of obtaining all documents, inland transport, customs clearance and inspection, and port and terminal handling. Includes official costs only.

APPENDIX F

Logistics Performance Index and Select Indicators: Sub-Saharan Africa

The Logistics Performance Index (LPI) provides a cross-country assessment of logistics performance. LPI scores, based on a scale of 1 to 5 (lowest to highest performance), are aggregated from more than 5,000 country evaluations and surveys by professionals engaged in international trade within 150 countries. Logistics performance is evaluated in seven domains: (1) efficiency of the clearance process by customs and other border agencies; (2) quality of transport and information technology infrastructure for logistics; (3) ease and affordability of arranging international shipments; (4) competence of the local logistics industry; (5) ability to track and trace international shipments; (6) domestic logistics costs; and (7) timeliness of shipments in reaching destination.¹

¹ For more information on the Logistics Performance Index, see Jean-Francois Arvis, et al., *Connecting to Compete: Trade Logistics in the Global Economy*, World Bank, 2007.

TABLE F.1 Logistics Performance Index: SSA and regional comparisons, 2007

LPI ranking			Indicator							
SSA	Int'l	Country	LPI score	Customs	Infrastructure	Int'l shipments	Logistics competence	Tracking and tracing	Domestic logistics costs	Timeliness
1	24	South Africa	3.53	3.22	3.42	3.56	3.54	3.71	2.61	3.78
2	57	São Tomé and Príncipe	2.86	2.50	2.20	3.40	3.00	3.00	3.67	3.00
3	62	Guinea	2.71	2.50	2.33	2.50	2.67	2.83	3.20	3.50
4	64	Sudan	2.71	2.36	2.36	2.67	2.83	2.92	3.00	3.17
5	67	Mauritania	2.63	2.40	2.20	2.60	2.70	2.80	3.11	3.10
6	76	Kenya	2.52	2.33	2.15	2.79	2.31	2.62	2.75	2.92
7	77	The Gambia	2.52	2.25	2.33	2.67	3.00	2.33	3.00	2.50
8	83	Uganda	2.49	2.21	2.17	2.42	2.55	2.33	3.63	3.29
9	84	Cameroon	2.49	2.57	2.00	2.33	2.25	2.50	3.00	3.29
10	85	Comoros	2.48	2.30	2.46	2.33	2.64	2.50	3.00	2.67
11	86	Angola	2.48	2.40	2.25	2.50	2.50	2.38	3.00	2.83
12	89	Benin	2.45	1.80	1.89	2.78	2.56	2.89	3.22	2.78
13	91	Malawi	2.42	2.25	2.13	2.56	2.56	2.00	3.13	3.00
14	93	Nigeria	2.40	2.23	2.23	2.49	2.38	2.36	2.90	2.69
15	100	Zambia	2.37	2.08	2.00	2.40	2.44	2.80	3.10	2.50
16	101	Senegal	2.37	2.38	2.09	2.09	2.73	2.30	3.09	2.63
17	102	Côte d'Ivoire	2.36	2.22	2.22	2.13	2.38	2.00	3.00	3.25
18	104	Ethiopia	2.33	2.14	1.88	2.43	2.00	1.83	3.17	3.67
19	105	Liberia	2.31	2.40	2.14	2.83	2.00	2.00	3.20	2.43
20	108	Lesotho	2.30	2.40	2.00	2.50	2.20	1.83	3.50	2.83
21	109	Mali	2.29	2.17	1.90	2.23	2.21	2.38	3.05	2.88
22	110	Mozambique	2.29	2.23	2.08	2.25	2.36	2.00	2.83	2.83
23	113	Burundi	2.29	2.20	2.50	2.50	2.50	2.00	2.33	2.00
24	114	Zimbabwe	2.29	1.92	1.87	2.27	2.21	2.64	2.36	2.85
25	116	Guinea-Bissau	2.28	2.14	2.25	2.22	2.00	2.22	3.14	2.86
26	119	Togo	2.25	2.10	2.25	2.40	2.40	2.20	3.33	2.11
27	120	Madagascar	2.24	2.24	2.13	2.25	2.00	2.19	3.21	2.67
28	121	Burkina Faso	2.24	2.13	1.89	2.67	2.33	2.13	2.67	2.25
29	124	Eritrea	2.19	2.14	2.00	2.00	2.67	2.50	3.00	1.83
30	125	Ghana	2.16	2.00	2.25	2.25	1.75	2.25	2.00	2.50
31	126	Namibia	2.16	2.14	2.00	2.14	1.83	1.83	2.60	3.00
32	127	Somalia	2.16	2.43	1.63	1.88	2.25	1.75	3.00	3.00
33	132	Mauritius	2.13	2.00	2.29	2.20	1.75	2.25	2.67	2.33
34	134	Gabon	2.10	2.25	2.40	1.67	2.00	2.00	2.75	2.33
35	137	Tanzania	2.08	2.07	2.00	2.08	1.92	2.17	3.33	2.27

TABLE F.1 Logistics Performance Index: SSA and regional comparisons, 2007—*Continued*

LPI ranking			Indicator							
SSA	Int'l	Country	LPI score	Customs	Infrastructure	Int'l shipments	Logistics competence	Tracking and tracing	Domestic logistics costs	Timeliness
36	142	Chad	1.98	2.00	1.80	1.83	1.82	1.91	4.00	2.56
37	143	Niger	1.97	1.67	1.40	1.80	2.00	2.00	1.67	3.00
38	144	Sierra Leone	1.95	1.58	1.83	1.82	1.91	2.00	3.00	2.64
39	148	Rwanda	1.77	1.80	1.53	1.67	1.67	1.60	3.07	2.38
		SSA average	2.35	2.21	2.11	2.36	2.33	2.31	2.98	2.77
		Region								
	1	Europe & Central Asia	2.59	2.39	2.39	2.61	2.53	2.55	2.97	3.04
	2	East Asia & Pacific	2.58	2.41	2.37	2.64	2.54	2.53	3.04	3.01
	3	Latin America & Caribbean	2.57	2.38	2.38	2.55	2.52	2.58	2.97	3.02
	4	Middle East & North Africa	2.42	2.24	2.27	2.44	2.33	2.35	2.95	2.88
	5	SSA Average	2.35	2.21	2.11	2.36	2.33	2.31	2.98	2.77
	6	South Asia	2.30	2.06	2.07	2.28	2.32	2.32	3.12	2.73
		Income groups^a								
	1	High income	3.67	3.45	3.66	3.52	3.64	3.71	2.58	4.05
	2	Upper middle income	2.85	2.64	2.70	2.84	2.80	2.83	2.94	3.31
	3	Lower middle income	2.47	2.31	2.27	2.48	2.40	2.45	3.01	2.93
	4	Low income	2.29	2.12	2.06	2.32	2.29	2.25	2.99	2.71

Source: Logistics Performance Index Online Database. <http://www.worldbank.org> (accessed January 12, 2009).

^aIncome groups are based on 2005 gross national income per capita, and calculated using the World Bank Atlas method. Income groups include the following: low income (\$875 or less), lower middle income (\$876–3,465), upper middle income (\$3,466–10,725), and high income (\$10,726 or more).

APPENDIX G

Harmonized System Categories

TABLE G.1 Harmonized System (HS) categories by select SSA industry sector

Industry sector	HS chapters, headings, or subheadings included	Description
Coffee	0901	Coffee, whether or not roasted or decaffeinated; coffee husks and skins; coffee substitutes containing coffee in any proportion
Tropical fruit	0803 0804.30	Bananas and plantains, fresh or dried Pineapples
Shea butter	Shea nuts and shea butter fall under HTS subheadings 1207.99.02 and 1515.90.21, both of which include other types of nuts and oils/fats not elsewhere specified or included. The HTS at the legal rate line (8-digit) level does not include statistical reporting provisions that pertain solely to shea nuts or shea butter.	
Natural rubber	4001	Natural rubber, balata, gutta-percha, guayule, chicle and similar natural gums, in primary forms or in plates, sheets, or strip
Textiles and apparel	For this study, the Commission includes in the definition of textiles the following headings and chapters: 5004, 5005, 5006, 5007, 5105, 5106, 5107, 5108, 5109, 5110, 5111, 5112, 5113, 5203, 5204, 5205, 5206, 5207, 5208, 5209, 5210, 5211, 5212, 5306, 5307, 5308, 5309, 5310, 5311, 5407, 5408, 5507, 5508, 5509, 5510, 5511, 5512, 5513, 5514, 5515, 5516, 56, 57, 58, 59, 60, and 63. Apparel includes chapters 61 and 62.	
Leather	4104	Tanned or crust hides and skins of bovine (including buffalo) or equine animals, without hair on, whether or not split, but not further prepared
	4105	Tanned or crust skins of sheep or lambs, without wool on, whether or not split, but not further prepared
	4106	Tanned or crust skins of other animals, without wool or hair on, whether or not split, but not further prepared
	4107	Leather further prepared after tanning or crusting, including parchment-dressed leather, of bovine (including buffalo) or equine animals, without hair on, whether or not split, other than heading 4114
	4112	Leather further prepared after tanning or crusting, including parchment-dressed leather, of sheep or lamb, without wool on, whether or not split, other than leather of heading 4114
	4113	Leather further prepared after tanning or crusting, including parchment-dressed leather, of other animals, without wool or hair on, whether or not split, other than leather of heading 4114
	4114	Chamois (including combination chamois) leather; patent leather and patent laminated leather; metallized leather
	4115	Composition leather with a basis of leather or leather fiber, in slabs, sheets or strip, whether or not in rolls; parings and other waste of leather or of composition leather, not suitable for the manufacture of leather articles; leather dust, powder and flour

Source: Compiled by Commission staff from U.S. International Trade Commission, *Harmonized Tariff Schedule of the United States* (HTSUS) (2007). Use of the 2007 HTSUS corresponds with the last year of trade data used in the study.