Food and Agriculture Organization of the United Nations

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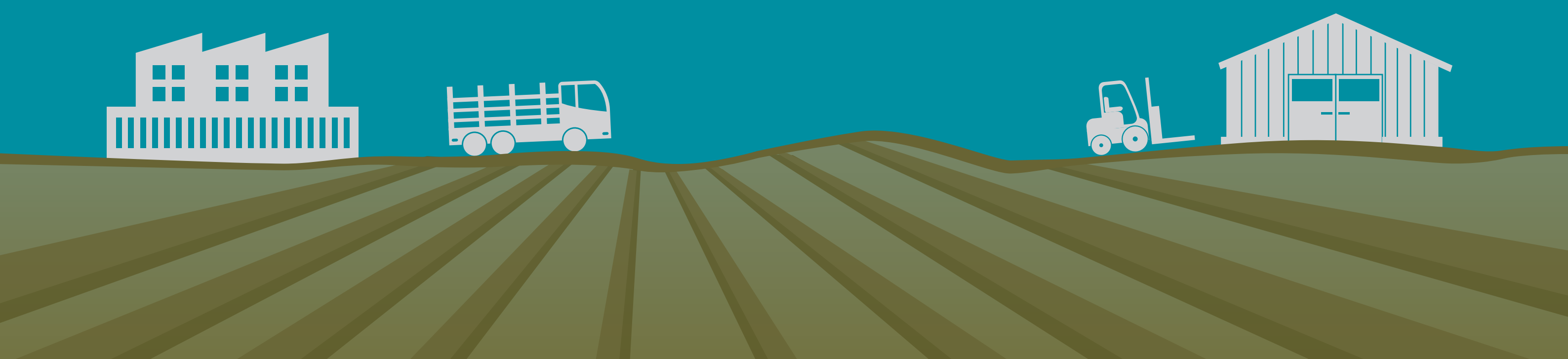
Report based on appraisals in Cameroon, Ghana, Uganda and the United Republic of Tanzania



Firm-level logistics systems for the agrifood sector in sub-Saharan Africa

Report based on appraisals in Cameroon, Ghana, Uganda and the United Republic of Tanzania

by
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Executive summary

In developing countries, development of the agrifood industry sector is essential for economic growth. In sub-Saharan Africa, the agriculture sector accounts for averages of about 20 percent of gross domestic product (GDP) and 60 percent of the labour force. However, both manufacturing and logistics costs limit the competitiveness of the agrifood sector. Recognizing that effective and efficient logistics systems play a particularly important role in reducing costs in supply and marketing chains, FAO commissioned studies in four sub-Saharan African countries – Cameroon, Ghana, Uganda and the United Republic of Tanzania – to appraise the current state of logistics systems and management in the agrifood sector and to explore opportunities for and challenges to the design of appropriate interventions. A total of 93 firms were investigated: 26 in Cameroon, 20 in Ghana, 27 in Uganda and 20 in the United Republic of Tanzania. Of these firms, 76 operated in agrifood sectors; the remaining 17 firms were studied to learn about their best practices in logistics, which could be useful in agrifood logistics operations. Of the agrifood firms, 25 percent were small, 45 percent were medium-sized and 30 percent were large. This report presents a synthesis of the main findings from the four appraisal reports.

The appraisals showed that existing policy environments promote the agrifood sector and address logistics issues mainly for small and medium-sized agrifood industry firms. National policies focus on reducing poverty, improving infrastructure and developing institutional capacity for policy implementation, with the overall aim of achieving middle-income country status. Some of these policies have been implemented successfully while others have failed, indicating the existence of barriers to implementation, such as inconsistent policies, bureaucracy, corruption and limited political willingness.

Findings indicate that perceptions of logistics management differ according to the size of the agrifood firm; personnel responsible for logistics activities lack understanding of logistics systems and management; and overall logistics performance and perceptions of logistics are best in large agrifood firms, good in medium-sized firms, and poor in small firms in all four countries. The studies also found that the efficiency of agrifood firms' logistics is influenced by both external factors (policy issues, infrastructure, technology, markets and the environment) and internal factors (site of the firm, warehouse and storage systems, and presence of cooling facilities, skilled human resources, equipment, machinery and vehicles, and information and communications technology [ICT]). The influence of these factors also depends on the size of the firm.

In general, logistics efficiency was low across the four countries because of inadequate implementation of policies and quality standards, poor infrastructure and financial constraints, which increased logistics costs while reducing efficiency. Logistics systems and management were better in large-scale agrifood firms than in smaller ones.

The logistics challenges facing agrifood industries in the four countries include inadequate or inefficient infrastructure (external factors), lack of effective logistics systems and management (internal factors) or both. The major infrastructure-related problems included: i) lack of financial institutions; ii) inconsistencies in policy; iii) unfair competition and other marketing problems; iv) unfair tax burdens and non-tariff barriers; v) heavy traffic and cargo delays at ports; vi) inadequate road networks; vii) high and fluctuating fuel costs; viii) high costs and irregular supplies of electricity and water; and ix) poor or lacking communication networks. The main internal logistics challenges for agrifood firms included: i) shortages and seasonal variability of raw materials; ii) high costs of packaging and labelling materials; iii) high costs of hiring and training personnel for logistics management; iv) inadequate and inappropriate warehousing and storage systems; v) outdated/inefficient processing equipment, quality control equipment, machinery and vehicles; vi) high maintenance costs; vii) poor access to ICT systems and market information; viii) long-distance deliveries; and ix) lack of effective waste disposal systems, especially for small-scale firms.

Important opportunities for developing the agrifood sector include: i) high prices and demand for quality goods on domestic and international markets; ii) good export opportunities, particularly for the three countries that are not landlocked, as maritime transport is increasing; iii) availability of processing technologies and experience; iv) supportive government policies; v) availability of labour; vi) possibilities for outsourcing some logistics services; vii) availability of institutions for quality assurance and safety management; viii) possibilities for increasing local production of raw materials; ix) improved infrastructure such as road and communication networks; and x) availability of relatively good expertise and facilities for logistics at large firms.

The best logistics practices of non-agrifood firms that could be adapted by agrifood firms include establishing good relationships with customers; motivating employees and providing training for logistics officers and drivers; improving packaging materials; addressing the issues that hinder companies from making economically viable and cost-effective investments in equipment and maintenance services; improving route planning; outsourcing some logistics activities; and using modern means of communication and ICT systems. These investments should be based on financial feasibility studies.

Important lessons learned from the appraisal studies include: i) the importance of effective implementation of policies; ii) the poor logistics performance and perceptions across agrifood firms; iii) the huge impact of infrastructure on logistics performance; iv) the importance of outsourcing to solve logistics problems; v) the value of effective information flows; vi) the need for reliable suppliers of raw materials, and the selection of appropriate sites for firms; vii) the importance of good plant design; viii) the need to train managers and staff; and ix) the importance of effective logistics systems for perishable produce. To improve the logistics and overall performance of agrifood firms, attention needs to be given to critical areas such as: i) policy implementation; ii) infrastructure and facility improvement; iii) networking and linking of agrifood firms in vertical and horizontal chains; iv) training services; v) improving information connectivity; and vi) improving access to financial sources.

It is recommended that more studies be carried out on agrifood logistics, covering wider regions, failed firms, animal transport and abattoir activities. To tackle logistics challenges in the agrifood industry sector, recommendations are given for both the government and firm levels. Recommendations for governments include: i) encouraging knowledge-based policy planning and ensuring political willingness and good governance for effective implementation; ii) encouraging construction and maintenance of infrastructure such as roads and investing in alternative power supply schemes such as solar and wind energy; and iii) creating a regional centre of excellence in logistics to serve as a knowledge bank for education and training programmes on logistics systems and management in the agrifood sector. The centre should provide technical capacity for designing logistics systems and management that support effective implementation of logistics-related policies. The centre could be established through existing regional bodies such as the East African Community (EAC) and the Economic Community of West African States (ECOWAS).

Recommendations for agrifood firms include: i) outsourcing logistics services to third-party providers; ii) improving transport services by investing in vehicles and maintenance services, timing deliveries appropriately and synchronizing inflows of raw materials with outflows of finished goods; iii) improving facilities through investments in standby generators, water reservoirs, storage systems, cold chain facilities and the establishment of cold storage near production sites; iv) strengthening linkages among agrifood firms, research institutions, financial institutions and local farmers; v) investing in advanced ICT systems (especially at large firms), and enhancing firms' capacity to use ICT systems to support logistics (especially at small and medium-sized firms); vi) enhancing competitiveness by improving product quality and safety, market information, relationships with business partners and customers, product delivery and traceability, and logistics costs; and vii) conducting tailor-made training, for supply agents on pre-processing raw materials, for local farmers on improving the quality of raw materials, and for ICT users, technicians and drivers.

Financial institutions, including banks, are encouraged to facilitate enhanced investments in logistics activities in agrifood firms by providing loans, grants and other budgetary support.

Abstract

Recognizing that effective and efficient logistics systems play an important role in reducing costs in supply and marketing chains, FAO commissioned studies in Cameroon, Ghana, Uganda and the United Republic of Tanzania to appraise the state of logistics in the agrifood sector. The studies found that logistics efficiency in agrifood firms is influenced by both external and internal factors and depends on the size of the firms. The recommendations for governments include policy and infrastructure development. Furthermore, firms should improve transport facilities, enhance the use of ICT, outsource some of the services and support staff training on logistics.

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Acronyms

AfDB	African Development Bank
AGS	Rural Infrastructure and Agro-Industries Division (FAO)
CEMAC	Central African Economic and Monetary Community
CSCMP	Council of Supply Chain Management Professionals
EAC	East African Community
ECOWAS	Economic Community of West African States
GDP	gross domestic product
GMP	good manufacturing practice
GPS	Global Positioning System
HACCP	Hazard Analysis and Critical Control Point (system)
ICT	information and communications technology
IT	information technology
LPI	Logistics Performance Index
SWOT	strengths, weaknesses, opportunities and threats (analysis)
TKM	tonnes per kilometre
USAID	United States Agency for International Development

Chapter 1
Introduction

1.1 BACKGROUND AND RATIONALE

This report provides a synthesis of the results of four country studies appraising logistics systems and management practices in the agrifood sector in Cameroon, Ghana, Uganda and the United Republic of Tanzania. The studies focused on existing practices and opportunities for small and medium-sized agricultural enterprises to enhance their logistics systems and management, and identified the challenges to efficient logistics. Experiences were also gathered from large agrifood enterprises and selected non-agrifood enterprises that are involved in logistics operations in the four countries. The studies provided information for the design of interventions aimed at enhancing logistics management in small and medium-sized agrifood enterprises, especially in developing countries. This information will help FAO to develop practical guidance on improving logistics systems and management.

Figure 1 shows the geographical locations of the four countries studied: Ghana and Cameroon are in West Africa; and Uganda and the United Republic of Tanzania in East Africa. Three of the countries are not landlocked, and all have opportunities for expanding export and import facilities and economic activities.

Of the four countries, Ghana has the largest economy, with gross domestic product (GDP) of more

FIGURE 1
Locations of the four countries investigated

Source: author's elaboration (based on UN map No. 4045 Rev. 7, November 2011. Department of Field Support, Cartographic Section).

than US$39 billion and the fastest annual growth of GDP, at more than 14 percent in 2011. Uganda has the smallest GDP, at US$16.8 billion, and Cameroon the lowest annual GDP growth at 3.8 percent in 2011. Ghana and Cameroon have small populations and are in the low-middle-income category. Uganda and the United Republic of Tanzania have larger populations and are categorized as low-income countries (Table 1).

The studies investigated micro, small, medium-sized and large firms in the agrifood and related industries. Overall, about 82 percent of the firms were operating in the agrifood sector and 18 percent in other sectors. These non-agrifood firms were included to investigate whether they could provide useful lessons for adoption in the agrifood sector.

1.2 LOGISTICS SYSTEMS AND LOGISTICS MANAGEMENT

Actors in the agrifood supply chain should understand the logistics of handling raw materials and final products, and know how to develop and manage an appropriate logistics system. Logistics is not the same as supply chain management, and includes more than transport and associated activities. The widely accepted definition of logistics management provided by the Council of Supply Chain Management Professionals (CSCMP) states that "*Logistics management is part of supply chain management that plans, implements, and controls the efficient, effective forward and reverses flow and storage of goods, services and related information between the point of origin and the point of consumption in order to meet customers' requirements*" (CSCMP, no date) (Figure 2).

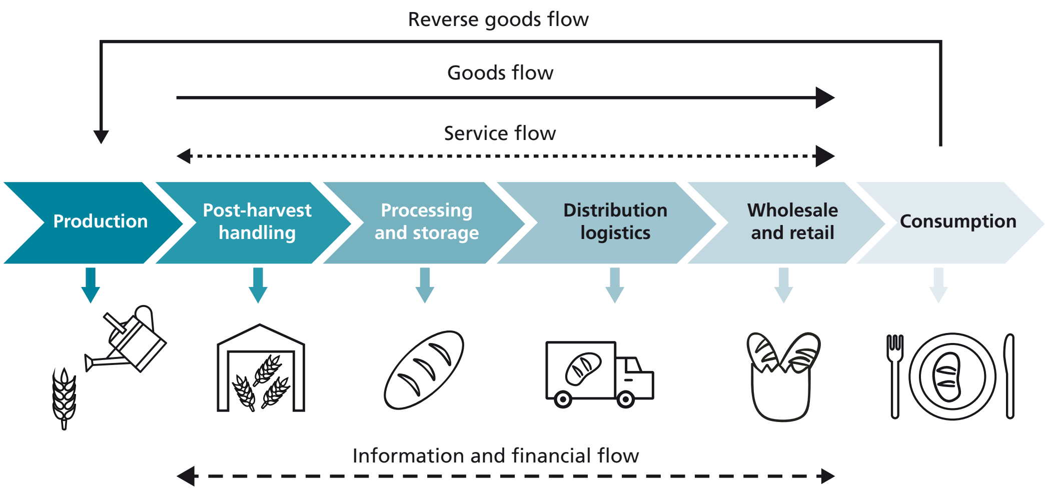
CSCMP defines supply chain management as "*the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities*". Supply chain management aims to coordinate and integrate activities within and among firms and their processes, such as product design, financing arrangements, information technology and marketing services.

TABLE 1
Macroeconomic indicators and information on the four countries

Description	Cameroon	Ghana	Uganda	United Republic of Tanzania
Total area (km^2)	475 400	238 500	241 600	947 300
Population in 2011 (millions)	20	25	34.5	46.2
GDP in 2011 (US$ billion)	24.1	35.1	17.5	24.2
Agriculture value added as % of GDP	24	25	25	28
Income level	Lower-middle	Lower-middle	Low	Low

Source: World Bank, 2013.

FIGURE 2
Flows of materials, information and financing along the value chain



Source: authors' elaboration.

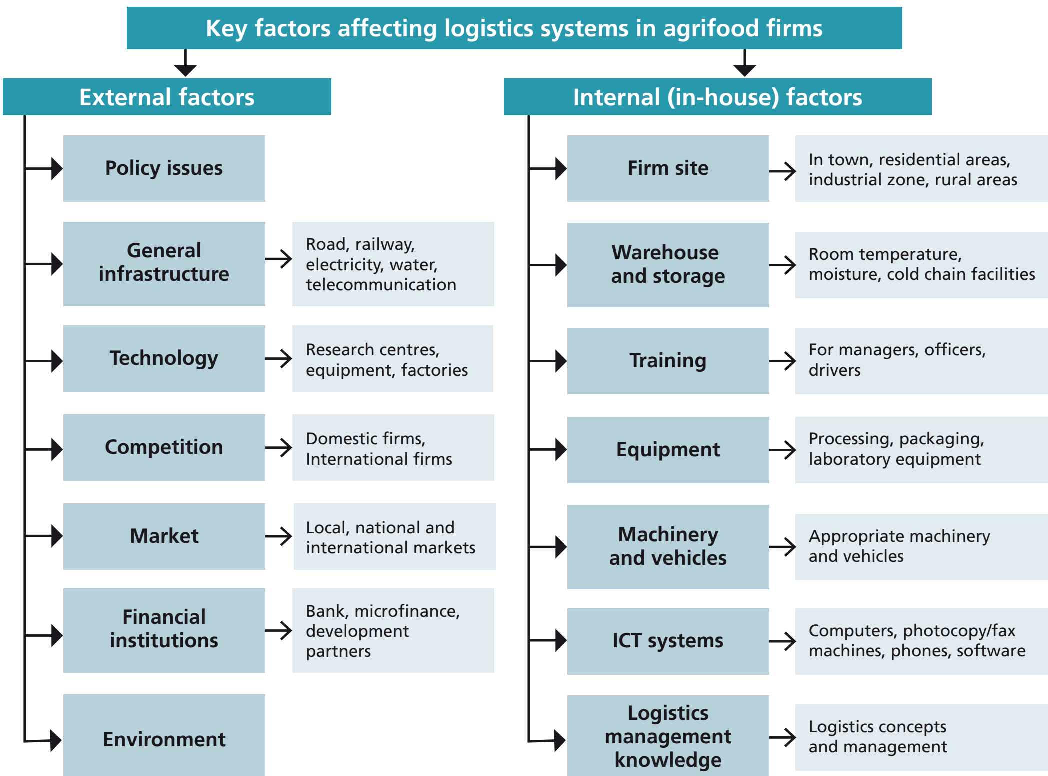
Logistics management is concerned with the flow of materials and associated information, services and financing (Figure 2). Its activities typically include design of a logistics network, management of inbound and outbound transport, warehousing, procurement and inventory management. The studies in the four countries found that perceptions of what logistics means varied depending on the size of the firm and that the personnel responsible for logistics activities generally lacked an adequate understanding of logistics systems and management as an integral part of their companies' operations.

Major logistics activities at the firm level include customer services, forecasting and planning of demand, inventory management, communications, handling of materials, processing of orders, packaging, supply of parts and support services, selection of plant and warehouse sites, procurement, handling of returned goods (reverse logistics), transportation, warehousing and storage, and logistics technologies.

Logistics systems in the agrifood sector should address the flow of agrifood products throughout the supply chain. A typical logistics system for an agrifood firm includes: i) selecting the firm's location; ii) developing processing facilities; iii) acquiring cold chain facilities; iv) sourcing and transporting raw materials; v) moving finished products during processing; vi) managing packaging and labelling facilities; vii) managing warehouse and storage facilities; viii) controlling inventories; ix) managing procurement and customer orders; x) controlling product quality and safety; xi) managing transport fleets for product delivery; xii) acquiring and implementing information and communication technology (ICT) systems; xiii) controlling financial and information flows; and xiv) ensuring product traceability.

Both external and internal factors affect the logistics performance of agrifood and other industrial firms. The main external factors include policy issues, infrastructure, technology, markets and the environment. The main internal factors include the firm's location; warehouse and storage systems, including cooling facilities; and the availability of skilled personnel, equipment, machinery, vehicles and ICT systems (Figure 3). A weakness

FIGURE 3
Major factors affecting the logistics performance of the agrifood firms studied



Source: authors' elaboration.

in any of these external or internal factors leads to ineffective logistics activities and poor overall performance of the firm.

Sub-Saharan Africa relies on the agriculture sector, which accounts for averages of approximately 20 percent of GDP and 60 percent of the labour force (Beintema and Stads, 2004). As well as its labour force, the region's good reserves of exploitable natural resources provide opportunities for increasing agrifood-based economic growth. Effective logistics systems are essential for growth of the agrifood sector. Poor logistics infrastructure and management reduce product quality, safety and access to markets, while increasing logistics costs. Governments and agrifood companies should therefore establish strategies for continuously improving logistics infrastructure and implementation, taking short- and long-term development objectives into consideration (Ittmann, 2007).

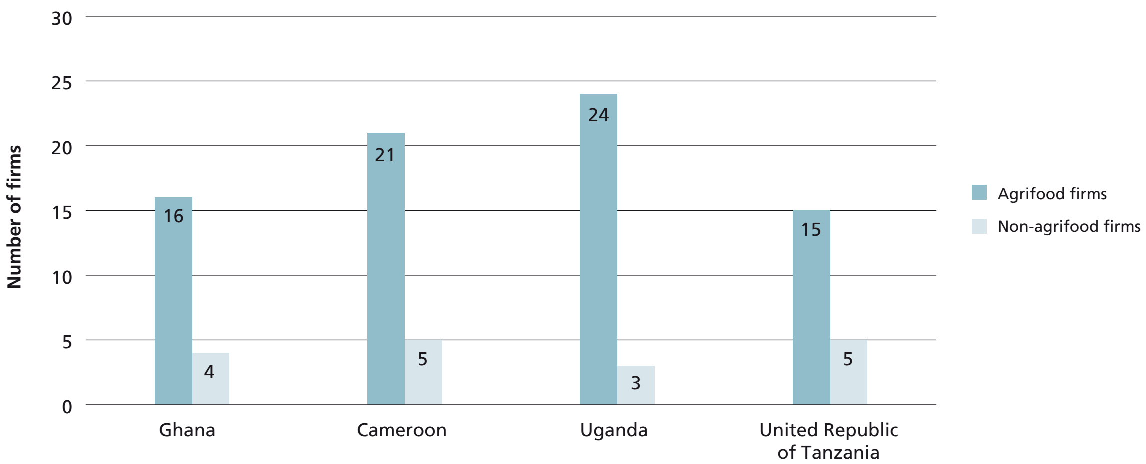
1.3 SCOPE, OBJECTIVES AND METHODOLOGY OF THE STUDY

This synthesis report provides a summary of appraisal studies from Cameroon, Ghana, Uganda and the United Republic of Tanzania. It compares and elaborates findings from the four reports, focusing on the policy issues, challenges and opportunities facing logistics systems and affecting the management of agrifood firms. It also identifies important lessons learned from the studies and provides recommendations on how to improve the logistics performance of agrifood firms and enhance the growth of the sector as whole.

The appraisal studies were conducted by national consultants applying a similar approach in all four countries. The methodology involved collecting data through structured and non-structured questionnaires, interviews and group discussions. Secondary data were collected from policy documents and reports from government and other offices and relevant Internet sites. Micro, small, medium-sized and large firms operating in agrifood and non-agrifood industries were identified and investigated. Product coverage and the firms' willingness to participate in the study were the main selection criteria. Data collection tools were pre-tested, data were validated, and on-the-spot cross-checking and further discussions with key informants were carried out to ensure that the data collected reflected the actual situation on the ground. A total of 93 firms were investigated: 26 in Cameroon, 20 in Ghana, 27 in Uganda and 20 in the United Republic of Tanzania. Fewer agrifood firms were visited in the United Republic of Tanzania (15) and Ghana (16) than in Cameroon (21) and Uganda (24) (Figure 4).

Of 93 firms investigated, 76 (82 percent) were operating in the agrifood sector; of these agrifood firms, about 25 percent were small, 45 percent were medium-sized, and 30 percent were large (Figure 4 and Table 2). The firms were categorized by size according to the system used in the country concerned, as shown in Table 2. In general, micro firms have up to five employees, small firms up to 50 employees, medium-sized firms up to 100 employees, and large firms more than 100 employees.

FIGURE 4
Distribution of the firms investigated in the four countries



Source: authors' elaboration.

TABLE 2
Government systems for categorizing firms by size in the study countries

Category	Country	Criteria applied and information from investigated firms
Micro	Cameroon	Up to 5 employees; up to US$10 000 in fixed assets
	Ghana	NA
	Uganda	1–4 employees; up to US$5 000 of capital investment in machinery
	United Republic of Tanzania	Up to 4 employees; up to US$4 800 in total assets
Small	Cameroon	6–29 employees; up to US$100 000 in fixed assets
	Ghana	4–14 employees
	Uganda	5–50 employees; US$4 800–144 000 in total assets
	United Republic of Tanzania	5–49 employees; US$50 000–200 000 of capital investment in machinery
Medium-sized	Cameroon	51–100 employees; US$144 000–12 million in total assets
	Ghana	22–96 employees
	Uganda	30–99 employees; up to US$1 million in fixed assets
	United Republic of Tanzania	50–99 employees; US$200 000–800 000 of capital investment in machinery
Large	Cameroon	More than 100 employees; more than US$12 million in total assets
	Ghana	118–6 000 employees
	Uganda	More than 99 employees; more than US$1 million in fixed assets
	United Republic of Tanzania	At least 100 employees; more than US$800 000 of capital investment in machinery

Regarding the commodities handled, 31 percent of the agrifood industry firms investigated in the four countries dealt with cereals and oilseeds; about 26 percent dealt with fresh or processed fruits and vegetables; 14 percent processed meat, fish and seafood; 8 percent processed dairy products; 10 percent provided drink and food services; 4 percent processed tea and coffee; and the remaining 7 percent processed other products such as honey or confectionery (Figure 5). More than 53 percent of the firms dealt with perishable products ranging from fresh fruits and vegetables to food services. Many of the firms investigated in Uganda processed cereals, oilseeds, fresh fruits and vegetables. In Ghana, agrifood firms dealt with meat, fish and seafood, fruits and vegetables, cereal or oilseeds. In Cameroon, firms dealt with cereals, oilseeds, fruits and vegetables, meat, fish and seafood. Most of the firms investigated in the United Republic of Tanzania processed cereals, oilseeds or drinks.

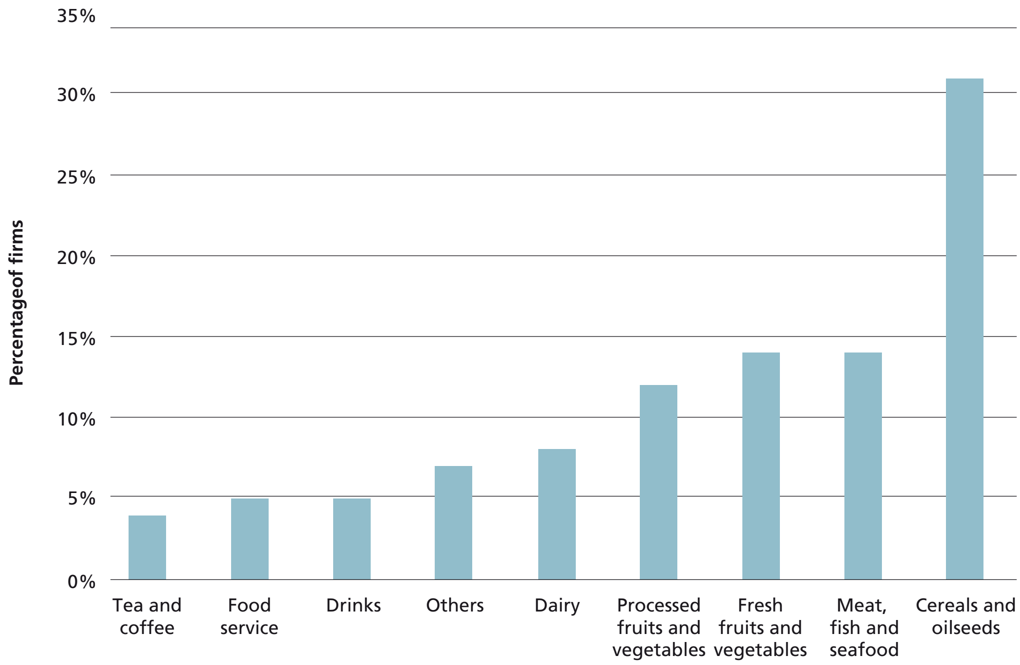
The objective of this report is to analyse the main findings from the four appraisal reports and outline an overall picture of the logistics systems and management of agrifood firms in the countries studied. The main findings were analysed, and analysis results are presented and discussed, focusing on: i) policies, strategies and other efforts for enhancing the logistics systems of agrifood firms; ii) the state of infrastructure; iii) knowledge, attitudes and practices of managers and other stakeholders in the agrifood industry regarding logistics management; iv) actions taken to improve logistics systems; v) the efficiency of logistics systems in relation to the overall efficiency of firms' operations; and vi) general and specific needs for enhancing logistics management in agrifood firms.

1.4 ORGANIZATION OF THE REPORT

Findings are presented in six chapters:

- *Chapter 1* provides an introduction to the report and covers the background and rationale for logistics. The concepts of logistics systems and management in agrifood industries are discussed and the scope, objectives and methodology used in the appraisal studies in Cameroon, Ghana, Uganda and the United Republic of Tanzania are outlined. In conclusion, the chapter describes how the rest of the report is organized.
- *Chapter 2* provides background information on the countries studied and discusses macroeconomic management and the main factors affecting logistics performance. The chapter also reviews the Logistics Performance Index (LPI), which is a benchmarking tool developed by the World Bank to identify the challenges and opportunities that countries face in carrying out trade logistics.
- *Chapter 3* presents findings from the appraisal studies of logistics systems and management in agrifood industries in the four study countries. Major findings regarding the overall logistics

FIGURE 5
Distribution of firms based on product types (percentages of total agrifood firms)



Source: authors' elaboration.
Note: "Drinks" refer to beverages such as beer. "Others" includes products such as honey and confectionery.

performance of firms are discussed, along with issues related to transport, infrastructure and information technology.

- *Chapter 4* discusses issues related to policy and how policies support or impede logistics development. Valuable lessons on policies, strategies and other efforts for supporting logistics management are provided.
- *Chapter 5* presents the results of strengths, weaknesses, opportunities and threats (SWOT) analysis of the logistics situation in the agrifood sectors of the countries studied.
- *Chapter 6* presents conclusions and recommendations. The main lessons learned from the appraisal studies and critical areas that require immediate attention are identified.

Chapter 2
The study countries

2.1 BACKGROUND INFORMATION

United Republic of Tanzania

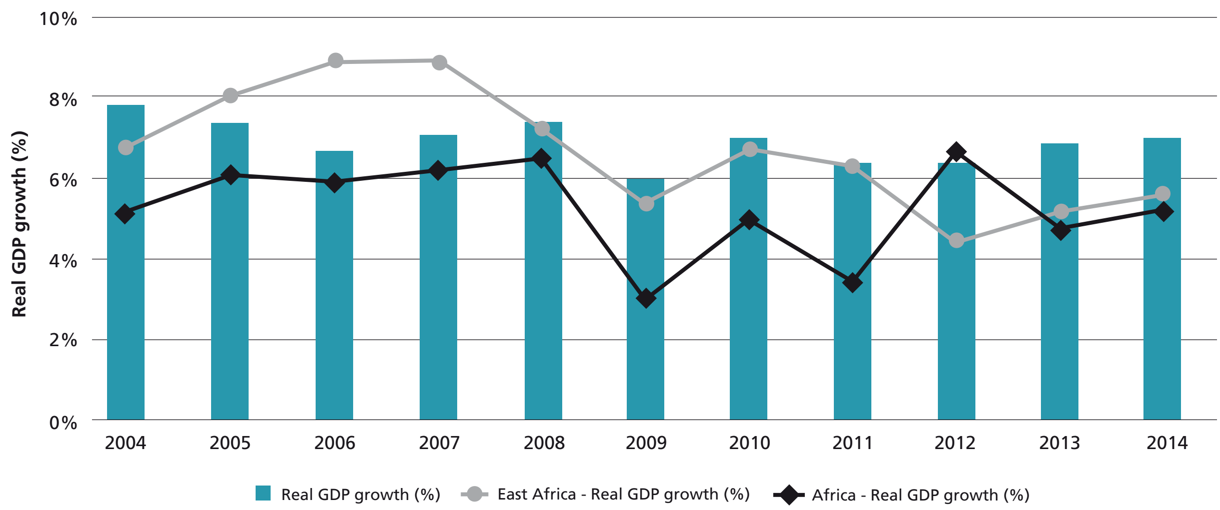
Of the eight countries bordering the United Republic of Tanzania, six are landlocked. The country has a total land area of 890 000 km² and a coastline of 1 424 km. The total population according to the 2012 census was estimated at 44.93 million people (National Bureau of Statistics of the United Republic of Tanzania, 2013). According to the African Development Bank (AfDB), the country has an estimated 86 472 km of roads, of which 12 786 km are trunk roads, 21 105 km are regional roads and 52 581 km are district, urban and feeder roads. Dar es Salaam is the major port, which in 2010/11 handled about 10 million tonnes of cargo. There are two railway systems: the 1 000-mm gauge system is 2 707 km long, and the 1 067-mm gauge system is 1 860 km, linking the United Republic of Tanzania and Zambia (AfDB, 2013).

The main drivers of growth include agriculture, manufacturing, wholesale and retail trade, and transport and communication activities (AfDB *et al.*, 2012). All these drivers require efficient logistics systems for successful operations. The discovery of natural gas is poised to boost significantly the medium-term growth prospect of about 7 percent, as shown in the real GDP growth trends presented in Figure 6.

Uganda

According to African Economic Outlook (AfDB *et al.*, 2012), Uganda's economic growth stabilized in 2012 and real GDP growth in 2012 was 4.4 percent. As indicated in Figure 7, GDP growth was 4.9 percent in 2013 and was projected to reach 5.5 percent in 2014. The recent discovery of oil near Lake Albert in western Uganda has the potential to boost the country's economic growth. Uganda's agro-industries focus on coffee, bananas, tea, cotton, tobacco, cereals, oilseeds, fresh and preserved fruits, vegetables and nuts, essential oils and flowers. After the trade sector, the food processing sector employs the

FIGURE 6
Real GDP growth in the United Republic of Tanzania



Source: AfDB *et al.*, 2012.
Note: Figures for 2012 are estimates; those for 2013 and later are projections.

most Ugandans (Ministry of Finance, Planning and Economic Development, Uganda, 2008); subsectors such as fisheries are important foreign exchange earners (Ministry of Tourism, Trade and Industry, Uganda and UNIDO, 2007).

Micro, small and medium-sized enterprises still constitute the bulk of Uganda's private sector; most small and medium-sized enterprises are located in urban and peri-urban areas. Major features of these enterprises are that they employ family members, apply simple and weak technologies, lack access markets and are unable to compete favourably (Kasekende and Opondo, 2003).

Ghana

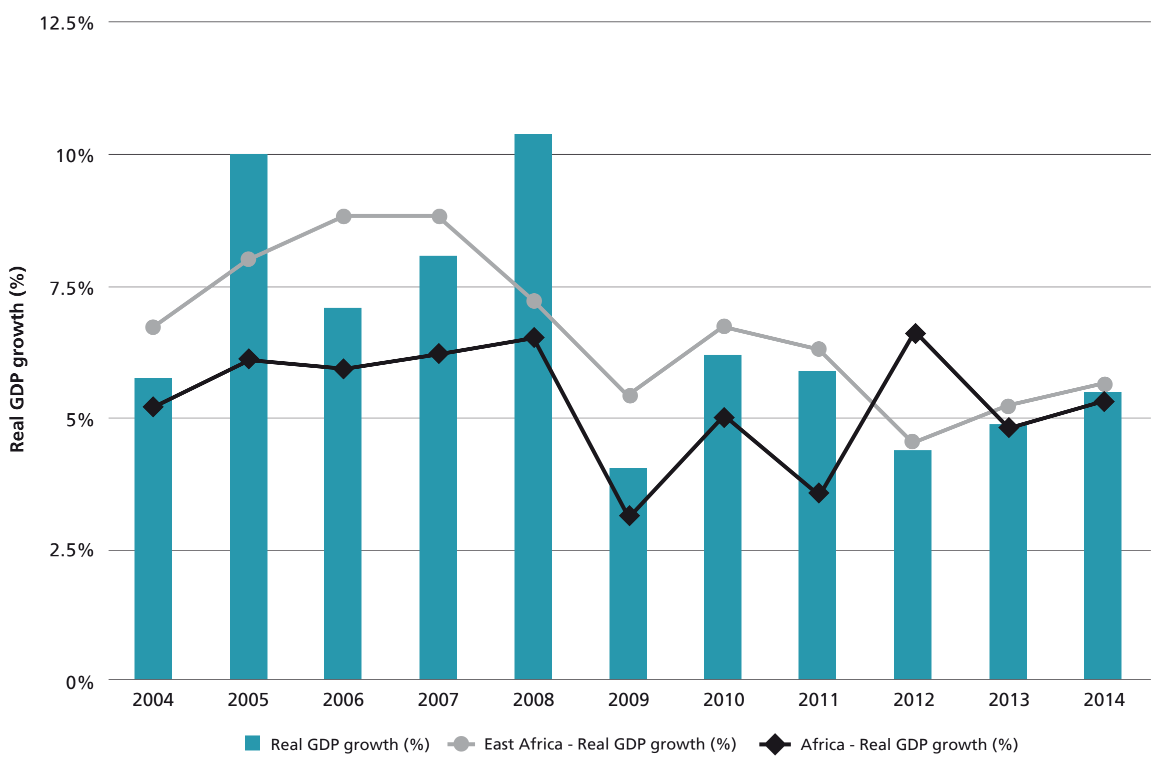
The economic growth of Ghana peaked in 2011, when GDP growth reached 14.4 percent mainly because of the discovery of oil (AfDB *et al.,* 2012). The overall economic growth projections for Ghana look positive, with GDP growth projected at 8.0 percent in 2013 and 8.7 percent in 2014, as shown in Figure 8. As in Uganda, revenue from the oil sector is expected to boost economic development, leading to improvements in public infrastructure and agriculture, including commercial agriculture.

Agriculture plays a central role in Ghana's economic development, contributing more than a third of the country's GDP. Structurally, the agrifood sector has two domains: the traditional and the non-traditional subsectors. Ghana's Medium Term Agriculture Sector Investment Plan aimed to achieve growth in agricultural GDP of at least 6 percent a year for the 2009–2015 period (Ministry of Food and Agriculture, Ghana, 2010). However, according to the Ministry of Food and Agriculture (2007), factors such as lack of technological change and poor basic infrastructure, human resources and managerial skills contribute to slow growth in agriculture.

Cameroon

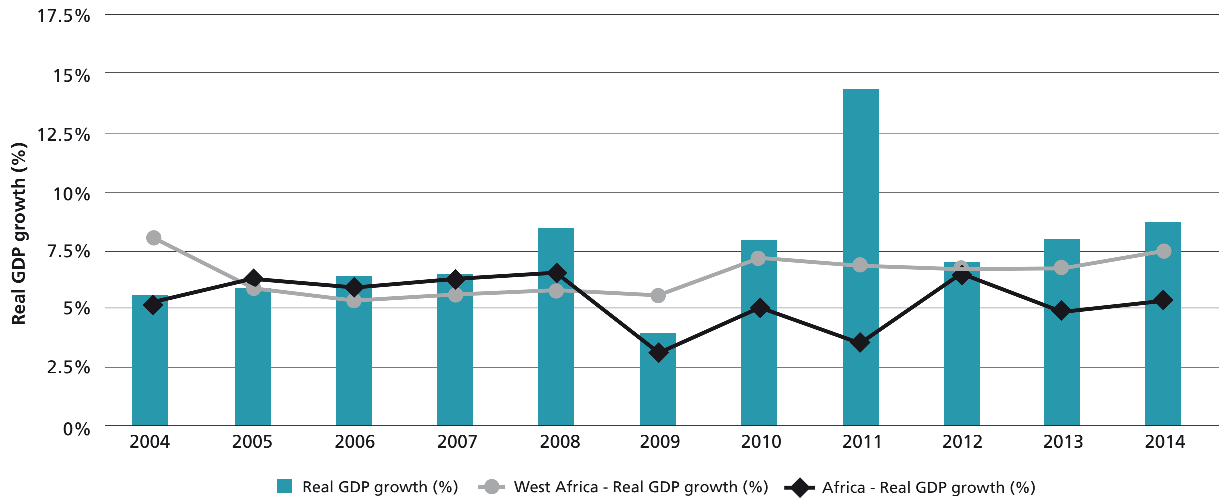
Of Cameroon's estimated territory of 475 650 km², 9 600 km² is covered by sea. The country shares borders with Nigeria to the west, Chad to the north, the Central African Republic to the east and the Congo, Gabon and Equatorial Guinea to the south. In 2014, Cameroon's population was estimated at 22.8 million people, with an average growth rate of 3 percent and a population density of 48 inhabitants per square kilometre (World Bank, 2014). The population is mostly young people: 63.8 percent are under

FIGURE 7
Real GDP growth in Uganda



Source: AfDB *et al.*, 2012.
Note: Figures for 2012 are estimates; those for 2013 and later are projections.

FIGURE 8
Real GDP growth in Ghana

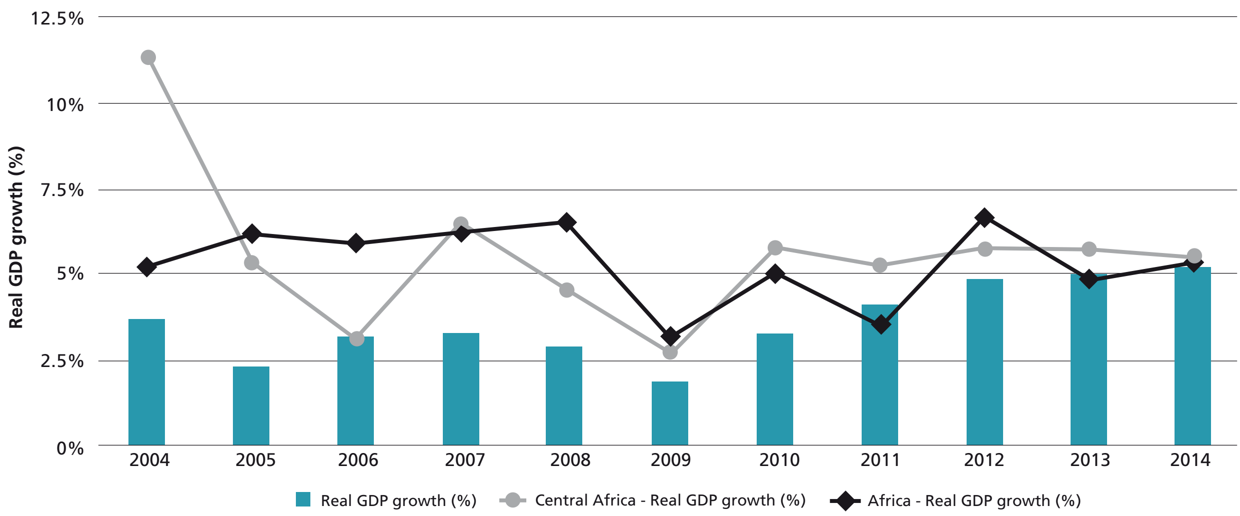


Source: AfDB *et al*., 2012.
Note: Figures for 2012 are estimates; those for 2013 and later are projections.

25 years of age; life expectancy is 51 years; and the literacy rate is estimated at 72 percent. Cameroon is endowed with abundant natural resources. Real GDP growth was estimated at 4.9 percent in 2012, 5 percent in 2013 and 5.2 percent in 2014, as indicated in Figure 9. This growth results from factors such as increased oil production and the commencement of large-scale infrastructure projects. The country was ranked 152nd out of 187 countries in the United Nations Development Programme (UNDP) human development index for 2013 (UNDP, 2014).

The agriculture sector is of vital importance to Cameroon's economy. In 2014, agriculture accounted for 23 percent of the GDP (World Bank, 2014). Agricultural resources are underexploited, and productivity gains are potentially high. Various agricultural products are consumed in rural areas and supplied to urban populations. Over the last three decades, exports from the rural sector have accounted for approximately 55 percent of the country's export earnings, followed by hydrocarbons with 30 percent and the service sector with 15 percent (UNECA, 2004).

FIGURE 9
Real GDP growth in Cameroon



Source: AfDB *et al*., 2012.
Note: Figures for 2012 are estimates; those for 2013 and later are projections.

Given agriculture's vital role in the country's economy, the government has implemented several strategies to develop the sector. Implementation of the most recent strategy is expected to result in production increases of approximately 30 percent between 2001 and 2015 (Ministry of Economy, Planning and Regional Development, Cameroon 2009). Agriculture is also expected to ensure food security and increased incomes for farmers.

2.2 MACROECONOMIC MANAGEMENT

All the countries covered by the study have experienced sustained growth, partly because of the economic reforms that started in the 1990s (World Bank, 2012). When this report was being prepared, GDP was projected to grow by between 5.2 and 8.7 percent in 2014 (Table 3). The main drivers of this growth are telecommunications, transport, financial services, manufacturing and construction, and trade.

2.3 INVESTMENTS IN INFRASTRUCTURE

The efficiency of the logistics systems in any country is closely linked to the development of infrastructure. The development of logistics and electricity infrastructure faces major challenges in much of Africa, impeding growth in many African countries. A study conducted by Ernst & Young (2013) found that power (37 percent) and transport (41 percent) account for the majority of infrastructure projects in Africa, and this trend is likely to contribute to better logistics in the countries concerned. Three of the countries appraised – Uganda, the United Republic of Tanzania and Cameroon – were among the top ten destinations for infrastructure projects in Africa in February 2013 (Ernst & Young, 2013) as indicated in Table 4.

2.4 LOGISTICS PERFORMANCE INDEX (LPI)

In general, data on logistics performance in the surveyed countries are lacking, and the only secondary source of information is the Logistics Performance Index (LPI) developed by the World Bank. The LPI ranks countries' performance in logistics in general, and does not consider specific sectors. However, in the absence of logistics performance indicators for the agrifood industry, the LPI serves as a good overall country indicator, providing a weighted average of a country's scores on six key logistics dimensions: efficiency of clearance; qual-

TABLE 3
Macroeconomic indicators for the study countries

Category	Indicator	Value (%)			
		2011	2012	2013	2014
Cameroon	Real GDP growth	4.1	4.9	5	5.2
	Real GDP growth per capita	1.9	2.8	2.9	3
Ghana	Real GDP growth	14.4	7.1	8	8.7
	Real GDP growth per capita	12.1	4.8	5.7	8.7
Uganda	Real GDP growth	5.9	4.4	4.9	5.5
	Real GDP growth per capita	2.7	1.2	1.8	2.4
United Republic of Tanzania	Real GDP growth	6.4	6.4	6.9	7
	Real GDP growth per capita	3.4	3.3	3.8	3.9

Source: AfDB *et al.*, 2012.
Note: Figures for 2012 are estimates; those for 2013 and later are projections.

TABLE 4
Ranking by number of infrastructure projects in three of the countries studied

Country	Ranking	Number of projects	Total invested (US$ million)
Uganda	4	63	17 730.3
United Republic of Tanzania	9	29	16 185.1
Cameroon	10	25	8 470.8

Source: Ernst & Young, 2013.

ity of trade and transport-related infrastructure; ease of arranging competitively priced shipments; competence and quality of logistics services; ability to track and trace consignments; and timeliness of shipments in reaching their destinations within scheduled delivery times (World Bank, 2012). The LPI results for 2007, 2010 and 2012 for the study countries are given in Table 5.

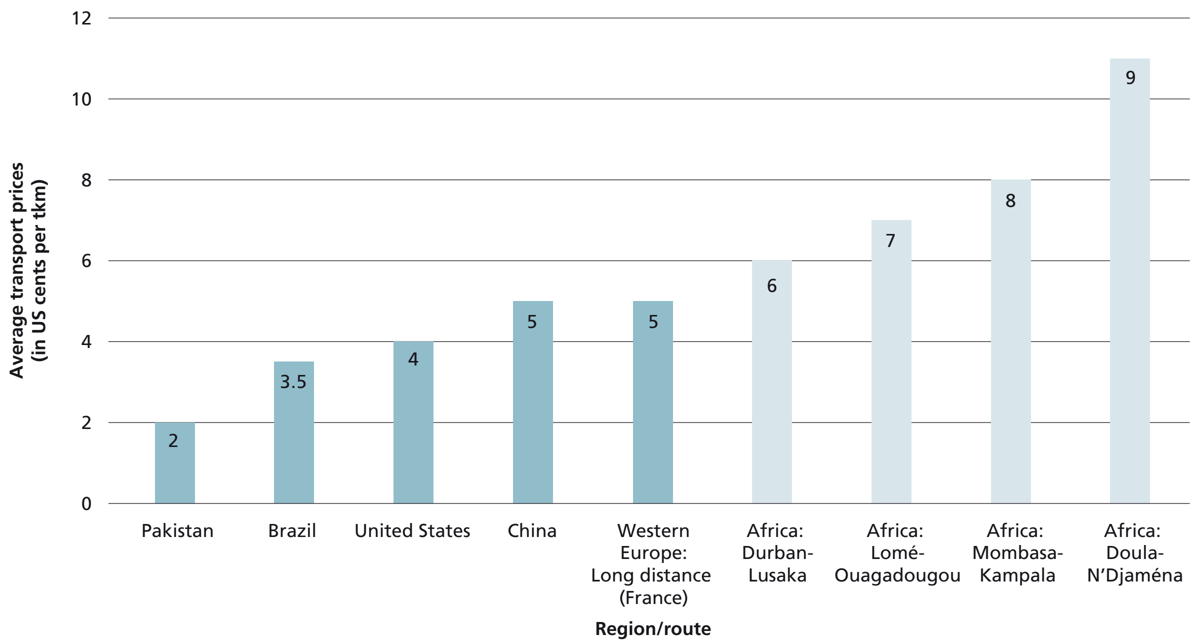
Table 5 shows that the sub-Saharan African countries appraised did not perform well in the world ranking compared with other countries. For example, while Uganda and the United Republic of Tanzania performed better in 2010 than Ghana and Cameroon, they were still far behind the best performers such as Germany (with an LPI of 4.11), Singapore (4.09) and Sweden (4.08). The 2012 results show that the United Republic of Tanzania and Ghana made some improvements in the ranking, whereas Cameroon maintained almost the same position. No data were available for Uganda. It is likely that improved road infrastructure and port operations contributed to the improvements in the United Republic of Tanzania. Logistics challenges in sub-Saharan African countries are also indicated in Figure 10. The transportation prices per tonne and kilometre (tkm) in 2007 were consistently higher in sub-Saharan Africa than other regions. Factors such as the poor state of roads, ageing truck fleets and high fuel costs continue to contribute to this situation.

TABLE 5
LPI of the study countries, 2007, 2010 and 2012

Country	LPI					
	2007		2010		2012	
	Score	World ranking	Score	World ranking	Score	World ranking
Cameroon	2.49	84	2.55	105	2.53	106
Ghana	2.16	125	2.47	117	2.51	108
Uganda	2.49	83	2.82	66	na	na
United Republic of Tanzania	2.08	137	2.60	95	2.65	88

Source: Ernst & Young, 2013.

FIGURE 10
Comparison of global average transport prices per tonne and kilometre, 2007



Source: Teravaninthorn and Raballand, 2008.

Chapter 3
Major findings

3.1 MAIN FACTORS AFFECTING LOGISTICS PERFORMANCE

The findings of the appraisal studies indicated that the status of logistics systems and management of agrifood firms in the four countries were similar in many aspects (Box 1). Overall, logistic performance was affected by both external and internal factors. External factors included lack of adequate infrastructure, such as poor roads and buildings, multiple taxes, lengthy procedures at ports, erratic power supplies, and bureaucracy. Limitations in air transportation and train networks create a need to develop road infrastructure at the national and regional levels, as roads are very important for internal trade as well as the importation and exportation of goods. The main internal factors affecting the logistics performance of agrifood firms were lack of logistics personnel, old equipment, out-dated and poor buildings, poor plant sites and layout causing inefficiencies in operations, old and inadequate vehicles, and lack of storage space.

In addressing these issues, the technical and economic aspects should be taken into account. Overall, the degree to which firms were affected depended on the scale of their operations, with small firms being more affected than medium-sized and large firms. Large firms had better infrastructure, good Internet facilities, better weighing facilities, equipment for quality control systems, good vehicles, storage facilities, and better capacity and experience of logistics management, and they used international standards for labelling.

The appraisal found that site selection for agrifood firms in all the countries selected was based on the availability of land, infrastructure, raw materials, markets, labour force and facilities for import and export activities (especially for large firms). Even small firms were concentrated in towns to obtain access to these services; for example, about 86 percent of the small firms investigated in Cameroon were located in large towns. Other factors in site selection were internal to the firms and varied depending on the size of the firm. The study found that internal infrastructure was generally unsatisfactory for small firms but relatively good for large ones. Among other factors, the overall efficiency of the firms depended on the effective performance of their logistics systems and management. It was also found that irrespective of the country, logistics performance was less satisfactory in small agrifood firms.

BOX 1
Logistics in the four countries

In *Cameroon*, most of the small firms were located in residential areas and used simple equipment for processing and packaging. They lacked reliable supplies of power and water and their performance was further impeded by traffic congestion and poor access to market information. Cold storage was lacking at 86 percent of the small firms visited; where available, cooling equipment was poorly maintained. It was found that 29 percent of small firms used printed labels on packaging materials. Medium-sized firms had larger buildings with several rooms for efficient operations; 43 percent of these firms were located in less densely populated areas with the possibility of expansion. Most large firms had large-scale infrastructure on large areas of land, better utility supplies and large and well-equipped quality control laboratories; some also had large refrigerated warehouses. Their pro-

BOX 1 *(continued)*

cessing operations were mechanized and modern packaging and labelling equipment were used.

In *Ghana*, small firms lacked warehouses, cold chain facilities, appropriate space for storing raw materials, spare parts and standby generators. Most small firms used obsolete equipment and facilities; medium-sized firms faced similar problems but had good packaging equipment, pre-printed packaging material, labelling facilities, scales and sealers, and computerized weighing machinery. Most large firms had good Internet facilities, followed international labelling standards and had better weighing facilities, equipment for quality control, good vehicles, good database management, better use of waybills for tracking purposes, and heavy equipment such as forklift trucks.

In *Uganda*, some firms were hindered by poor logistics facilities, inadequate space, poor plant design, lack of vehicles, inadequate processing equipment, lack of maintenance plans and frequent machinery breakdowns. However, other firms had well-designed plants with sufficient space, enough vehicles, the latest machinery, quality control equipment, and computer packaging and other ICT systems, which helped them boost their logistics performance. For example, about 59 percent of firms used modern machinery, and about 12 percent used ICT tools to support their operations. About 77 percent of the firms investigated in Uganda stated that inefficient logistics systems and management incurred high costs for their business operations.

In the *United Republic of Tanzania*, it was observed that the performance of logistics management in firms dealing with dairy products faced challenges related to milk collection, technology such as for packaging, the cold chain, and issues related to inventories and the distribution of finished products. Good-quality facilities for milking and milk collection were not available. For example, milk was transported to the collection centres by farmers who lacked appropriate cooling and hygienic packaging systems and adequate means of transport for timely deliveries, such as vans with cooling facilities. In addition, quality tests had to be carried out at the milk collection centres as facilities and capacity were missing at the farm level. The costs involved in these processes increased production costs, sometimes making imported products cheaper than locally produced ones and thereby endangering the competitiveness of local products in domestic markets. Lack of appropriate processing equipment and technologies was widely reported by small and medium-sized firms. Most firms lacked appropriate storage and transport facilities for perishable produce, leading to high post-harvest losses in the United Republic of Tanzania. There were few centralized storage facilities, but some firms had their own on-site storage. Although small and medium-sized firms lacked storage facilities, the National Food Reserve Agency has large silos for storing grains at the national level. Medium-sized dairy firms used vehicles with cooling facilities.

3.2 LOGISTICS KNOWLEDGE, ATTITUDES AND PRACTICES OF AGRIFOOD INDUSTRY MANAGERS

Findings from the four countries indicated that in most of the agrifood firms investigated, managers and most of the personnel in charge of logistics activities did not properly understand that the success of an enterprise depends not only on the acquisition and repair of buildings and equipment but also on the effectiveness and efficiency of logistics systems and management.

In general, the firms lacked a good understanding of logistics systems and management. However, they all understood that lack of appropriate facilities and infrastructure for logistics hindered the growth of their firms. For example, in Ghana, about 95 percent of the firms investigated considered that the availability of infrastructure (electricity and water supplies) was the most important factor for selecting a site for their firm; about 75 percent considered that the availability of raw material, labour and markets were also important factors in site selection. Table 6 presents how logistics systems and management are perceived in the four countries; Box 2 describes the situation in the United Republic of Tanzania in greater detail. Table 7 presents the perceptions of personnel in charge of logistics in each country, indicating that levels of understanding and perceptions of logistics differ among agrifood firms operating at different scales. Although these findings indicate the existence of challenges, the firms studied could

BOX 2

Logistics knowledge, attitudes and practices among agrifood firm managers in the United Republic of Tanzania

The study found wide variation in perceptions of logistics depending on the size of the firm. The managers of small companies generally had very limited knowledge pertaining to logistics. Some did not even appreciate that logistics should be treated as a stand-alone management unit within their organizations. There was also a tendency to regard logistics as referring to only the transportation of physical goods inwards and outwards, rather than understanding the broader interpretation of the term as defined in section 1.2 of this report. On the other hand, the managers of medium-sized and large firms seemed to have adequate knowledge of logistics and to appreciate its role as a key factor influencing the performance of the company. These companies had dedicated logistics departments, or embedded logistics in their procurement and supply departments, as at Tanzania Breweries, the Unilever Tea Company and supermarkets such as Shoprite and Imalaseko.

TABLE 6

General perceptions of logistics systems

Country	Perceptions
Cameroon	▪ **Small firms**: Lacked understanding of wider logistics management and tended to associate it with only infrastructure and transport issues. For 86 percent of managers logistics was limited to the possession and management of infrastructure ▪ **Medium-sized firms**: Believed that proper logistics management was crucial for the success of the enterprise, but had limited understanding of logistics ▪ **Large firms**: Had limited understanding of logistics as relating only to aspects such as transport, maintenance of equipment and buildings
Ghana	▪ **Small firms**: Viewed logistics as very important because raw materials and processed goods must be transported ▪ **Medium-sized firms**: Believed that logistics should be emphasized to ensure smooth production operations for the firm ▪ **Large firms**: Viewed efficient logistics management as crucial because logistics plays an important role in all the firm's activities
Uganda	▪ **Small firms**: Viewed logistics as being associated mainly with transport; considered the adoption of proper logistics costly because of the firm's low turnover ▪ **Medium-sized firms**: Had limited understanding of logistics, associating it with the transport of goods and preferring combined in-house and third-party logistics for cost-effective performance ▪ **Large firms**: Had wider understanding of logistics management, considering it an integral part of the firm's overall activities, with a dedicated logistics department managing all logistics activities, including marketing and procurement
United Republic of Tanzania	▪ **Small firms**: Had very limited knowledge of logistics, relating it to only the transport or movement of goods and viewing outsourcing as more efficient ▪ **Medium-sized firms**: Considered logistics to be the key to the company's performance, relating it to the movement of raw materials and finished goods, and believing that proper logistics reduces costs and that combining outsourcing and own transportation is effective ▪ **Large firms**: Had adequate knowledge of logistics, considering it an integral part of the firm's activities and appreciating its role as a key factor in company performance. Considered that logistics includes procurement and marketing

serve as benchmarks or case studies for future in-depth studies.

In Ghana, logistics experts at agrifood firms pointed out that effective logistics management systems included ensuring effective communication with customers, including through ICT, and ensuring high-quality product delivery, such as through efficient cold chain and storage systems and efficient fleet management. The importance of customer satisfaction was well understood by responsible personnel in the firms.

In Cameroon, it was noticed that the managers of small firms lacked wide understanding of logistics management and tended to associate it

TABLE 7
Perceptions of logistics of the personnel in charge of logistics in agrifood firms

Logistics perceived as	Ghana			Cameroon			Uganda			United Republic of Tanzania		
	S	M	L	S	M	L	S	M	L	S	M	L
Infrastructure (external)	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Site selection	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Transport	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Procurement and marketing	✔	✔	✔	■	■		■	✔	✔			✔
Storage, equipment		✔	✔	✔	✔	✔	✔	✔	✔			■
Packaging		■	■	■	■		■	■	✔			■
Information/communication		■	■	✔		✔	✔	✔	✔			■
Order management/stock control/recording		✔	✔	■	✔		✔	✔	✔			■
Labelling/product tracing/ tracking									✔			

✔ = directly mentioned; ■ = indirectly mentioned; S = small firms; M = medium-sized firms; L = large firms.
The tallies indicate that the activity was perceived as a logistics activity by at least one firm but not necessarily all the firms in the category.

with infrastructure and transport aspects only. In medium-sized firms, managers understood the importance of proper logistics management for their firms' success, but they still lacked understanding of logistics management. For example, none of the visited medium-sized firms in Cameroon considered ICT systems and related management to be part of logistics. At large firms too, managers' perceptions of logistics were limited to a few aspects such as transport and maintenance of infrastructure. The managers of large firms perceived inventory control as important for the success of their firms and a key factor in improving the efficiency of logistics management.

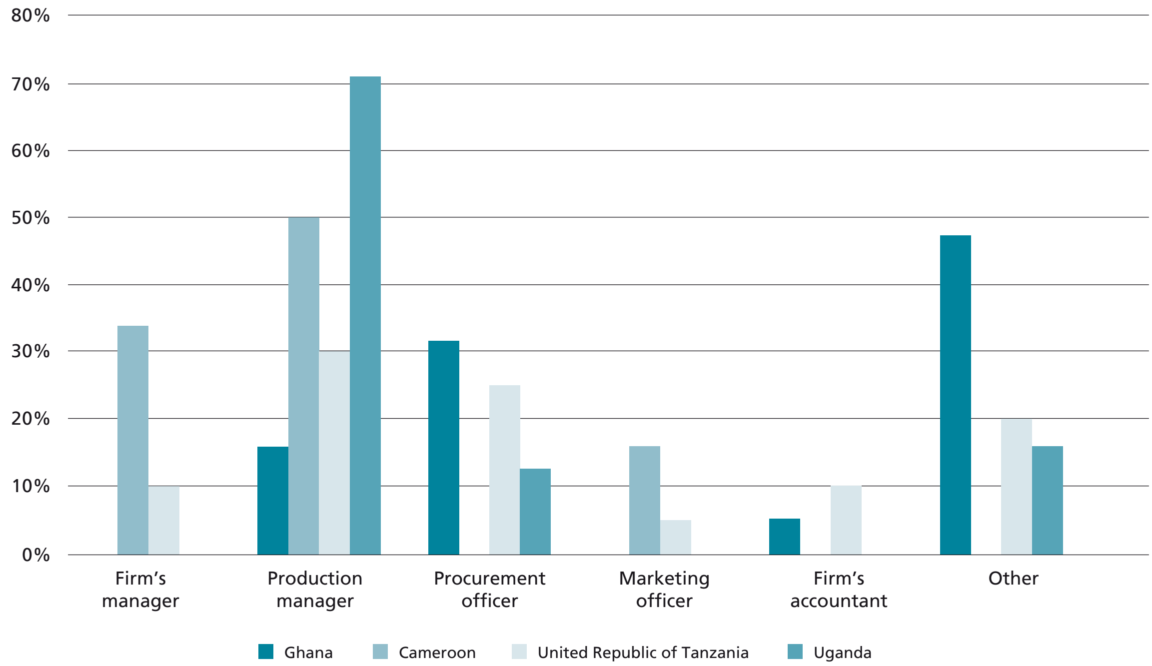
The situation in the United Republic of Tanzania was similar to that in Ghana and Cameroon, with the managers of small firms having very limited understanding of logistics systems. Managers at medium-sized and large firms had better knowledge of logistics systems and management, and some firms had a separate department for logistics activities. Managers of firms investigated in Uganda also had differing understanding of logistics systems. In micro and small firms they related logistics to only product supply, manufacturing activities and product storage. In medium-sized and large firms, managers related logistics to distribution, communication, financing, raw material supply, transport and procurement.

Most small and medium-sized agrifood firms did not have a logistics manager, and logistics activities were managed by the general manager, the production manager or procurement officers. Large firms had better logistics management. Figure 11a indicates that the production manager was responsible for logistics operations in most agrifood firms, particularly in Uganda (about 71 percent) and Cameroon (50 percent). In Ghana, at about 31.6 percent of the agrifood firms investigated, the procurement officer was in charge of logistics, while in the remaining 47.4 percent logistics was managed by other staff including those from materials reception and quality control sections. In the United republic of Tanzania, about 30% of the investigated firms showed that procurement officer was in charge of logistics. Overall (Figure 11b), logistics at about 41.7 percent of the agrifood firms appraised was managed by the production manager; in other cases, it was managed by the procurement officer, the firm's manager, the accountant, marketing officers, or others such as third-party officers.

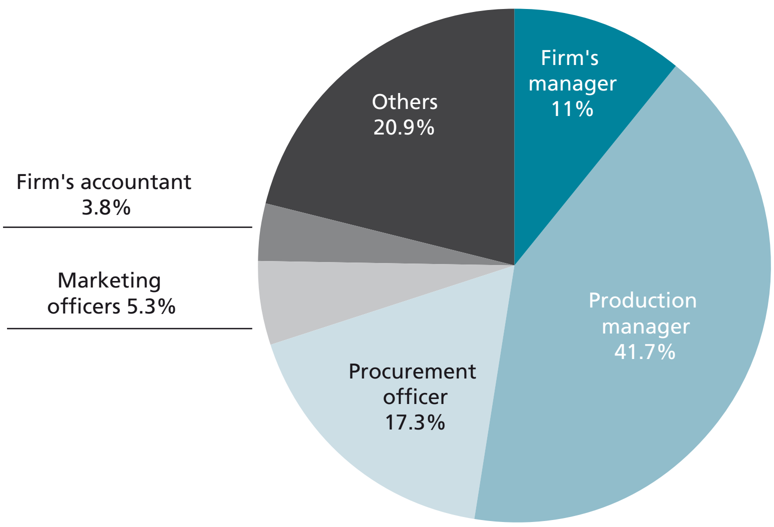
At 65 percent of small firms in Cameroon, customer satisfaction was tracked mainly through feedback from visiting clients. Delivery staff and phone calls were also used to obtain customer feedback. Problems were solved rapidly and clients' suggestions were used to guide improvements. Quality control and technological standards were almost non-existent, except for physical observation and some cases of using experts from other companies or branches for quality control. Some small firms received assistance in the form of training and capacity building from the government or other organizations, but about 86 percent of them received no financial assistance from other organizations. Some medium-sized firms received financial and technical support from the government and other organizations. Most large firms did not receive any financial assistance, but the government's creation of industrial zones has boosted the performance of large firms as these zones are located close to urban areas, with well-maintained roads linking them to intercity roads facilitating the movement of materials into and out of production sites. In addition, water and electricity are readily available for all the enterprises in these industrial zones.

FIGURE 11
Officers responsible for logistics management (percentages)
(a) By country (b) Aggregated among the 76 agrifood firms

(a)



(b)



Source: authors' elaboration.

Managers of large firms had better perceptions of and attitudes to logistics matters than managers of medium-sized firms. They also invested in improving their logistics systems and management by acquiring better storage facilities, ICT tools, vehicles, standby generators and water reservoirs, and better-trained personnel for maintaining equipment and managing logistics activities. However, even large agrifood firms lacked a holistic view of logistics in the agrifood chain and generally paid more attention to outbound transportation than to operating/operation logistics. Understanding the whole supply chain of their products is very important to agrifood companies, most of which are involved in the processing and supply of perishable produce, which require effective logistics systems. It should also be noted that inadequate logistics services are associated with product loss, damage and food contamination at different stages of the food supply chain (Bosona, 2012).

3.3 LOGISTICS EFFICIENCY IN THE AGRIFOOD INDUSTRY

Improvement of a firm's logistics performance contributes to better performance as a whole. Logistics performance is determined by three main elements: logistics efficiency – the ratio between resources utilized and the derived results; logistics effectiveness – the ratio between real output and expected output; and logistics differentiation – the firm's superiority to competitors (Fugate, Mentzer and Stank, 2010). According to this definition of logistics efficiency, the lower the ratio of resource use to derive results, the more efficient the logistics activities. This indicates that good logistics efficiency implies wise resource utilization.

More effective logistics activities result in significant reduction of logistics costs along the whole value chain and the achievement of objectives such as fulfilling product guarantees and timely deliveries to customers. The appraisal studies found that deliveries were usually based on orders from clients, mostly via the Internet and telephone. Supply was sometimes delayed by a lack of raw materials and communication barriers, which affected customer satisfaction. Inventory control and order management were mainly through manual operations, with computer software used in very few cases. Inefficiency was also noticed in quality control, packaging, labelling, traceability, ICT utilization, and acquisition and use of storage and cold chain facilities.

The logistics differentiation reflects the comparative net value that efficient logistics could add to a firm. The more comparative net value added, the more competent the firm's logistics. For instance, some of the firms visited in Ghana had problems competing in the market because inefficient logistics led to low-quality products. The appraisal study in Cameroon also found that enterprises exporting products to developed countries in Europe and North America often faced logistics challenges related to quality control. Most of the enterprises lacked the necessary technologies and personnel to ensure that their products conformed to international standards and regulations. Quality control was through physical observation, sometimes at advanced laboratories, but international standards were missing in all cases. As a result, the firms' products were either returned or downgraded to inferior grades, translating into lower market prices. The appraisal studies also indicated difficulties with the tracking and traceability of goods exported to neighbouring countries or Europe, which affected the competitiveness of firms. Even in domestic trade, the tracking of goods during transportation (mainly using mobile phones) was often difficult because of the poor telephone network, thus impeding logistics management.

Problems associated with packaging, such as poor seals and unclear labelling, were also common in agrifood firms. In some cases, labels were printed directly on to the packaging material, but in others – especially at small firms – labels were attached to packaging manually, which was not very efficient and durable throughout the supply chain. In Cameroon, for example, inefficient packaging practices impeded logistics management with labels sometimes being delivered late and manual labelling being painstakingly slow. This situation recurs in many companies throughout sub-Saharan Africa.

Governments and agrifood firms have made efforts to improve logistics performance within firms and the overall performance of the agrifood sector. For example, companies in all countries may use their own transport facilities, combine their own transport with outsourced services or outsource all their transport needs. Firms invested in modern and more efficient equipment and ICT tools, and trained employees in more efficient resource use and the creation of added value for their customers.

Findings from the study in Ghana indicated that outsourcing of transport fleet management was more economical for medium-sized and large firms as they had large consignments. These firms often managed their own outbound transport services while usually outsourcing inbound transport. For small firms, transport performance was affected by a lack of suitable vehicles and poor maintenance of vehicles. In medium-sized firms, transport services were influenced by the availability of spare parts, the quality and costs of vehicle maintenance, and inefficient ICT systems for tracking goods in transit. For large firms, traffic problems constrained the timely delivery and quality of products.

Small firms in Cameroon used their own vehicles or public transport when small quantities were purchased. Firms dealing with perishable produce used vans without refrigeration, which could reduce the quality and shelf-life of the produce. Only one of the small firms visited in Cameroon outsourced transport services, using a sister branch to transport goods. Reports from the United Republic of Tanzania indicated that use of own transport was not cost-effective for small firms.

Almost all the agrifood firms investigated in Ghana had no experience of stock shortages, as goods were usually produced to order according to clients' quality, quantity and other specifications, especially for medium-sized and large firms. About 35 percent of firms conducted customer satisfaction surveys, registering average customer satisfaction of about 87 percent, which indicates relatively effective logistics activities. Most small firms, used "just-in-time" practices to manage raw material supplies, and first-in, first-out systems for managing customers' orders. At most large firms, production and marketing managers or the logistics and quality assurance department managed the first-in, first-out system, with tagging of batches. Finished products were stored separately at the right temperature and moisture level. About 90 percent of the firms visited in Ghana used technological systems for quality control, boosting their competitiveness.

At small firms in Cameroon, customers made non-binding orders by phone, which were delivered by transporters within approximately 12 hours. These firms planned their procurement of raw material and their production of goods according to consumer demand and did not store large quantities of raw materials. In medium-sized firms, orders were made via phone calls, with invoices. The use of computer programs to manage orders was very limited, but about 70 percent of large firms managed orders through invoices submitted through the Internet, with delivery times usually of about 48 hours. Deliveries could be delayed by interruptions in the supply of raw materials or in Internet connectivity. Stock was managed by a manager, using a fully computerized inventory control system or manual counting of stock.

In Uganda, efforts to improve logistics performance in agrifood firms included linking agrifood firms to sources of financing, introducing traceability technologies (radio frequency, bar codes, online tracing of shipments) and using stock management software and computerized inventory control.

3.4 MAIN LOGISTICS CHALLENGES AND CONSTRAINTS FACING AGRIFOOD FIRMS

The agrifood sector faces multiple and complex challenges in mitigating crises in food security, including in its logistics. Logistics challenges include inadequate and inefficient infrastructure (external factors), lack of effective logistics systems and management (internal factors) or both. The lack of infrastructure aggravates the internal logistics problems of all industrial firms, particularly agrifood firms, which often deal with perishable produces. Specific external factors that negatively influenced the logistics performance and growth of the agrifood firms studied included:

i) lack of support from financial institutions, especially for small and medium-sized firms;
ii) inconsistencies in national policies;
iii) marketing problems;
iv) unfair tax burdens on agrifood firms compared with firms that import agrifood products, which may enjoy tax concessions;
v) non-tariff barriers such as road blocks;
vi) unfair competition;
vii) inadequate road networks and poor road conditions (Figure 12);
viii) high and fluctuating fuel costs;
ix) high costs and irregular supplies of electricity and water;
x) poor or lacking communication networks.

Erratic water supply, power interruptions and lack of standby generators were major problems reported in all studies. Other external factors such as government bureaucracy and environmental issues also influenced the performance of logistics systems and the operation of firms.

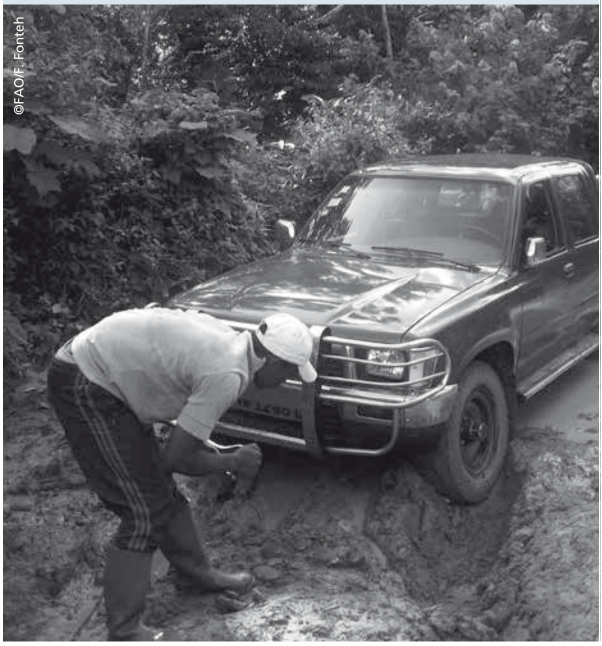
The main internal logistics challenges identified by the studies in the four countries were:

i) lack of modern technology such as ICT;
ii) lack of raw material supplies;
iii) high costs of packaging and labelling materials;
iv) heavy traffic and cargo delays at ports;
v) high costs of hiring and training qualified human resource in logistics management – fleet management, inventory, traceability and quality control;

vi) inadequate and inappropriate warehousing and storage systems;
vii) out-dated/inefficient processing equipment, quality control equipment, machinery and vehicles;
viii) high maintenance costs;
ix) poor access to market information and market outlets;
x) long-distance deliveries;
xi) seasonal variability of raw material supplies;
xii) lack of effective waste disposal systems, especially for small firms.

Product quality was another challenging area for the agrifood sector. For large enterprises, especially those exporting products to other countries, more coordination of logistics is required to ensure the maintenance of product quality and timely deliveries. The study in Ghana noted that food quality started with the quality of raw materials and packaging inputs. To improve the quality of raw materials while reducing their weight and costs, some firms trained supply agents in pre-processing raw materials. For exporting companies, traffic was a major constraint affecting the efficient performance of transport services, especially regarding access to international airports. Traffic conditions were directly linked to the timely deliveries and food quality that are crucial for all companies exporting their produce, especially perishable goods.

FIGURE 12
Logistics challenges – a feeder road during the rainy season in Cameroon



In Ghana, all the firms investigated implemented the Hazard Analysis and Critical Control Point (HACCP) system, as required for certification by the Ghana Standards Authority. Most small firms carried out only limited quality control by physical observation, while some medium-sized firms had small or more developed laboratories, but international standards or regulations were not applied. Unlike large firms, most small firms did not store raw materials but used the principle of just-in-time supply. Large firms had relatively good storage and quality control systems and applied first-in, first-out inventory control.

High logistics costs hinder the growth of agrifood firms and contribute to higher prices of processed goods, jeopardizing the competitiveness of firms in the market. The appraisal studies found that unfair competition from cheaply produced, imported goods threatened the performance of agrifood firms in domestic markets. Unfair competition was one of the concerns raised by firms in Uganda and the United Republic of Tanzania. Logistics costs were also increased by rising fuel costs, multiple taxes, the high cost of packaging materials, shortages and irregular supplies of raw materials, and limited access to loans or other sources of financing. However, owing to their limited understanding and monitoring of logistics, many of the agrifood firms investigated were unable to quantify the costs associated with poor logistics and management systems. Detailed studies are required to quantify the cost implications of poor logistics systems and management on companies' performance.

3.5 COMMUNICATION AND INFORMATION SHARING IN AGRIFOOD FIRMS

Communication is the key to ensuring information flow and enhancing logistics management. The findings indicated that only basic ICT services – mobile phones, Internet access, wireless connections, telephone/fax, e-mail, bar coding, etc. – were utilized. More complex systems such as Global Positioning Systems (GPS), specialized software, online tracking and electronic data interchange were less common. The agrifood firms in the study interacted with their customers via telephone, site visits, e-mail, and Web sites (especially larger firms). Mobile phones were an important and widely used means of communication among the firms.

ICT provides valuable tools for coping with challenges in the agrifood industry (Schiefer, 2004). ICT components and applications should therefore be integrated into agrifood activities to support modernization of the agrifood sector. For example, all the large firms studied in Cameroon had landline telephone connections, computers and photocopy machines, with mobile phones for all senior staff. However, a weak telecommunications network and inadequate software programs hindered the efficient use of ICT systems. Where up-to-date ICT was introduced, fleet management and the training of logistics personnel improved. These large firms require better maintenance services and equipment to improve their logistics performance.

Even small firms can use modern ICT tools for inventory control and creating networks with other agrifood firms or business partners. For example, some of the firms visited in Ghana used vessel tracking software to track shipments of exported fresh produce with short shelf-life (of up to seven days). Although ICT systems were important for effective communications among supply chain partners and for process controls, some managers of investigated firms did not consider ICT an integral part of logistics systems. These findings imply the need for training in addressing issues related to logistics systems and management.

The importance of effective communication networks attracted attention at the policy level. For example, the study in the United Republic of Tanzania indicated that the improved national network for telecommunications and Internet connectivity was reaching almost all regional offices, but Internet connections were sometimes interrupted by electricity shortages or outages, affecting firms' ability to manage orders and maintain customer satisfaction. Tackling these barriers to communication will require coordinated efforts by external service providers, such as communication companies as well as the governments.

3.6 IMPROVING LOGISTICS SYSTEMS AND MANAGEMENT

At both the government and firm levels, efforts were made to support the development of efficient logistics systems to enhance the performance of agrifood firms. These efforts included establishing policies and strategies and improving infrastructure – road and telecommunication networks, water and power supplies, etc. – ICT facilities and training programmes. Efforts at the firm level included investing in modern processing equipment, ICT facilities, appropriate warehouse and storage systems with cold chain facilities, appropriate vehicles, quality control equipment, packaging machinery, and facilities for product tracking. Table 8 summarizes the efforts made to improve logistics systems and management.

Adopting logistics systems and management practices from non-agrifood industries

The managers of non-agrifood firms understood that logistics activities constitute a major area of operation for their firms. In the non-agrifood firms investigated in Ghana, logistics activities constituted up to 60 percent of overall operations. These firms therefore made efforts to improve their logistics performance by: i) establishing good relationships with their customers; ii) providing training for the personnel in charge of logistics and for the firms' drivers; iii) improving packaging materials; iv) improving route planning for efficient transportation; v) motivating employees; vi) acquiring modern equipment and on-site maintenance services; vii) using modern means of communication and ICT systems; and viii) outsourcing some logistics services. Most of the non-agrifood firms investigated in Uganda used ICT facilities for advanced functions such as online monitoring of production performance and projection of market demand.

Some of the practices of non-agrifood firms could be adopted by agrifood firms. For example, firms that import or export products could form a network with business partners in another country to facilitate some logistics activities. Instead of using standby generators, firms could explore the options for using solar energy sources. Some non-agrifood firms had very dynamic marketing agents to follow the market situation and customer needs. Although the agrifood firms investigated had no problems with product demand (demand was higher than supply), they too could employ dynamic marketing agents to continue improving the quality of their products and ensuring customer satisfaction. Other practices that could be adapted from non-agrifood firms include introducing incentives for employees who execute excellent work and recruiting multi-skilled staff in appropriate work units.

Small, medium-sized and large agrifood firms reported outsourcing transportation and other logistics services, such as maintenance and insurance, to other companies to ensure efficient movement of raw materials and processed goods. Non-agrifood firms outsourced traceability services as ICT tools are expensive, but this might not work in the agrifood sector where traceability requires a high level of trust and the sharing of sensitive information and data among supply chain partners (Bosona and Gebresenbet, 2012).

TABLE 8
Actions taken to improve logistics systems

Country	Actions*
All countries	• Implementing logistics-related policies • Investing in logistics facilities • Providing training for personnel responsible for logistics activities • Selecting appropriate sites for firms • Outsourcing some logistics services, mainly transport services • Using ICT systems, particularly basic ones such as mobile phones
Cameroon	• Creating pilot centres for demonstrating agrifood processing, e.g. milk processing • Investing in facilities such as laboratories, cold chains and packaging equipment • Providing computer training • Supervising the production of raw materials to ensure quality control
Ghana	• Creating linkages between smallholders and large agrifood firms • Upgrading and establishing new warehouses (and silos) with improved warehouse management systems • Installing back-up generators to ensure sustainable supplies of electricity • Transporting fish and meat at night as part of cold chain management • Investing in modern cold chain facilities • Recruiting well-trained logistics managers • Applying the principles of supply chain management
Uganda	• Providing training on operational and business management • Linking agrifood firms to sources of finance • Hiring skilled drivers and strengthening maintenance services • Designing appropriate plant layout and storage facilities • Applying traceability technologies such as radio frequency, bar codes and online tracking of shipments • Applying technological standards such as HACCP and good manufacturing practice (GMP) • Introducing stock management software and computerized inventory control • Investing in storage facilities • Recruiting qualified personnel • Stocking sufficient raw materials when possible
United Republic of Tanzania	• Identifying nine road transport corridors to be developed by government to facilitate the enhancement of agri-food industries; construction of some roads is already under way • Installing a national optic-fibre system enabling the national telecommunications network to reach all regional offices • Ensuring that firms' chiefs undertake the logistics management at small and medium-sized firms dealing with perishable products, as mismanagement of logistics can cause great losses • Establishing separate logistics departments at most large firms to improve the management and reduce the costs of logistics • Reducing dependence on municipal utilities such as power and water supply in the long term • Expanding small firms' businesses and increasing their capacity to invest in logistics systems

* The activities listed were reported by at least one firm but not necessarily all the firms in the country.

Opportunities for improving logistics systems and management in the agrifood sector

The appraisal studies identified conditions that provide important opportunities for improving logistics systems and management to increase the performance and growth of agrifood firms. These conditions were: i) the high prices and demand for quality goods on domestic and international markets; ii) good export conditions, particularly in the three countries that are not landlocked and where maritime transport is increasing; iii) the availability of processing technologies and experience; iv) supportive government policies; v) the availability of labour; vi) the possibility of outsourcing some logistics services; vii) the availability of institutions for quality assurance and safety management; viii) possibilities for increasing the production of raw materials locally where labour, fertile arable land and animal stocks are available; ix) improving infrastructure such as road and communication networks; x) understanding of the value of agrifood logistics; and xi) the availability of relatively good logistics expertise and facilities at large agrifood firms, which can be used as the basis for enhancing the capacity of small and medium-sized firms.

Cameroon, Ghana and the United Republic of Tanzania have good opportunities for facilitating trade via their seaports. For example, Ghana has an effective tracking mechanism for transit cargo, speedy clearance at land borders, and safe movement of trucks between entry and exit points. Geographic and climatic conditions are very favourable for agricultural production (particularly in Cameroon and Uganda), providing additional opportunities for development of the agrifood sector. In some African countries (e.g. Cameroon), employees are bilingual and can understand the languages spoken in neighbouring countries, thereby facilitating the business and logistics operations of firms trading with neighbouring countries or working with business partners in these countries.

The demand for tropical products such as fruits and vegetables from developing countries is constantly growing, providing good opportunities for development of the agrifood sector in sub-Saharan Africa, particularly for agrifood firms that export their produce. For example, Cameroon's agrifood industries exported a wide range of fruits, including bananas, pineapples, papaya and mangoes, and some vegetables. However, the efficiency of exporting such products depends on the reliability and frequency of air transport; unreliable air transport leads to logistics management challenges and product losses.

Various government initiatives have been developed and implemented to enhance the agrifood sector, but many of these projects have failed (e.g. in Cameroon). Failures were also reported for some financial initiatives. To mitigate these failures, governments have started to reduce their own direct involvement in projects and are encouraging private investments in the agrifood sector. The study in Cameroon indicated that some microfinance institutions provided very significant financial assistance to local small and medium-sized enterprises, particularly in the agriculture sector; microfinance institutions were very important catalysts for the development of small and medium-sized enterprises in Cameroon. Although these financial institutions have fewer resources than banks and financial houses, their impact in rural development continues to increase.

3.7 REQUIREMENTS FOR ENHANCING LOGISTICS MANAGEMENT IN THE AGRIFOOD SECTOR

Product quality issues and post-harvest losses are encountered throughout the supply chain, and there is an urgent need to address these challenges in the agriculture sector by maintaining product quality and/or adding value in the supply chain. Improving logistics management has a significant role in this regard. Standardization, improved quality control and value adding activities are needed to ensure supplies of quality products while remaining competitive in the market. Increasing agricultural production and ensuring the supply of sufficient and quality raw materials from local sources is essential. For example, reports from Uganda indicated that firms producing raw materials locally and applying quality control could satisfy their customers and fulfil up to 100 percent of their orders. The improvement of linkages among producers, processors, researchers, markets and financial institutions helps to solve logistics problems.

Improved logistics systems and management can best be facilitated by improving infrastructure such as water and electricity supplies, telecommunications and financial services, which greatly enhance the efficiency of firms' logistics management. Introducing new technologies such as ICT and appropriate software is also important for agrifood firms. Small firms need cooling facilities, appropriate equipment and vehicles, skilled personnel, financial support and additional buildings for medium- and long-term expansion. All the firms appraised, particularly small and medium-sized ones, need well trained drivers, appropriate vehicles, equipment such as standby generators, water reservoirs and packaging equipment, relevant ICT tools and more land for expansion.

Large firms need quality control in line with international standards, as these firms serve both domestic and international customers. For this and for further expansion, they need reliable supplies of water and electricity, including standby facilities; training, especially in quality control, product traceability and utilization of new ICT tools and software; more land and buildings; and sources of finances. Companies involved in import and export activities also require revision of bureaucratic policies and procedures.

The findings pointed out that governments' role should focus on improving infrastructure such as road and communication networks, water and power supplies and marketing areas and facilities, and strengthening links between financial institutions and firms. Governments should also encourage the formation of networks of agrifood firms, to help the firms identify and solve their common problems and share good experiences, especially in logistics operations. Another important role for governments is to create an enabling environment for development of the agrifood sector by increasing political will and commitment to developing policies and implementing effective strategies.

The firms themselves should focus on overcoming hindrances to their logistics, including by investing in logistics training and purchasing appropriate vehicles, storage facilities and ICT tools. In Cameroon, it was observed that some of the firms that were not investigated were rivals to those studied, despite facing common problems and having common interests; networks or associations of agrifood firms would enable them to promote their businesses and mitigate their common challenges and problems.

Firms could also improve their logistics performances by optimizing product movement during processing and synchronizing the flows of raw materials with processing rates/capacities and the outflow of finished goods. These improvements could be facilitated by relevant ICT tools. Collaboration, integration and optimization of the supply chain are important and should be enhanced. Cooperation is particularly important among small firms and farmers, enabling them to use emerging digital environments (IT technologies) to boost the development of agrifood industries (Schiefer, 2004).

Some of these issues can be addressed through joint action by governments and firms. For example, policy implementation and infrastructure development can be facilitated by strengthening dialogue between the two parties. It is also essential for both governments and firms to take joint action on improving transparency on regulatory aspects, especially through accurate reporting of production volumes, fair taxation and simplified procedures and bureaucracy in government offices.

Chapter 4
Policy issues and their support or hindrance of logistics systems

4.1 POLICIES, STRATEGIES AND OTHER SUPPORT TO LOGISTICS MANAGEMENT

The investigated countries each have their own policy environments for boosting the agrifood sector. In most cases, the policy issues concerning development of the agrifood sector were similar. Major goals common to all four countries were: i) poverty reduction; ii) development of small and medium-sized enterprises; iii) improving infrastructure; and iv) becoming a middle-income country. For example, in Ghana, issues related to logistics are addressed in trade and industry policies and medium-term agricultural investment policies, which include the Food Security and Emergency Preparedness Programme for improving food storage and distribution systems and reducing post-harvest losses and poverty.

The Government of Cameroon has a Ministry of Small and Medium Enterprises, Social Economy and Handicrafts to execute its poverty reduction strategy. The ministry has established the Support Programme of Creation and Development of Small and Medium Enterprises for the Transformation and Preservation of Staple Local Foodstuffs, which is based on successful pilot projects involving farmers and small and medium-sized agrifood processing firms. The Government of Cameroon also has a long-term vision of eradicating poverty and becoming a middle-income country by 2035 by increasing agricultural production, agrifood industries and logistics infrastructure. More information on policy-related issues is given in Table 9.

The Government of the United Republic of Tanzania has set a development vision for 2025 that includes supporting small and medium-sized agrifood industries to help reduce poverty and to attain middle-income country status. This vision includes increasing investment in infrastructure from government and private resources. The government has also enacted policies for small and medium-sized enterprises by promoting infrastructure and rural development.

The policy framework of Uganda prioritizes the development of small and medium-sized enterprises as part of efforts to transform the country into a middle-income country, including through the economic recovery programme, the national micro-small-medium enterprise development plan and the poverty eradication plan. Other policies and strategies that support development of the agrifood industry include the revised poverty eradication action plan and the medium-term competitiveness strategy for the private sector. Most of these policies and plans address infrastructure issues such as road networks and transport facilities, air- and seaport facilities, freight transport, reliable supplies of electricity and water, improved communications and financial services. Infrastructure is an important external factor that significantly affects the performance of logistics systems and management in agrifood firms and, consequently, the performance of the sector as a whole. Policies also address – directly or indirectly – the logistics problems of agrifood industry firms. For example, improved supply of electricity will enhance performance in production, warehouse management, information exchange and overall logistics management.

The governments of Ghana and the United Republic of Tanzania have policies that support logistics for the supply of local agricultural materials by promoting the acquisition and development of modern technologies, plant and machinery and the provision of electricity, water, telecommunication and ICT services. Ghana's food security and emergency preparedness programmes deal with food storage, distribution, links between producers and markets, and reduction of post-harvest losses. In the past, similar policies in Cameroon and the United Republic of Tanzania have met with mixed success. In Cameroon, for example, many policies and strategies for promoting the agrifood sector have not had the impacts expected, indicating problems in their implementation; problems with infrastructure

TABLE 9
Major policy issues and plans in the four countries

Country	Policy and strategy plans
All countries	▪ Poverty reduction ▪ Improving infrastructure ▪ Development of small and medium-sized agrifood firms ▪ Forming institutions for policy implementation
Cameroon	▪ Creation and development of about 150 small and medium-sized agrifood firms (in 2007–2012) to serve as centres for transformation of major local food products ▪ Policies that encourage the private sector's involvement in the industrial sector, focusing on the agrifood sector ▪ Promotion of agricultural development (30% increase), especially agroprocessing, focusing on the value chain, standardization and quality of agrifood products ▪ Improvement of infrastructure such as power supply, water supply, transport networks, ICT systems ▪ Improvement of the quality of financial services provided to private investors (agrifood firms) by banks, and encouragement of microfinance institutions
Ghana	▪ Agricultural logistics addressed mainly by trade and industry policies and medium-term agricultural investment plans ▪ Transformation of the agriculture-led economy into an industry-driven economy by 2020 ▪ Imports of competitively priced raw materials and modern equipment ▪ Creation of linkages among producers, processors and markets, and reduction of post-harvest losses through improved warehousing, agroprocessing, packaging and distribution
Uganda	▪ Assistance to agrifood firms from the Uganda Investment Authority, the Uganda Revenue Authority, the Uganda National Bureau of Standards and the Uganda Small Scale Industries Association ▪ Enhanced logistics management of agrifood firms ▪ Creation of a favourable business environment with reduced regulatory hurdles, and links between small and medium-sized firms and sources of finance, facilitated by the Uganda Investment Authority ▪ Organizations providing business information to agrifood firms ▪ Promotion of research and development to help agrifood firms improve the quality of their products
United Republic of Tanzania	▪ Use of technology and domestic agricultural resources to develop the agrifood sector ▪ Promotion of consolidated financial support for agro-industries and of private-sector investment in banking services ▪ Efficient use of infrastructure and local resources ▪ Promotion of ICT systems ▪ Adaptation of new technologies and networking between research institutions and agrifood firms ▪ Efficient energy utilization, and provision of sufficient energy for agrifood activities ▪ Reduced dependence on imported energy ▪ Provision of tax incentives ▪ Promotion of investments in commercial farming, agrifood processing industries, export processing and industrial parks

and other logistics facilities were widely reported in Cameroon's appraisal report. Inconsistencies in policy, government bureaucracy and lack of political commitment were reported as the main hindrances to policy implementation. In many cases, logistics issues in the agrifood sector are handled by several ministries and/or federal and local governments, which can increase the procedures and bureaucracy required for policy implementation.

4.2 MAJOR LESSONS ON POLICIES

Policy choices determine the future prosperity or poverty of a country. Poverty is not merely the result of a lack of resources, as many resource-poor countries have become rich while many resource-rich countries in Africa remain poor (Yumkella *et al.*, 2011). Economic policy and strategies in sub-Saharan Africa should promote agribusiness rather than depending mainly on oil and mining. Africa has enormous potential for development if it uses its abundant natural resources – land and water – efficiently (FAO, 2009). Some countries have realized this and have drafted policies to enhance the agrifood sector. For example, the Government of Uganda considers micro, small and medium-sized enterprises in the agrifood sector as important actors in economic development and in transforming the rural poor and jobless into a middle-income industrial class. The agrifood sector can also have an important role in creating sustainable long-term economic growth if supported by appropriate development and poverty reduction policy and actions.

Chapter 5

Outcome of the SWOT analysis

To assess the strengths, weaknesses, opportunities and threats (SWOT) in the four countries, a SWOT analysis was conducted (Tables 10a, 10b, 10c and 10d). Major strengths identified included good selection of locations for firms, design and implementation of policies for improving logistics performances, and investing in modern equipment and ICT systems. Weaknesses included the inability to provide training and increase understanding of logistics, invest in new machinery and equipment, obtain access to sources of financing and raw materials, invest in standby power and water supply, and ensure information connectivity. Issues such as underdeveloped rural road networks, policy inconsistencies and government bureaucracy, high logistics and fuel costs, production interruptions and seasonal variability of raw material supplies, interruptions in the provision of power, water and information, and the potential effects of climate change on agricultural productivity in sub-Saharan Africa were noted as potential threats to development of the agrifood sector in the four countries.

TABLE 10a
Logistics strengths in the four countries

		Country	Strengths*
Strength	All countries		• Government initiatives implemented effectively, boosting the logistics performances of agrifood firms • Firms investing in modern machinery and ICT tools • Overall understanding that poor logistics systems affect the performance of agrifood firms
Strength	Specific to each country	Cameroon	• Computer-literate and bilingual (French and English) staff • National communications and Internet network covering most regional offices • High diversity of products • Large firms with good machinery, packaging systems and laboratory equipment • On-farm supervision of raw material production for quality improvement • Use of mobile phones by all companies
Strength	Specific to each country	Ghana	• High awareness of customer care/building relationships with clients • Efficient planning of logistics by large firms • Branding by medium-sized and large firms • Large firms with pre-processing activities close to raw material sources • Large firms with logistics departments and good logistics systems • Better fleet management in medium-sized and large firms • Farms applying good agricultural practices such as environmental hygiene principles • Most firms (90%) with technological systems • Good communications and relationships with customers
Strength	Specific to each country	Uganda	• Good technological standards applied (e.g. HACCP, International Organization for Standardization, GMP, etc.) • Investment authority linking small and medium-sized firms to sources of finance and providing training on management and operational skills • Good performance (up to 100%) in fulfilling customers' orders • 50–75% of investigated small and medium-sized firms employing advanced ICT
Strength	Specific to each country	United Republic of Tanzania	• Large population engaged in agrifood production. • Large firms with separate logistics management departments, good staff expertise and good perceptions of logistics • Large farms with good customer care and order management • Better personnel training than in non-agrifood firms • Wide use of mobile phones for communications • Increasing numbers of telecommunication operators providing mobile phone services

* The strengths, weaknesses, opportunities and threats listed were reported by at least one firm but not necessarily all the firms in the country.

TABLE 10b
Logistics weaknesses in the four countries

Country			Weaknesses*
Weakness	All countries		• Limited understanding of logistics systems and management • Lack of new machinery and equipment • Lack of access to financing • Lack of warehousing facilities and packaging materials • Shortages of raw materials • Lack of standby power and water supplies • Inadequate and inefficient information services • Lack of training
	Specific to each country	Cameroon	• Inadequately trained technicians • Limited use of ICT • Weak networks or unions • Poor decision-making processes • Unreliable processing equipment, vehicles and sales agents • Problems with networking among agrifood enterprises
		Ghana	• Inadequate processing equipment in terms of both availability and performance • Lack of access to modern processing technologies and equipment, particularly for small firms • Lack of information, particularly about prices and market opportunities
		Uganda	• Lower logistics performance than in neighbouring countries • Poor infrastructure and logistics competence • Significant quantities of products rejected or discarded because of quality problems • Inefficient manual processes at firms because of poor maintenance services and unreliable power supply
		United Republic of Tanzania	• Underdeveloped infrastructure leading to poor, unreliable and expensive service delivery • Lack of financial instruments serving small and medium-sized firms • Weaknesses in the implementation of policies for improving logistics • Lack of adequately skilled personnel • Weak policies and enforcement structures • Small scale of production • Limited adoption of advanced technologies • Only few large firms with short-, medium- and long-term planning of logistics • Generally unimpressive logistics management systems

* The strengths, weaknesses, opportunities and threats listed were reported by at least one firm but not necessarily all the firms in the country.

TABLE 10c
Opportunities for improving logistics

Country			Opportunities*
Opportunities	All countries		• Availability of some processing technologies and experience • Availability of labour • High demand for quality products • Government policies supporting the agrifood sector by promoting infrastructure development, training and investment in small and medium-sized firms
	Specific to each country	Cameroon	• Increasing domestic production of raw materials • Expanding road network • Increasing free trade in the region of the Central African Economic and Monetary Community (CEMAC) • Availability of seaport with improving maritime transportation system • Improving telecommunication network/access to ICTs
		Ghana	• Export opportunities via seaports • Free zone opportunities and other presidential initiatives • Possibility of outsourcing some logistics needs • Availability of institutions for quality assurance and safety management
		Uganda	• Awareness of the importance of partnerships with other actors in the supply chain • Managers with fair knowledge of the importance of logistics for their firms' performance • Good factory layouts and space for future expansion • Skilled drivers and good maintenance services
		United Republic of Tanzania	• Availability of seaports and presence of landlocked neighbours • Growing urbanization increasing demand for agrifood products • Abundant fertile arable land and water available for agricultural production • Abundant animal stocks for dairy and meat production, with the country ranking third in Africa for livestock numbers • Decreasing ICT costs

* The strengths, weaknesses, opportunities and threats listed were reported by at least one firm but not necessarily all the firms in the country.

TABLE 10d
Threats to logistics development

Country			Threats*
Threats	All countries		• Poor road networks, especially in rural areas • Policy inconsistencies and government bureaucracy • Shortages of infrastructure such as power and water supplies • High logistics costs and fluctuating and high fuel costs • Effects of climate change on agricultural productivity • Seasonal variability in raw material supplies
	Specific to each country	Cameroon	• Multiple taxes, levies and corruption, creating financial constraints • Space limitations for small and medium-sized firms, hindering their expansion • Challenges in satisfying international quality standards for firms exporting their products • Challenges with product traceability for firms exporting their products
		Ghana	• High interest rates on loans and unwillingness of financial institution to lend to the agriculture sector • Agrifood firms unwilling to participate in research because of disappointing results from past studies • Heavy traffic approaching airports and risk of vessel delays • High costs of packaging materials • Multiple taxes and levies • Stiff competition from global competitors • Shipping fleet challenged by export requirements
		Uganda	• High production costs for locally produced products • Challenges with business environment and attraction of investiments
		United Republic of Tanzania	• Weak enforcement of standards such as good agricultural practice and GMP • High operating costs because of poor logistics systems in small and medium-sized firms • Constraints in transport and storage services • Financial constraints

* The strengths, weaknesses, opportunities and threats listed were reported by at least one firm but not necessarily all the firms in the country.

Agriculture is the mainstay of the economies of the four countries appraised, making the agrifood industry one of the main economic movers. Improved logistics management and systems will help these countries to unleash their potential in the agrifood sector and address some of the weaknesses reported in the country studies; improvements in the processing and other value addition stages will stimulate the production of raw materials; and increased production will spur competition among producers, encouraging enhancement of product quality. Firms producing at lower costs because of better logistics management will be more competitive, while more efficient and increased production will stimulate investments in utilities and related services by the private sector, boosting governments' efforts in these sectors. The strengths in and opportunities for improving logistics management and systems therefore seem to outweigh the threats and weaknesses.

Chapter 6
Conclusions and recommendations

6.1 MAJOR LESSONS LEARNED FROM THE APPRAISAL STUDIES

The overall efficiency of the firms studied depended on the performance of their logistics systems. These systems were generally unsatisfactory at small agrifood firms, while medium-sized and large firms had better logistics. Annex 1 summarizes the main lessons learned from each country.

In general, lack of adequate infrastructure (external factors), facilities at firms and effective logistics management (internal factors) led to: i) reduced productivity for the firms; ii) product losses in both quantity and quality; iii) increased costs; iv) lower customer satisfaction; v) declines in firms' overall performance; vi) reduced competitiveness for the firms; and vii) failure to contribute to poverty reduction.

It is important to note that different types of logistics facilities are required at different points in the value chain. For example, agrifood firms dealing with perishable products such as fruit, vegetables, milk, tea and sugar, fish and seafood could benefit best from investments in transport and storage with cold chain facilities. Firms dealing with cereals and oilseeds or other dry products could benefit more from investing in in-house facilities such as processing equipment, quality control equipment, packaging materials and labelling machinery.

Following the appraisal studies, a regional workshop on "Logistics Systems and Management in Agrifood Industries in Africa" was held in Kampala, Uganda on 27-28 November 2012. The Uganda Industrial Research Institute (UIRI), a government institution under the Ministry of Trade, Industry and Cooperatives, organized the workshop on behalf of FAO. The 20 participants included FAO staff, the national consultants who conducted appraisals, government officials from agriculture ministries in selected African countries, private-sector and other development partners. Participating countries were Cameroon, Ghana, Kenya, South Africa, Sweden, Uganda and the United Republic of Tanzania. International organizations such as the United States Agency for International Development (USAID) and the World Food Programme were also invited. Deliberations from the workshop are summarized in Annex 2 of this report.

6.2 CRITICAL AREAS REQUIRING IMMEDIATE ATTENTION

Policy implementation: All four countries had policies that focused on boosting the agrifood sector and addressing the logistics issues facing agrifood firms. Some of these policies were implemented successfully, while others failed. Immediate action is required to revise and enforce the implementation strategies for these logistics-related policies.

Infrastructure improvement: Poor logistics systems and management combined with poor infrastructure greatly hindered the performance and growth of agrifood industries. Improving rural roads, electricity and water supplies and telecommunication services is essential for existing agrifood firms and for new firms entering the sector. Small and medium-sized firms in particular need to replace obsolete facilities with new, improved facilities, taking into consideration the availability of spare parts and maintenance services.

Cold chain: The findings indicated that 53 percent of the firms processed perishable products, varying from fresh fruits and vegetables to food services. Effective logistics management and systems – such as cold chain facilities – are crucial for these firms to improve their performance and reduce product losses.

Networking: Strong linkages among producers, processors, markets and financial institutions help to reduce post-harvest losses. Reinforcing the links between agrifood firms and research institutions plays a significant role in reducing post-harvest losses and improving product quality.

Training: The four appraisal studies found that the managers and other personnel in charge of logistics activities at firms generally lacked a full understanding of logistics systems and management. Most managers viewed logistics as relating only to infrastructure (such as buildings and equipment) and transport services. Logistics was better understood and logistics systems and management were better organized at large agrifood firms, followed by medium-sized firms. However, all the managers interviewed understood that lack of appropriate logistics facilities and infrastructure greatly hindered their firms' growth. In general, logistics personnel require training in up-to-date logistics systems and management.

Information flow: Only basic ICT services such as mobile phones, Internet access, wireless connections, telephone/fax, e-mail and bar coding were widely utilized in the agrifood firms. Lack of modern technology and ICT systems was one of the main logistics challenges identified in the reports. Efforts are needed to build agrifood firms' capacity to use computer programs for order management and inventory control and ICT systems for product tracking, and to ensure reliable connectivity for communicating information.

Financial support: Lack of access to finance was a major challenge for small and medium-sized agrifood firms. Microfinancial institutions are very important in tackling this challenge, but there is a need to enhance the financial and management capacity of existing institutions and establish new ones. To reduce the financial burden on agrifood firms, government bureaucracy, multiple taxes and corruption need to be tackled immediately. Medium-sized and large firms also require access to financial sources and infrastructure support to facilitate their investments in logistics systems and increase their production capacity by expanding existing facilities and acquiring new ones.

6.3 RECOMMENDATIONS

The appraisal studies did not cover all regions of the investigated countries, so integrated and in-depth studies focusing on both policy and infrastructure issues are essential. Gaps in logistics systems should be identified and appropriate solutions designed to promote sustainable development in the agrifood sector. Future studies should include detailed investigation of the role of logistics in both successful and unsuccessful agrifood firms to establish best practices and lessons for use in the future.

Specific recommendations for governments and firms are provided in the following subsections.

Recommendations for government

Policy issues: Challenges such as weak policies and enforcement structures, policy inconsistencies, government bureaucracy, low government capacity to implement policies, lack of enabling environment and lack of timely policy reviews were identified. Corrective measures for facilitating the implementation of existing and new policies include the following:

- Encourage implementation of existing and new policies, based on studies and knowledge of the logistics systems of agrifood firms.
- Ensure political willingness and good governance to eliminate or reduce the problems such as policy inconsistency and bureaucracy that are associated with the logistics-related services provided by government agencies.
- Provide training and capacity building on policy development and implementation of strategies.

Infrastructure: The study findings indicated that the logistics performance of agrifood firms is hampered by inadequate and inefficient infrastructure. Infrastructure to support logistics is often lacking, and where it is present, it is inadequately maintained. Tackling infrastructure challenges should be a priority for all four governments; the following actions are recommended:

- Improve external infrastructure such as roads, railways, sea- and airports, power and water supplies, and telecommunication networks.
- Ensure consistent maintenance of existing infrastructure.
- Encourage efficient utilization of infrastructure and facilities, including efficient energy utilization.
- Encourage the development of alternative power sources, such as solar energy, wind energy, small-scale hydropower and geothermal energy schemes.
- Encourage investments in standby generators and water reservoirs.

Financial support: The appraisals noted that financial constraints affected the development of agrifood firms, especially small and medium-sized ones. The following recommendations for government aim to reduce the financial burden on and strengthen the production capacity and efficiency of agrifood industry firms:

- Encourage the formation of microfinance institutions.

- Reduce multiple taxes and interest rates.
- Facilitate loans for agrifood firms.
- Encourage investments in logistics systems at the national level.

Support to networking and coordination: Strong links should be created among agrifood processing companies and research and financial institutions to improve overall performance of the agrifood chain. Governments should facilitate the creation of strong and well integrated networks, and should supervise them continuously to ensure their effectiveness and address any problems or challenges that arise. The following are recommended actions in this area:

- Encourage the creation of linkages among agrifood firms, research institutions and financial institutions and strengthen existing linkages.
- Encourage firms to establish relationships with local farmers.
- Establish private–public partnership for effective management of warehousing systems.

Establishment of regional centres of excellence for logistics: Despite government policies encouraging development of the agrifood sector – particularly small and medium-sized firms – improvements have not been easy because of logistics constraints such as lack of technology appropriate to local needs, existing skills in the labour force, size of operations, energy availability, infrastructure, facilities, and knowledge of logistics. Effective implementation of policies is needed to support the development of technical capacity and the design of efficient logistics systems and management. A centre of excellence dedicated to providing education and training on logistics systems and management for the agrifood sector would be a good solution to these challenges. Specifically, the centre of excellence could serve as a knowledge bank to support the following actions:

- Provide training to improve the knowledge of firms' managers concerning the concept and importance of logistics systems and management.
- Provide short-term courses and organize workshops on logistics.
- Encourage the involvement of development partners such as FAO to support training courses.
- Facilitate well-organized online training programmes for agrifood firms on the acquisition of appropriate and modern logistics facilities, and provide knowledge for non-agrifood firms.

The centre could be established through existing regional bodies such as EAC and ECOWAS.

Recommendations for the firm level

Outsourcing of logistics services: Agrifood firms in the four countries used outsourced services mainly for transporting raw materials and processed products. In some cases, outsourcing faced constraints such as a lack of appropriate vehicles available in the required quantity and at the required time and place. Firms and governments are therefore recommended to carry out the following actions:

- Encourage third-party logistics service providers to study the needs of agrifood firms in their areas and plan appropriate services.
- Form linkages between third-party logistics service providers and agrifood firms to facilitate coordinated provision of logistics services. For example, when two or more agrifood firms in the same area need to transport small quantities of goods, they can use the same provider of logistics services.
- Encourage firms to outsource the supply of raw materials and the distribution of products when appropriate.

Transport services: The quality of transport services is highly dependent on the status of roads, railways, airports and seaports. At the firm level, transport services are affected by the firm's capacity to invest in appropriate vehicles, maintenance services and personnel skilled in fleet management. Poor transport services can cause significant economic losses, particularly for firms dealing with perishable products such as fruits and vegetables. To tackle these transport-related challenges firms are recommended to do the following:

- Invest in appropriate vehicles and ensure regular maintenance services.
- Adjust the timing of deliveries to avoid delays during periods of traffic congestion.
- Improve (optimize) fleet management for effective transportation.
- Synchronize the inflow of raw materials with the firm's processing rate and/or capacity and with the outflow of processed goods.
- Plan acquisitions of raw materials taking seasonal variation into consideration.
- Base the site selection of new firms on the actual or potential availability of local raw materials of sufficient quality and quantity.

Facilities: Acquiring and maintaining facilities at the firm level are important actions for ensuring consistent production and reliable deliveries of quality products. Erratic power and water supplies can cause interruptions in production processes, and unreliable connectivity for ICT can hamper deliveries. The following are actions for reducing these problems:

- Invest in standby generators and water reservoirs.
- Invest in appropriate warehouse and storage systems.
- Invest in a cold chain.
- Establish cold storage facilities close to production, particularly for fruits and vegetables.

ICT systems: Modern ICT systems are valuable tools in reducing poverty through development of the agrifood industry sector. If harnessed properly, these technologies can increase productivity, facilitate marketing and product traceability, and increase the performance of agrifood firms. Decreasing ICT costs and increasing capabilities in ICTs provide opportunities for increasing the use of ICTs. It is therefore important that firms do the following:

- Large firms should invest in advanced ICT systems.
- Small and medium-sized firms should seek financial and technical assistance with obtaining access to improved ICT systems.

Improving competitiveness: Modern food systems are becoming global, but the knowledge and capital they need to function as part of the global food system are beyond the reach of most local smallholder farmers. In addition, the costs incurred by inefficient logistics systems and management compromise the competitiveness of local agrifood products in both domestic and international markets, with imported products sometimes being cheaper than products from local firms. It is therefore essential that firms do the following:

- Improve product quality and safety.
- Improve their access to market information systems.
- Take action to reduce logistics costs.
- Establish good relationships with business partners to improve logistics performance.
- Ensure timely delivery of products and customer satisfaction.
- Implement appropriate product traceability systems.

Specific training: The appraisal studies noted the importance of training. Efficient use and maintenance of ICT facilities and other equipment, inventory control and documentation all require technical skills, and personnel require training, especially in new technologies. Managers of agrifood firms should therefore arrange appropriate training for their staff:

- Supply agents require training in the preprocessing of raw materials to reduce the weights and costs and improve the quality of raw materials.
- Operation managers and technicians require training on how to use ICT to address logistics challenges.
- Staff involved in exporting products require training in relevant logistics issues.
- Drivers require training on advance driving skills, vehicle maintenance and issues related to agrifood logistics such as animal welfare, the importance of the cold chain (especially when transporting perishable food products) and environmental issues.

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Annex 1

Summary of major lessons learned from the appraisal studies

Country	Lessons*
All countries	• Overall logistics performance (and perceptions of logistics) is best in large agrifood firms, good in medium-sized firms and poor in small firms • Effective implementation of logistics-related policies is important • The availability of infrastructure attracts manufacturing firms to major cities • Transport services should sometimes be outsourced • Planned and targeted training is required for managers and employees (e.g. drivers, ICT technicians) • Effective information flow enhances logistics management • Reliable supply of raw materials is important • Appropriate site selection and plant design are vital for enabling future expansion • Perishable produce requires more effective and efficient logistics systems
Cameroon	• Create pilot centres to demonstrate agrifood processing such as milk processing and juice production • Recruit bilingual workers • Source packaging materials from local producers • Inappropriate labelling facilities impede the logistics managements of small firms • Local farmers are the main partners supporting small firms • Frequent meetings between managers and employees help to improve firms' performance • Quality control problems affect performance in export activities • The demand for agrifood products is always greater than the supply • To be competitive, coordination is important for firms exporting their produce • Firms should incorporate logistics aspects into the early stages of their planning • Problems with customer satisfaction should be solved rapidly, with clients' suggestions used to inform improvements • The government's growth and poverty reduction strategy has boosted the performance of all firms – small, medium-sized and large • Traceability is very important
Ghana	• Good policy and strategies are very important • Microfinance institutions are effective in enhancing the capacities of small and medium-sized firms • More than 50% of customers are local • Effective planning of logistics is essential • It is important to pre-process some raw materials close to their sources • Vehicles must be washed and disinfected regularly • Effective inspection and supervision of outsourced raw materials is important for quality assurance • Suppliers should be trained in pre-processing raw materials • Some large firms use the maintenance services of shipping companies • It is important to maintain the right temperature and moisture content for finished products • There is need for better use of technology and ICT systems, such as specialized software, online tracking, electronic data exchange and GPS • The quality of a product starts with the quality of the raw materials
Uganda	• There are many logistics challenges at the firm level • Use of basic and advanced ICT could boost firms' capacity in generating and projecting profit margins, handling online orders, managing payments, establishing links to partners, and advertising their products • Investing in good standard systems (e.g. HACCP) is important • Linking small and medium-sized firms to financial institutions is important • Adopting supply chain management principles can reduce inefficiencies and increase competitiveness • Firms producing raw materials locally and controlling the quality of products can fulfil up to 100% of customers' orders • Product promotion can be too expensive for small and medium-sized agrifood firms

Country	Lessons*
United Republic of Tanzania	• At the national level, infrastructure should be improved and the opportunities provided by the country's seaport should be used to boost business relationships with neighbouring landlocked countries • Appropriate storage for perishable produce and protection against rodents and insects for grains are required • Small firms focus on supplying non-perishable produce because perishable fresh produce requires high capital investments in costly logistics systems to ensure product safety • Agrifood firms dealing with dairy and fresh produce face greater challenges than cereal and oilseed firms • Marketing and logistics management problems are more pronounced in smaller firms • Small firms give less attention to logistics for production • Outsourcing of logistics services is cost-effective for small firms

* The points listed were reported by at least one firm but not necessarily all the firms in the country.

Annex 2
Expert workshop on logistics systems and management

LESSONS FROM THE COUNTRY STUDIES

The FAO workshop on logistics management in agrifood industries took place on 27 and 28 November 2012 at the Uganda Industrial Research Institute (UIRI) in Kampala, Uganda. The participants discussed the implications of findings from the appraisal studies and highlighted the main lessons. One observation made in all four studies is that overall logistics performance (and perceptions) is best at large agrifood firms, good in medium-sized ones and poor in small firms. This implies that capacity building in logistics systems and management is an important aspect for small and medium-sized agrifood industries in Africa. The following aspects were also found to require urgent attention for improving logistics systems and management in Africa:

- effective implementation of policy issues;
- reduction of multiple taxes and policy inconsistencies, as major constraints;
- outsourcing of logistics services such as transport;
- training on logistics issues for managers and employees;
- effective information flow to enhance logistics management;
- reliable supplies of raw material;
- appropriate site selection and plant design, which are vital for future expansion of firms;
- more effective and efficient logistics systems, including cold chains for perishable produce.

The following are the critical areas identified by experts as requiring immediate attention:

- *Policy implementation:* Some policies addressing logistics – those on the development of small and medium-sized enterprises, energy, trade, transportation, etc. – need further review and well-designed strategies to ensure their smooth implementation.
- *Infrastructure improvement:* More investment in rural roads – especially feeder roads from farms – power, water and telecommunication infrastructure is essential.
- *Cold chain:* About half of the 93 agrifood firms deal with perishable products, making investments in cold chains essential.
- *Networking:* Post-harvest losses (in terms of quantity, quality and safety) are significant. Cooperation with other partners and research institutions is required to address them.
- *Training:* Training is needed to increase firms' awareness of the importance of logistics and to fill the gaps in logistics skills.
- *Information flow:* Use of ICT and improvement of telecommunications connectivity require more attention.
- *Financial support:* There is need to increase access to sources of financing, strengthen financial institutions and reduce the financial burden of bureaucracy, multiple taxes and corruption.

ESSENTIAL LOGISTICS COMPONENTS FOR AGRIFOOD FIRMS

Experts at the workshop discussed the components of logistic systems, focusing on the situation in their own countries and regions and identifying priority areas requiring improvement. The experts' ranking of these areas is shown in the following table.

Ranking of logistics elements requiring attention

Rank	Logistics component
1.	Transportation of goods, and associated services
2.	Site selection for new agrifood firms; firms located close to the sources of raw materials, markets, power supply, roads, water, etc. are more likely to succeed
3.	Warehousing and storage
4.	Handling of goods and materials along the food supply chain, including the cold chain
5.	Customer services
6.	Inventory management
7.	Demand forecasting
8.	Procurement
9.	Packaging

STRATEGIES FOR IMPROVING LOGISTICS

The experts identified strategies for improving logistics systems and management in Africa. These strategies are directed to three main groups of stakeholders: development partners; African governments; and private-sector entrepreneurs:

i. *Strategies for development partners:*
   - Infrastructure and finance: support projects/programmes such as that of USAID in Ghana.
   - Knowledge: support training at various levels.
   - Policy: support the establishment of extension services in logistics for agrifood firms.
   - Establish preconditions for funding projects to promote logistics activities.

ii. *Strategies for governments:*
   - Infrastructure and finance:
     - minimize taxes and non-tax barriers;
     - improve credit systems for the agrifood industry;
     - improve infrastructure such as roads, railways and ports.
   - Knowledge:
     - support training and capacity building on logistics at various levels.
   - Policy:
     - establish extension services in logistics for agrifood firms, to support policy implementation and education in logistics;
     - explore avenues for creating logistics platforms involving public, private (agrifood firms), academic and other stakeholders in addressing logistics challenges.
   - Develop new strategies that promote logistic performance in the agrifood industry.

iii. *Strategies for private-sector entrepreneurs:*
   - Initiate projects based on demand from agrifood firms.
   - Organize training at different levels.
   - Participate in the logistics platforms established by government.

Workshop participants then discussed the essential roles of each of these groups of stakeholders in improving logistics and logistics management in the agrifood industry. The outcomes of these discussions are shown in the following tables.

Roles in closing the logistics knowledge gap

Timeframe	Government	Private sector	Development partners
Short-term	Create a platform for knowledge sharing	Share knowledge with others	Provide technical assistance and advice
Medium-term	Ensure sustainability of the platform Review relevant policies	Share experiences	Provide technical assistance and advice
Long-term	Monitoring and evaluation, by research and knowledge-based institutions	Create specialized value chain fora Implement policies	Provide support

Roles in improving the infrastructure

Timeframe	Government	Private sector	Development partners
Short-term	Improve existing infrastructure	Share experiences on major logistics challenges related to infrastructure	Provide technical cooperation and support
Medium- and long-term	Provide and expand infrastructure – ICT, transport, utilities Provide incentives for private investment	Invest in infrastructure	Provide technical cooperation and support

Roles in developing logistics policy

Timeframe	Government	Private sector	Development partners
Short-term	Lead the process of developing logistics-related policies in consultation with all stakeholders	Provide inputs for policy development	Provide technical cooperation and support
Medium-term	Review policy in line with emerging issues	Provide inputs for policy review	Provide technical cooperation and support
Long-term	Conduct continuous evaluation and monitoring of policy implementation	Participate in policy evaluation and monitoring	Provide technical cooperation and support

THE MAIN OUTCOME OF THE WORKSHOP

The workshop provided an opportunity for participants to discuss and validate the appraisal findings and reflect on the synthesis of the four reports. Participants provided essential inputs towards the development of guidance and recommendations for policy-makers, the private sector, development partners and other stakeholders in African countries. These discussions and recommendations are vital to the enhancement of logistics management in agrifood industries in sub-Saharan Africa as a way of promoting competitiveness. The sharing of experiences and networking that took place among participants during the workshop helped to increase understanding of the need to address both the challenges and the opportunities related to logistics and logistics management in the agrifood industry in a sustainable way that is suitable to the country concerned.

Firm-level logistics systems for the agrifood sector in sub-Saharan Africa

Report based on appraisals in Cameroon, Ghana, Uganda and the United Republic of Tanzania

This publication is based on four FAO-commissioned studies which were carried out in Cameroon, Ghana, Uganda and the United Republic of Tanzania to review logistics in the agrifood sector. External and internal factors affecting logistics efficiency in agrifood firms are explained. The publication also provides recommendations for governments and businesses which include improvement of policies, infrastructure and transport facilities, use of ICT, services outsourcing and staff training on logistics.

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