Support for small-scale food processors in developing countries in a changing global food supply

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Changes in world food supplies over the last 30 years are having a profound effect on small-scale processors in developing countries, marginalizing some and providing new opportunities for others. This paper examines the trends that are taking place, opportunities for small-scale food processors and the constraints that restrict their development. The paper recommends improvements to support provided by educational and research institutes in developing countries and the establishment of a new supply service to overcome constraints in the supply of specialist equipment, packaging materials and ingredients.

Keywords: small-scale food processing, constraints, globalization, GVCs, education, equipment supply

GLOBALIZATION OF FOOD SUPPLIES has taken place since the 1980s following a series of international agreements to deregulate national economies, remove tariff and non-tariff barriers and create open markets in trade, foreign investment and finance. The Uruguay Round of the General Agreement on Tariffs and Trade (GATT) expanded the principle of free trade in key areas so that countries must reduce subsidies paid to agricultural producers and also reduce tariffs on imported goods used in food processing. Changes introduced by the International Monetary Fund and World Bank opened up opportunities for foreign direct investment (FDI) in food production, manufacturing and retailing by transnational food companies (TNCs). Much of the research into the effects of these changes has focused on the effects of FDI and operations by TNCs in the fresh food sector, but these changes have also had a profound effect on small- and medium-scale food processing enterprises (SMEs).

Globalization has had a profound effect on small- and medium-scale food processing enterprises

Some of the most important effects are due to the investment by multinational food processors and supermarkets. The intense competition between supermarket chains in Europe, USA and Japan,

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Intense competition between supermarket chains has led to them expanding into developing countries

stagnating home markets, together with higher margins available from investing in developing markets, have each provided the incentive for supermarkets to undertake FDI in other regions (Reardon and Timmer, 2005). Retail chains in more affluent developing countries have also expanded into other countries: for example South African supermarket chains have invested in 13 other African countries as well as in India and the Philippines (Reardon et al., 2003; Weatherspoon and Reardon, 2003). In addition to expanding retail outlets, supermarkets have used the revolution in logistics and computerized inventory management technologies via the internet to control and coordinate suppliers from countries worldwide through the development of global value chains (GVCs). The resulting economies reduced costs and in turn fuelled profits for further expansion. For example, in 2002 six global retailers (British Tesco, French Carrefour and Casino, Dutch Ahold and Makro, and Belgian Food Lion) spent US$120 m in Thailand; Walmart spent $660 m in the same year in Mexico to build new stores (Reardon et al., 2003); and in 2010 Walmart offered $4.6 bn to acquire South Africa's Massmart Holdings (Ausick, 2010). Indicators of the expansion into foreign markets are shown in Table 1.

Increased buying power by these large food retailers enabled them to drive down prices paid to their suppliers, and as their demand for product differentiation, just-in-time and year-round supplies increased, food processing companies responded with a series of joint ventures, partnerships, mergers and acquisitions among themselves or with food manufacturers in other countries to match the power of the retail sector. An indication of the growth of mergers and acquisitions is shown in Table 2 for all types of TNC.

Table 1. Expansion of TNCs into other countries

Company	*Number of countries operational*		*Foreign assets in 2006*		*Foreign sales in 2006*	
	1980	*2001*	*($ bn)*	*% of total assets*	*($ bn)*	*% of total sales*
Ahold (Netherlands)	2	27	–	–	–	–
Carrefour (France)	4	32	–	–	–	–
Metro (Germany)	7	26	23	55	41	55
Procter & Gamble (UK)	–	–	64	46	44	58
Tesco (UK)	2	9	–	–	–	–
Unilever (Netherlands)	–	–	34	70	45	92
Walmart (USA)	1	8	110	73	77	22

Source: adapted from UNCTAD (2008a) and Vorley (2003)

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Table 2. Annual average transnational mergers and acquisitions (M&As) with value of more than $1 bn

Period	*Number of M&As*	*Value ($ bn)*
1987–1996	29	60.7
1997–1999	107	377.8
2000–2004	128	438.2
2005	182	564.4
2006	215	711.2
2007	300	1,161

Source: adapted from UNCTAD, 2008a

30 companies now produce a third of the world's processed food

As a result, 30 companies produce a third of the world's processed food; five companies control 75 per cent of the international grain trade; two companies have half the world's banana sales and three companies trade 85 per cent of the world's tea (Action Aid, 2005). This consolidation created new horizontally and vertically integrated networks in order to remain competitive: horizontal integration between competing ingredient manufacturers and processors and vertical integration through diversifying into other stages of the value chain.

Leading firms in GVCs developed greater economic power to control the entire value chain and using advances in information and communication technology and supply chain management, now decide what will be produced, how, when, where and by whom (Memedovic and Shepherd, 2008; Memedovic, 2008). This was assisted by developments in microelectronics technology that allowed automation of food processes and reduced the need for highly skilled, highly paid workforces. This made it possible for food companies to use FDI to move their operations to new countries, often in the developing world, where unskilled and lower paid workers could be employed. As a result they have gained competitive advantages through sourcing raw materials from suppliers in different parts of the world to achieve the most competitive prices; to control raw material quality; to produce year round; and to avoid excess production capacity during seasonal fluctuations. The resulting advantages are economies of scale, a presence in as many markets as possible to exploit the benefits of global branding, and limiting vulnerability to market fluctuations (Memedovic and Shepherd, 2008).

From the 1990s joint ventures with indigenous companies have been used to process local raw materials

Initially, factories in developing countries produced foods using imported raw materials, ingredients and packaging, but from the 1990s joint ventures with indigenous companies have been used to process local raw materials that are packed, labelled and exported under the TNC's brand names. These operations include a wide range of processing techniques to produce ingredients such as flour, starch and cooking oils, and final products, including canned and

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frozen foods, carbonated beverages and dairy products. The local companies are trained to apply total quality assurance techniques and have their own R&D procedures to produce high quality, innovative products (Filippaios et al., 2009). Globalization supporters argue that advantages to local subsidiaries include transfer of new technologies, technical or managerial training, and increased international trading opportunities (Kolodner, 1994; Kaditi and Swinnen, 2003). Hilary (1999) reports that TNCs generally treat their workers better than local firms and almost always pay higher wages. Critics believe that TNC outsourcing of production to developing countries takes advantage of cheaper labour and natural resources, less stringent environmental and employment legislation and regulation; and it has negative effects on the host country's domestic markets and the productivity and innovation of local food companies (Gereffi et al., 1994; Fitter and Kaplinsky 2002).

Whereas 10 years ago, the debate on the role of the food processing sector in developing countries was largely concerned with import substitution and the employment benefits that agro-industries could provide in rural areas, today it is more focused on how the sector can play a strategic role in the overall economic growth strategies of a country, particularly export-oriented growth. For example, in many low-income developing countries, food and drink industries make up 35–50 per cent of total manufacturing value added, rising to over 80 per cent in 17 of the 37 poorest African countries (Wilkinson, 2004). This leads to governments giving priority to development of exporting capacity for processed foods, either directly with local food companies or as part of GVCs with multinational processing companies or retailers. However, not all developing countries are recipients of investment by TNC food processors and retailers and the following section examines factors that TNCs take into account when deciding which countries to invest in. This is followed by an examination of the opportunities and challenges facing SMEs in countries that have received food processing FDI and in those where it is more limited.

In many developing countries, food and drink industries make up 35–50 per cent of total manufacturing value added

Opportunities for small-scale processors in medium- and high-income developing countries

Factors that influence the attractiveness of a country for investment and TNC processors' choices of where to locate their plants include: the size of local or regional domestic markets; ease of access to markets in industrialized countries; local consumer income levels and cultural practices; the available human and natural resources; and local regulatory systems. The most important considerations are the size of the domestic market, income levels and their distribution,

The most important consideration is the size of the domestic market

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and particularly the size of the middle class. These criteria differentiate developing countries into low-, medium/transforming- or high-income countries.

The size of the domestic market is influenced by trends in population growth and rural–urban migration. The largest population growth is expected to take place in developing countries, with the most rapid increases in Africa (doubling from 1,030 million people in 2010 to 2,084 million in 2050). In India the population may rise to 1,748 million people by 2050, overtaking China as the most populous country (World Population Bureau, 2010). Similarly, rates of urbanization are much higher in developing countries (Figure 1) and rural to urban migration is particularly significant for food processors and retailers: high rents and other living costs in urban areas often require both adults in a family to work and also reduce employment of house maids. Employment of urban middle class women increases the opportunity cost of their time, and also their requirement for part-prepared or convenience processed foods. More widespread domestic ownership of freezers and refrigerators has also increased weekly or monthly shopping at supermarkets, rather than daily sourcing of fresh ingredients in local markets.

Employment of urban middle class women increases their requirement for part-prepared foods

Generational differences have also led to changes in food consumption and demand, with a higher proportion of younger generations in urban areas consuming more processed foods, especially processed meats, fish, dairy products and snack- or street-foods, compared with older people who eat more unprocessed cereals, vegetables and fruits. Similar trends are found in many higher-income developing countries (Figure 2).

Younger people in urban areas tend to consume more processed foods

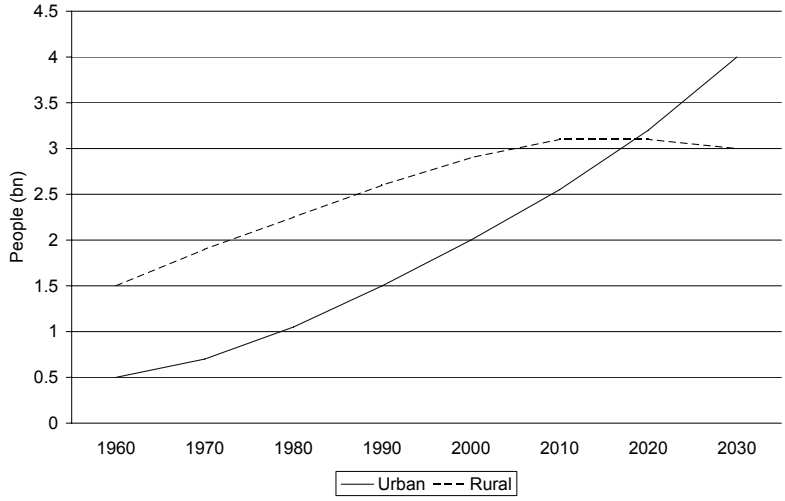

Figure 1. Urbanization in developing countries 1960–2030
Source: adapted from FAO (2004)

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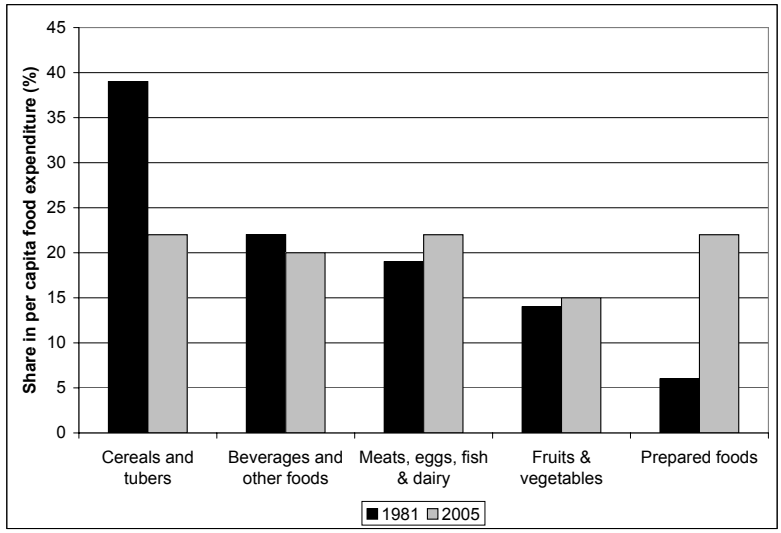

Figure 2. Food consumption expenditure in Indonesia is shifting from cereals to higher-value and prepared foods
Source: Baden Pusat Statistik, Indonesia

Higher-income urban residents also consume more of most foods on a per capita basis than lower-income rural populations.

In high-income developing countries, growth in demand for processed foods by the urban middle class has blurred the distinction between production for domestic and export markets. For example, Brazil is a major exporter of poultry products and soya oil, but in each case 70 per cent of total production is consumed domestically. Four countries (Argentina, Brazil, Malaysia and Thailand), along with Taiwan, produce 40 per cent of total processed food exports from developing countries (Wilkinson, 2004), with increasing participation by Chile, Indonesia, Turkey, Tunisia, Guatemala, El Salvador and Sri Lanka.

There is a large potential market for food processors and retailers in high-income developing countries

There is therefore a large potential market for food processors and retailers, which not only attracts food processing and retail investment but also offers opportunities for food processing SMEs. In countries where FDI has seen an expansion and development of food processing, the leading firms in GVCs often concentrate on brand promotion and competition strategy, and externalize other activities, including manufacturing and distribution, which opens opportunities for SMEs as suppliers (Louw et al., 2004). In earlier decades, this was confined to supply of ingredients and preparation, processing and packing of fresh produce, especially fish and horticulture products. The second generation of FDI has seen the growth

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of non-traditional processed foods for export, including highly processed snacks, convenience foods and soft drinks both for export and the domestic market. Smaller food processors can become part of the supply chain as sub-contractors or suppliers of part-processed ingredients. Leading firms may provide them with IT support, credit, technical assistance and supply management techniques to achieve the quality standards and levels of organization needed to integrate with these more demanding networks.

Grain milling, cooking oil and sugar extraction now offer limited opportunities for SMEs in some countries

However, TNCs often select larger-scale processors that can meet their requirements for scale and quality (Ribbink et al., 2005) and SMEs do not participate or gain the benefits arising from liberalized markets or FDI. Instead, their profitability and market share can be severely and adversely affected by higher competition from imported equivalent products (Memedovic and Shepherd, 2008). Some processes, including grain milling, cooking oil and sugar extraction, and in some countries dairy processing, that were previously operated at a small scale, have increased in scale and mechanization so that they now offer limited opportunities for SMEs (Dirven, 1999).

There may be opportunities for SMEs to focus on traditional products that offer high added value

There may be opportunities for SMEs to focus on traditional products that are not produced by larger companies but which offer opportunities for high added-value. This type of processing offers little competition to multinational food companies, and the products are often highly sought after by local people. The most important success factors for SMEs are to gain access to high-value markets that provide sufficient returns and financial incentives to all producers, distributors and retailers in the supply chain (Ribbink et al., 2005). The high added-value also enables smaller scales of operation that are an affordable investment by SME owners or shareholders. Other opportunities exist in areas of high-income developing countries that have widely dispersed communities in rural areas that are less attractive to the distribution systems of large-scale producers. Here local SMEs are more likely to be able to supply foods, especially short shelf life products such as baked or fried foods, meats or dairy products that require a short time and distance between production and consumption.

Local retailers are the main outlets for the products of SMEs and the recent and rapid expansion of supermarkets in high-income developing countries in Latin America, East/South-east Asia and Southern and Eastern Africa (Reardon et al., 2003) is both a challenge for food processing SMEs, but also offers great opportunities. In small supermarket chains, SMEs can sell products directly to store managers, but as the number of stores in a chain grows, procurement becomes centralized and warehouse distribution centres serve stores in a district, country or region. Here, supermarket procurement officers purchase for all retail stores in a chain and only deal with supply companies

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that are able to meet their quality specifications and volumes. They also prefer processors that are able to supply a diversity of products to reduce transaction costs (Reardon and Timmer, 2005). Retail chains also increasingly outsource logistics and wholesale distribution to new specialized wholesaler intermediaries that enforce quality standards and contracts on behalf of the supermarkets. This offers opportunities for SMEs that are able to upgrade their production and quality management to meet supermarket volumes and quality specifications, but it also results in processors being dropped from supplier lists if they fail to meet the required standards.

There are also numerous examples of food processing SMEs benefiting from GVC-type arrangements to supply fair trade organizations with products such as dried fruits, cocoa, coffee, rice, cooking oils, chocolate and honey. There are 11 organizations in the European Fair Trade Association (EFTA) and similar organizations exist in North America, Australia and other regions. They aim to build trading partnerships, based on dialogue, transparency and respect, which seek greater equity in international trade and, by offering better trading conditions, contribute to sustainable development and improved rights for producers and workers (EFTA website at www.european-fair-trade-association.org/ [accessed 17 March 2011]), as well as campaigning for changes in the rules and practice of conventional international trade. Global NGOs (e.g. Oxfam, Global Exchange and Greenpeace) have also organized successful social movements to promote diversified local production systems, which have been adopted by some leading retailers. The aim is to redirect some of the gains from globalization through GVCs to small-scale producers (Wilkinson, 2008). The differentiating factor of fair-traded products attracts consumers and constrains retailers to source these products from fair trade suppliers.

Global NGOs have organized successful social movements to promote diversified local production systems

In summary, SMEs in medium- and high-income developing countries have opportunities to supply: expanding domestic urban markets; specialist niche markets for foods that are not produced by TNCs; rural markets that large-scale processors do not wish to supply; and urban supermarkets; or as suppliers in GVCs for international supermarkets, fair trade organizations or TNC processors. To do this requires them to adopt improved production management, quality assurance and communications skills and facilities to meet the more stringent demands of these buyers.

Small-scale food processors in LDCs

In contrast to higher-income countries, in low-income developing countries (or least developed countries (LDCs)) the small domestic markets for processed foods are the main deterrent to attracting FDI.

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Investors doubt the value of installing a factory unless they can first achieve a 'critical mass' of local sales as a platform for later exports. Regional integration is perceived as a means of increasing sales in small national markets and TNCs may invest FDI in a country that is part of a regional group (e.g. the Andean Pact and Southern Cone Mercosul in Latin America, ASEAN in South East Asia, similar initiatives in Central America and the Caribbean, and the African regional groups shown in Table 3).

LDCs benefit little from regional trade agreements when they are the majority of the members

However, experience of regional trade agreements indicates that LDCs benefit little when they are the majority of the members, mainly because of similarities in their production and export structures (Shafaeddin, 2009). Also, where one or more countries in a regional group is a higher-income country, it tends to attract FDI at the expense of neighbouring LDCs. In addition to small markets, there are many other reasons for the lack of food processing investment in LDCs. These include: unsuitable national policy frameworks on privatization and corporate tax structures; weak enforcement of regulations; poor accounting standards and administrative bureaucracy; and high inflation rates – which each deter investors. In countries where other factors may be favourable to investment, the level of political instability and unrest can become a determinant, and a poor risk rating is a strong disincentive to investment (Figure 3). Poor infrastructure is also a major constraint; lack of all-weather roads, delays at ports or airports, unreliable communications, water and power

Table 3. Development of trade within regional groups in Africa

Regional group	*Value (US$ m)*			*Share in exports (%)*			*Average annual regional growth rate by value*	
	1980	*2000*	*2006*	*1980*	*2000*	*2006*	*1980–2000*	*2000–2006*
CEMAC	75	96	245	1.6	1.0	0.9	2.4	16.9
ECGLC	2	10	24	0.1	0.8	1.3	17.4	15.7
COMESA	569	1,443	3,489	1.8	4.6	4.2	9.7	15.8
ECCAS	89	191	334	1.4	1.1	0.6	7.9	9.7
ECOWAS	661	2,715	5,957	9.6	7.6	8.3	15.1	13.9
MRU	7	5	8	0.8	0.4	0.3	-3	8.1
SADC	106	4,383	8,571	0.4	9.4	9.1	45.1	11.8
UEMOA	460	741	1,545	9.6	13.1	13.1	4.8	13
UMA	109	1,094	2,400	0.3	2.3	2.0	25.9	14

Note: CEMAC, Economic and Monetary Community of Central Africa; ECGLC, The Economic Community of the Great Lakes Countries; COMESA, Common Market for Eastern and Southern Africa; ECCAS, Economic Community of Central African States; ECOWAS, Economic Community of West African States; MRU, Mano River Union; SADC, Southern African Development Community; UEMOA, West African Economic and Monetary Union; UMA, Arab Maghreb Union
Source: UNCTAD (2008b)

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supplies are all significant deterrents to investment. In some countries, government policy instruments actively promote and support SMEs, but many LDCs have inconsistent or antagonistic policies that undermine or hinder food processing development (e.g. taxation laws that are designed to maintain farm prices but encourage processing of unsaleable crops). Labour costs are also a significant determinant for investment, but if the cost varies little from country to country in a region, labour skill levels become important and the lack of trained technical staff in LDCs deters potential investors. In summary, for a majority of LDCs, poor governance, economic structural weaknesses, small markets, skills shortages and weak technological capabilities each depress prospective investments.

A lack of trained technical staff in LDCs deters potential investors

Lack of investment and increased competition from imports has had serious negative effects on small-scale food processors in LDCs. Most processors are involved in primary processing (e.g. cereal milling, cooking oil production; Table 4), and there is a lack of development of the secondary processing sector, which is heavily dominated by artisan processing and street sales. Typically, SMEs are

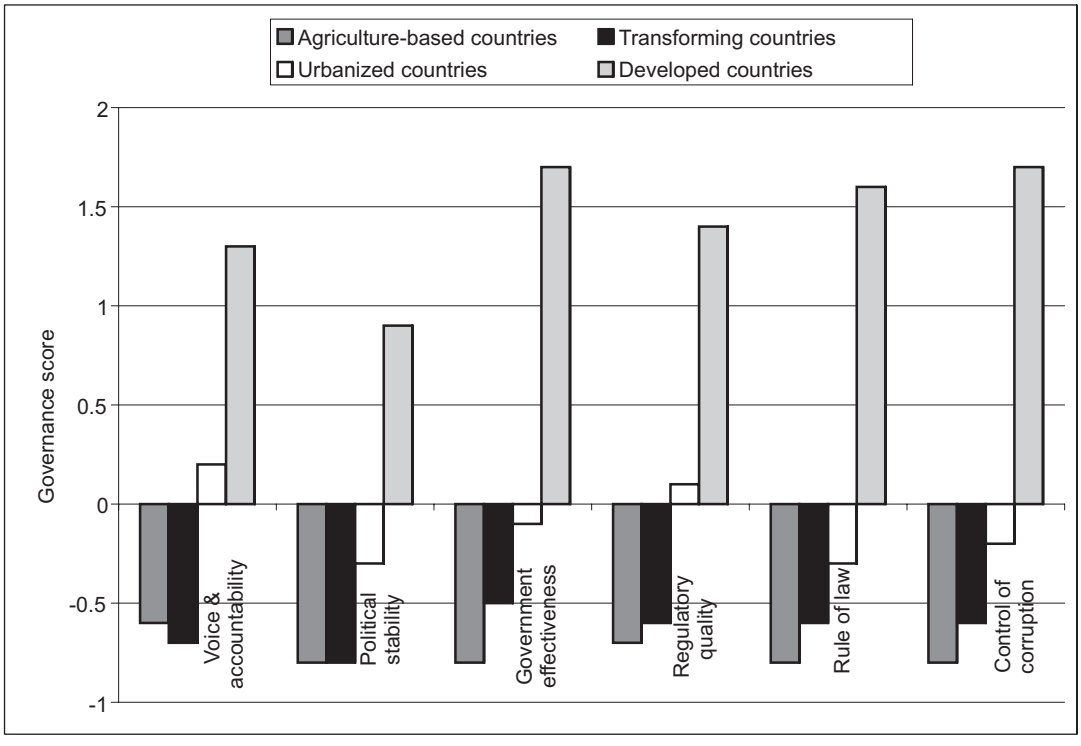

Figure 3. Governance scores for different types of country influence FDI decisions
Source: Kaufmann et al. (2006)

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Table 4. Food processing units in Pakistan

Type of processing	*Number of production units*	*Approx. processing capacity*	*Approx. numbers directly employed*
Cereals			
Rice husking/polishing	500	7 m tons/yr	20,000
Flour milling	470	25 m tons/yr	15,000
Bread/biscuits	46	46,830 tons/yr	10,000
Cereals	1	675 tons/day	250
Oils and sugar			
Edible oil	155	2.7 m tons/yr	12,000
Ghee/cooking oil	166	1 m tons/yr	20,000
Sugarcane milling	77	355,160 tons/day	10,000
Gur (brown sugar)	350	480,000 tons/yr	15,000
Horticulture crops			
Fruits & vegetables	25	45,000 tons/yr	15,000
Fruit juice	30	n/a	8500
Livestock products			
Seafood	26	50,000 m tons/yr	12,000
Meat	4	6,000 tons/yr	500
Poultry	1	800 birds/hour	1,000
Dairy	38	79.5 m litres/yr	15,000
Beverages	100	600 m litres/yr	n/a
Total	1989		154,250

Source: adapted from Competitiveness Support Fund (2007)
N/a = data not available

family-owned businesses that employ less than 50 to 100 workers and supply domestic consumers either directly or through local stores. Their processing is characterized by labour-intensive, manual batch operations, often using locally fabricated equipment, which results in relatively low productivity and efficiency. Quality assurance is often minimal, which together with low outputs, means they are not able to supply the volumes and quality requirements of supermarkets.

ISOs and traceability systems are increasingly used by governments as reference quality standards in domestic markets

SMEs may also be threatened in some countries by government efforts to implement new quality standards relating to food safety in handling and processing (ISO 9000/22000), environmental issues (ISO 14001), labour (SA 8000); use of energy and water, or recycling and re-use of materials (Humphrey and Memedovic, 2006). Private standards by retailers are also used as a basis for monitoring and certification of suppliers, using HACCP (hazard analysis critical control point) and traceability of products throughout the value chain. ISOs and traceability systems are increasingly used by governments as reference quality standards in domestic markets, and they are required

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for entry into international markets. This leads to exclusion of food processing SMEs that do not have the required level of technical knowledge, management skills or ICT infrastructure (Humphrey and Schmitz, 2008).

They are also damaged by any developments that reduce local demand for their processed foods, such as elimination of import tariffs. Where liberalization of markets has opened up competition from imported foods, their often higher quality and more attractive packaging have adversely affected the profitability and market share of SMEs. The uneven distribution of FDI and more generally deregulation and liberalization of food production have become the focus of considerable debate between globalization supporters and critics. Unfair competition against SMEs from imports is one of the main issues raised by critics of globalization: activists argue that TNCs need to be regulated because they negotiate lower prices and accumulate the resulting added value, thus draining wealth from already poor rural communities.

The new GATT clause was introduced to address the imbalance in trade that negatively affects developing countries

A coalition of international aid and development agencies has long been campaigning for fundamental changes to the international rules that govern trade between industrialized and developing countries to address these issues (Khor, 1996). Some (e.g. Christian Aid, 2005) are lobbying to redirect trade rules in favour of LDCs, such as changes to European Economic Partnership Agreements, removal of non-tariff barriers, investment in trading infrastructures and protection from imports, especially when the production costs of imports are subsidized (Figure 4) or when ingredients that are locally available are imported. In a partial response, the 'special and differential treatment' enabling clause of GATT for developing countries (Page, 2004) was introduced to address the imbalance in trade that negatively affects developing countries. Some TNCs have also developed corporate social responsibility policies to direct their dealings with suppliers from developing countries, including the Ethical Trading Initiative in the UK, a joint initiative of business, trade unions and non-governmental organizations.

Many of the problems facing food processing SMEs in LDCs are related to lack of skills or lack of knowledge and information, for example:

- Basic education levels, lack of training of workers and shortage of experienced and skilled technicians result in poor technical understanding of processing and quality assurance and lead to variations in product quality or inability to meet sanitary and quality standards. Lack of staff training in hygiene and other HACCP requirements may cause unacceptable food safety risks in some sub-sectors (especially dairy, meat and fish processing).

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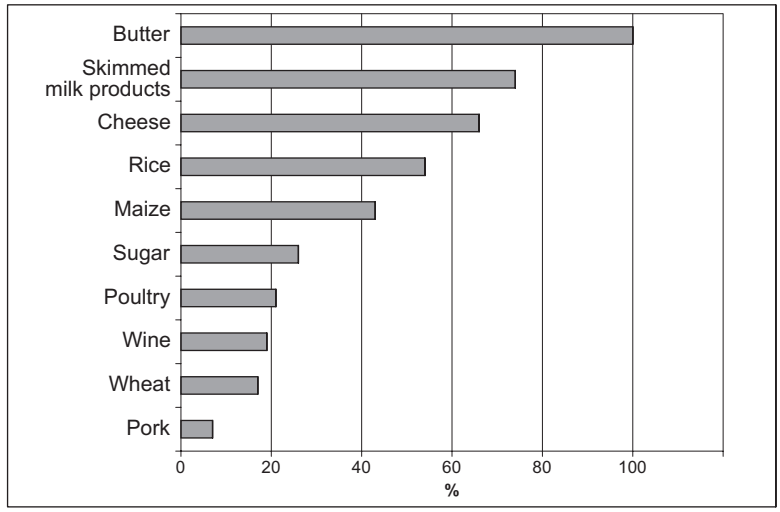

Figure 4. Subsidized exports as a percentage of total EU exports 1995–2001
Source: Jales (2004)

- Poor production planning and management skills result in failures to meet production targets. Lack of planning for equipment or power failures causes production stoppages and failure to deliver orders on time.
- Lack of packaging design skills and/or access to affordable attractive packaging materials, and lack of promotion and marketing skills each reduces product competitiveness.
- Poor financial planning and management skills leading to high unit production costs, incorrect product pricing, buying ingredients from local markets at high unit cost. A lack of control over cashflow and low levels of profitability that restrict investments in improvements, as well as inability to retain staff or compete with larger firms paying higher wages.
- Lack of contracts with farmers and other suppliers, which results in inadequate control of crop varieties that are suitable for processing, their quality, volumes or timeliness of deliveries.
- Restricted access to information on prices, consumer requirements, or alternative buyers, and poor negotiating skills, each reduce SMEs' bargaining power with buyers.
- Lack of knowledge of, or access to, affordable high-quality food processing equipment, specialist ingredients and packaging materials.
- Lack of access to/high cost of finance deters local SME investment.
- SMEs lack influence over government policies or access to support that is available to larger companies (e.g. tax-breaks, foreign exchange allowances etc.).

A lack of access to affordable packaging reduces product competitiveness

Restricted access to information on prices and consumer requirements reduce SMEs' bargaining power

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Support to address these deficiencies may be grouped into three areas: 1) skill development and provision of information; 2) provision of specialist equipment and materials; and 3) affordable finance, the last being beyond the scope of this paper.

Skill development and provision of information

Many of the constraints on food processing SME development in LDCs have long been recognized by international development agencies, bilateral aid and development programmes and UN organizations. In response, they have introduced technical training in production technologies, hygiene and quality assurance, and training in management, marketing, bookkeeping and financial management to achieve higher levels of entrepreneurial competency. There are also a large number of national support and development agencies in LDCs that are undertaking similar programmes. There has also been a steady increase in the amount and availability of affordable published information on food processing. For example, Practical Action offers a technical enquiry service for entrepreneurs and has free on-line 'Technical Briefs'. Other organizations, including CTA, FAO, GRET, UNIDO, IDRC, NRI, Practical Action and Agromisa (all 2011) have published information on production techniques, equipment and materials required for specific types of processing. Other methods of SME support that are being promoted by international development agencies and UN organizations include enterprise development centres that offer training and promote business linkages, the establishment of small-scale processor clusters or associations, such as the Tanzania Food Processors Association and the Uganda Small Scale Food Processors Association, both supported by UNIDO (2011b).

There has been an increase in the amount of affordable published information on food processing

However, most development agency programmes are focused on particular geographical or technical areas and rarely have comprehensive national coverage. Government institutions that provide certified training and capacity building to raise education and skill levels are the only realistic way to reach SMEs nationally. Some governments have promoted clusters of firms to make it easier for businesses to communicate with and learn from each other in a way that is not easily achieved by formal education (te Velde, 2002; Fisher and Reuber, 2002). Other governments have developed proactive policies to develop the SME sector: for example, in Ghana, the government's Rural Enterprises Development Programme involves financing new rural industries while raising tariffs on imports of potentially competitive products (Christian Aid, 2005). In Indonesia, the government has focused on development of home- and small-scale industries in rural areas, and similar policies have been adopted by the national government and several state governments in India.

In Indonesia, the government has focused on development of home- and small-scale industries in rural areas

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Governments can also stimulate linkages between TNCs and SMEs through brokering and linkage programmes that provide information on suppliers and sourcing opportunities (UNCTAD, 2001).

In many countries, public sector agricultural and food research institutes and university food science and technology departments are mandated to support agroprocessing enterprises through applied research and training/education. Where these institutions have adequate financing, and more importantly staff who are committed to fulfilling this mandate, there have been some successes, but many are failing to provide sufficient support. For these, there is a need to better coordinate their activities to make them more responsive to the needs of SMEs. Weak linkages with the private sector and a lack of basic understanding of the needs of food processors lead to an inability to direct applied research capability to solve local problems, or provide training, information and support that is relevant to local needs. This has been attributed to the loss of academics to the business sector with its relatively large salaries and benefits, but it is the lack of contact and understanding between academia and SMEs that results in little appreciation of the needs of processors. This may be due to an 'ivory-tower' mentality, lack of commercial awareness and other, often financial, constraints that prevent staff at institutions from taking local SME needs into account, let alone devising methods of meaningful assistance. The organizational and reward structures at education and research institutions are more often orientated towards staff promotion based on peer-reviewed publications rather than successful assistance to target SME beneficiaries. Tertiary education in food science, engineering, marketing and business management in many LDCs is characterized by outdated curricula and insufficient practical training programmes or support. As a result graduate programmes have little relevance to the actual needs of local food processing businesses and there is little willingness to devise and implement alternative programmes that would meet these needs. These constraints are barriers to enhancing export competitiveness, increasing the local raw material content of processed foods, and attracting foreign investors – all prerequisites for food processing SMEs to develop, to meet local demand for high-quality foods, or participate in GVCs and increase their contribution to national economic growth.

The lack of contact between academia and SMEs results in little appreciation of the needs of processors

Graduate programmes often have little relevance to the actual needs of local food processing businesses

To address these constraints, tertiary education and research institutes should work with relevant ministries (agriculture, health, industry and export development) and local NGOs and government agencies to address the following areas for improvement:

- Improve access to training by SMEs using information and awareness campaigns through nationwide workshops/seminars

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and road shows to educate entrepreneurs on the need for change and provide information on the support measures available. Use these to bring together research and education institutions and SMEs to discuss needs and constraints, and reorient their programmes to benefit SMEs.

- Train institutional staff to have adequate skills to assess SME needs, and design and implement training and support interventions that meet these needs. This requires a reorientation of attitudes and a more commercial approach by institutional staff.
- Adapt entry qualifications, duration and timing of courses to meet SME needs. Make all training practically oriented and affordable.
- Efficiently administer services for SMEs with more business-like attitudes and market-orientated commercial approaches, focusing on processors that show real potential, charging for services and setting targets that can be objectively measured. This may involve advice and training from local private sector trainers and consultants to assist university or research staff to adopt a more commercial approach.
- Train private sector consultants to improve skills and professionalism and encourage proactive support to SMEs. Develop training-of-trainers programmes to achieve more widespread professional levels of support, especially in rural areas.

Training requires re-orientation of attitudes and a more commercial approach by institutional staff

- Research options on technology choices and sources of equipment and specialist materials, product concepts, markets, management methods and credit provision, and make this information available to SMEs in a form that is understandable and usable.
- Develop well-established networks between support agencies, educational and other government institutions, credit providers and private sector service companies.
- Involve university art schools and design departments to support SMEs in label and packaging designs, promotional and marketing materials.
- Reorient university engineering staff to support local engineering workshops to focus on the needs of SMEs and improve equipment design and quality of construction to compete with imported equivalents. Provide engineering companies with access to institute workshop facilities for welding stainless steel and other fabrication equipment.

University engineering staff should support local engineering workshops to focus on the needs of SMEs

- Ensure that follow-up or outreach programmes are properly funded and routinely used to consolidate learning.
- Adopt policies to support applied research and development that are relevant to SME needs, that are coordinated with government agricultural and industrial development policies and do not conflict with them.

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Provision of specialist equipment, ingredients and packaging materials

Larger-scale food processors have options to locate and buy specialist equipment and materials by employing appropriately skilled staff or consultants, or for those entering into arrangements with TNCs, by using the lead company staff and FDI to procure the necessary inputs. In countries that have concentrations of food processing enterprises (e.g. in 'Food Parks' or export development zones), the demand for specialist materials and equipment may be sufficient to support commercial import agents and distributors; and where primary processing is the main type of activity, local engineering workshops or agricultural equipment suppliers are able to supply machinery made from mild steel, such as mills or oil presses. However, for most food processing SMEs, especially in LDCs, there is an almost total lack of information on, and access to, equipment for secondary processing, packaging and quality assurance. The majority of local engineering workshops do not have the skills or facilities to produce hygienically designed equipment, and lack stainless steel fabrication skills and facilities. The same is true for specialist ingredients and packaging materials (Table 5) that are needed to diversify the product range or upgrade production to meet supermarket specifications. In countries where processors are widely distributed, often in poorly accessed rural locations, small order sizes make operations by distributors of imported materials uneconomical.

For most SMEs, there is an almost total lack of information on, and access to, equipment for secondary processing, packaging and quality assurance

Different packaging materials and ingredients each have a range of properties and applications, but SMEs do not have the knowledge to select suitable materials themselves or have access to technical advice to assist them. There are usually no local packaging or specialist ingredient manufacturing facilities and materials have to be imported. But SMEs frequently do not have access to foreign exchange, nor the time and capability to deal with the importation bureaucracy. Even when SMEs are able to identify precisely their requirements and have the capital available to purchase imported equipment or materials, exporting companies may be unwilling to supply them because of small order sizes, which are inefficient and not economical to process. In some cases, manufacturers are unwilling to supply goods because they do not have confidence that they will be promptly paid.

SMEs frequently do not have access to foreign exchange for importing equipment

The constraints on equipment and materials supply can therefore be summarized as: 1) insufficient information available to SMEs on the types that are available; 2) lack of technical expertise to precisely identify, evaluate and specify materials and equipment that are suitable for SME operations; 3) difficulties by SMEs in accessing foreign exchange or dealing with import procedures; 4) unwillingness or inability of supply companies to meet the small orders that typically arise from SMEs.

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Table 5. Examples of equipment and materials required by food processing SMEs

Agro-industrial sector	*Materials*	*Equipment*
Bakery	Dried yeast, premixes, improvers, fillings, toppings, glazing agents, colourings, emulsifiers, antioxidants, flavours/essential oils, oleoresins, herbs, spices, seasonings, starch and starch derivatives, nutraceutical and functional ingredients, non-sugar sweeteners, plastic packaging films, labels, cartons	Mixers, weighing scales, dough dividers, provers, cutters, moulders, baking trays, bread/cake tins, sieves, calibrated containers, storage bins, heat sealers and other packaging machines
Confectionery	Non-sugar sweeteners, fillings, glazing agents, colourings, emulsifiers, antioxidants, flavours/essential oils, oleoresins, starch and starch derivatives, plastic packaging films, labels, cartons	Mixers, weighing scales, boiling pans, cutters, moulders, calibrated containers, storage bins, packaging machines
Cooking oils	Filter aids, plastic, glass and metal oil containers, labels	Oil expellers, presses, filters, filling and packing machines
Dairy	Starter cultures, enzymes, hydrocolloid stabilizers, starch and starch derivatives, nutraceutical and functional ingredients, casein, whey powders	Cream separators, butter churns, butter moulds, cheese vats, pasteurizers, cheese cutters, cheese presses, cheese moulds, yoghurt incubators, filters, boiling pans, ice cream makers, scales, thermometers, bottle cappers, filling and packing machines, water treatment equipment
Fruits and vegetables	Yeast, pectic enzymes, non-sugar sweeteners, colourings, pectins, clearing agents/finings, plastic or glass containers, labels, capsules	Juice extractors, blanchers, boiling pans, pasteurizing kettles, bottle coolers, washers and sterilizers, coring machines, deep-fat fryers, dryers, fermentation vessels, airlocks, filters, fruit presses, hydrometers, thermometers, peelers, reamers, refractometers, slicers, dicers, pH meters, liquidizers, pot sealers, labellers, heat sealers, cappers, corkers
Meat/fish	Herbs, spices, seasonings, emulsifiers, hydrocolloid stabilizers, antioxidants, colourings, plastic packaging films and trays, labels, cartons	Slicers, dicers, bowl choppers, smokers, fillers, sausage stuffers, scales, labellers, heat sealers, water treatment equipment

In theory, the first two constraints could be addressed by university food technologists or research institutes, but for reasons described above this rarely takes place. There are also few government or NGO organizations that assist with importation procedures, either because it is not part of their remit, or they view it as a commercial activity that they are not willing or equipped to get involved with as it may conflict with their charitable status. Two examples of successful support for SMEs, albeit on a small scale, are the Small Industries Development Organization (SIDO) in Tanzania (Mchomvu and Gedi, 2000; SIDO 2011) and a UNIDO-funded programme in Uganda (Dietz

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Some organizations have produced directories of local suppliers, or provided entrepreneurs with training or internet access to identify materials and equipment

et al., 2000). These organizations have produced directories of local suppliers, provided entrepreneurs with training or internet access to identify materials and equipment and, in the case of SIDO, placed bulk orders on behalf of SMEs and distributed materials in small quantities to the individual SMEs that are part of their programme.

This model should be expanded and replicated for small-scale food processors in all LDCs. One way would be to investigate the feasibility of creating a new 'supply agency' that could link SME support organizations with material and equipment suppliers. This agency could be a commercial operation, a not-for-profit company, or a programme operated by an international NGO or UN organization. In order to generate sufficient turnover, it is likely that the agency would need to operate regionally, and would consist of 'local hubs' in participating countries. These could be existing organizations that have a proven track record of effective support to food processing SMEs (e.g. staff at a Bureau of Standards, university food science department or local NGO). Their role would be to act as link-persons to entrepreneurs; to offer advice on technical specifications for equipment and materials; to collect and collate orders from entrepreneurs; to manage customs clearance and import duties; and to manage SME payments and accounts.

Staff at local hubs would have access to a coordinating office that would have three functions: 1) to maintain a supplier database constructed from existing supplier associations (e.g. www.ingridnet.com [accessed 17 March 2011]) and equipment fabricators that meet the necessary quality standards; 2) to manage an internet-based ordering and payments system; and 3) to maintain a register of specialist consultants who could provide ad hoc technical support. Once established, the agency would be self-financing, with operating costs covered by a mark-up on sales, made possible by both negotiating lower prices for bulk orders and adding a percentage to the sale price to SMEs. The anticipated benefits of such an agency in overcoming constraints faced by both SMEs and suppliers would be fourfold:

1. It could provide targeted technical advice to ensure that only materials and equipment that are suitable and have guaranteed quality are supplied to SMEs.
2. It would create bulk orders that both overcome suppliers' problems of uneconomically small order sizes and reduce unit costs.
3. It would be a single point of contact for suppliers and act as a payment guarantor. Electronic money transfers between hubs and the coordinating office would streamline and reduce transaction costs and allow SMEs to pay in local currencies, so overcoming their lack of access to foreign exchange.

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4. It would offer a new and potentially large market in developing countries that suppliers could not easily reach using their existing marketing and sales structures.

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