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TRADE INFORMATION BRIEF

VEGETABLES

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Participation in international trade has become one of the most important factors in increasing the prosperity of countries. Yet for many developing countries, perhaps particularly for those in Sub-Saharan Africa (SSA), trade is viewed primarily from a defensive perspective, with a focus on the disruptive effects of imports rather than on the opportunities presented by increased access to world markets. A key reason is the existence of information market gaps that are often associated with trade facilitation and development in developing countries – information on the export performance and potential of many developing countries remains incomplete.

The TRADE INFORMATION SERVICE series of market briefs aims to contribute to bridging this information gap for existing producers in the Southern African Development Community (SADC) who may not have the financial resources to generate a fully fledged market research process. The briefs are not intended to act as the detailed export market intelligence that successful exporting requires, but rather as a basic first-cut analysis of export prospects, to allow enterprises to make the decision on whether to initiate further market research.

Each Trade Information Brief will cover a product cluster of particular interest to members of SADC. The cluster may represent an existing key set of export products with potential for expansion, or a relatively new set where there is an indication of competitive advantage for the region.

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1. Introduction

The vegetable cluster is well established but also has significant potential for growth. International trade in fruit and vegetables has been growing at a much faster pace than other agricultural commodities over the past 40-odd years. Its share in world agricultural trade has increased from 10.6% in 1961 (US$3.4-billion) to 16.9% in 2001 ($70bn)[1]. More recently, from 2000 to 2004, the value of trade in fruit and vegetables[2] increased by over 40%, from $52bn to $74bn, at an annual growth rate of 9.3%.

The variety of commodities on offer is also increasing, as is the frequency at which these new varieties are being traded. Most of the trade in fruits and vegetables occurs within three geographic regions – the European Union (EU), the North American Free Trade Agreement (NAFTA) countries and East Asia (China and Japan). Traditionally, these areas have been supplied by nearby countries, with similar demand patterns and similar income per capita (intra-regional trade). However, these trends have been changing over the past few years, with greater imports of fruit and vegetables coming from southern developing countries.

With rising incomes worldwide, improved transport and various international trade agreements, markets around the world are expanding and their demand for variety is rising. Increasingly, fruit and vegetables are seen as essential in maintaining a healthy lifestyle, which not only increases the importance of fruit and vegetables as necessities, but also makes for higher year-round demand.

Critically important for SADC (and other southern countries) is the fact that their produce is harvested during the off-seasons of the northern countries. Counter-seasonality means they can supply the northern markets during periods when their 'domestic' supply is low, giving southern countries a foothold in a market that is often difficult to access.

The key to SADC countries being able to market their produce successfully, to dispel reservations and to increase awareness is to be able to supply produce of a certain quality, adhere to stringent phytosanitary regulations and standards (and compete with the produce of developed countries), and supply such produce timeously.

To this end, the two biggest issues facing potential SADC exporters is that of non-tariff barriers to market entry (predominantly phytosanitary and labelling), and logistics and marketing (including transport, infrastructure and product awareness). Some of these challenges are examined here.

1 All monetary figures in this paper are in nominal US$.

2 Excluding juices and purees, and including seeds and other propagating materials.

References

A full set of references for this report can be found at www.sadctrade.org/TIB/vegetables.

Before continuing, however, it is necessary to point out some definitional problems. The cluster category 'fruits and vegetables' not only encompasses a great variety of commodities, but also a range of different states of consumption, including fresh, frozen, dried, dehydrated, semi-processed and processed.

Depending on the definitions, the category can also include canned fruits and vegetables, along with fruit purees and juices. The entire cluster is thus particularly varied, and depending on the specific definition used in the literature and/or market reports, the commodities included therein can change a great deal.

In this report, we follow a definition in line with the harmonised system of codes (HS system), which distinguishes between fruit and vegetables and between fresh/dried vegetables and processed/prepared vegetables.

Table 1: Composition and growth of world fruit and vegetable exports

	Growth rate	Composition of export value	
	1989-2001 (%)	1967-1971 (%)	1997-2001 (%)
Fruits and derived products	4.2	48.5	39.1
Vegetables and derived products	5.2	26.0	32.7
Nuts and derived products	4.5	10.5	9.0
Fruit and vegetable juices	7.1	3.6	8.7
Pulses and derived products	3.6	4.7	3.9
Roots, tubers and derived products	2.6	5.0	6.0
Others	-1.4	1.7	0.6

Note: Product groups according to (UN) Food and Agriculture Organisation (FAO) definitions, including over 160 items (FAOSTAT) **Source:** FAO

We have therefore further sub-divided this rather large and unwieldy category into 'Vegetables', which we examine in this Brief (including fresh, dried and preserved but not processed) and 'Fruits', which we examined in a previous Brief (see www.sadctrade.org/TIB/fruit).

An example of the shares of the various components in the entire product cluster is shown in table 1.

2. Product description

2.1 Cluster

As mentioned earlier, this product cluster poses something of a definitional problem, as researchers often group the cluster into different combinations of commodities. As such it is difficult to compare figures across different reports. This report's cluster is in accordance to the HS classification system, where vegetables fall under chapter 07: edible vegetable and certain roots and tubers (for example, 0701 refers to potatoes fresh or chilled). Table 2 shows the HS codes and description for the various lines under chapter 07. The more digits a code displays, the more disaggregated the data. Therefore a six-digit code is simply a sub-category of a four-digit code, for example, '070810 peas' is a sub-category of '0708 leguminous vegetables'. Where only four-digit lines are listed, all the sub-categories are included; where there are six digit lines, certain of the sub-categories are omitted for various reasons.

2.2 Determinants of trade in vegetables

2.2.1 Supply-side factors

The climate, proximity of the grower to the market and the timing of the growing season are the most basic factors in determining the international supply of horticultural products. Other factors include the availability of land and water resources, human and financial capital, infrastructure (roads, railways and ports), the capacity to market the produce and the ability to access a market.

2.2.2 Demand-side factors

The demand-side factors of the northern countries revolve around changing demographics and consumption trends. In short, the demand for fresh fruit and vegetables in the northern hemisphere is predicted to increase more than any other food group over the next 15 years or so.

There are a number of reasons for this, the most important being increased health consciousness, changing social structures, increased labour participation (especially of women) and longer working hours, the reduced demand for foods that require a lot of time to prepare, higher per capita disposable income, increased availability of and demand for variety (including indigenous products) and the ageing nature of most northern countries' populations.

2.3 Organic produce

A rapid increase in the demand for organic produce, especially in the US, the EU and Japan, and a less rapid expansion of farmers in these regions employing organic producing techniques have created supply gaps.

Table 2: HS* codes for vegetables (Chapter 7)

0701	**Potatoes, fresh or chilled**	
0702	**Tomotoes, fresh or chilled**	
0703	**Onion, shallot, garlic, leeks (alliaceous)**	
0704	**Cabbages, cauliflowers, broccoli (brassica's)**	
0705	**Lettuce and chicory**	
0706	**Carrots, turnips, beetroot, radish & other roots**	
0707	**Cucumbers and gherkins**	
0708	**Leguminous vegetables**	
070810		Peas
070820		Beans
070890		Other leguminous
0709	**Other vegetables**	
070910		Artichokes
070920		Asparagus
070930		Aubergines
070940		Celery other than celeriac
070951		Mushrooms (Agaricus)
070952		Truffles
070959		Other mushrooms
070960		Capsicum or pimenta
070970		Spinach
070990		Other vegetables
0710	**Frozen vegetables (uncooked or cooked by steaming/boiling)**	
071010		Potatoes, frozen
071021		Peas, frozen
071022		Beans, frozen
071029		Other leguninous, frozen
071030		Spinach, frozen
071040		Sweet corn
071080		Other vegetables, frozen
071090		Mixed vegetables, frozen
0711	**Vegetables provisionally preserved (sulphur dioxide, brine etc,)**	
071110		Olives
071130		Capers
071130		Cucumbers and gherkins
071151		Mushrooms (Agaricus)
071159		Mushrooms, other
071190		Other vegetables (including mixed)
0713	**Dried leguminous vegetables**	
071310		Peas
071320		Chickpeas
071331		Mungo beans (and radiata)
071332		Adzuki beans
071333		Kidney beans
071339		Other beans
071340		Lentils
071350		Broad beans
071390		Other leguminous, dried
0714	**Manioc (cassava), sweet potatoes, arrowroot (other tubers)**	

* Harmonised System Code is an international method for classifying products for trading purposes

These supply gaps not only increase the price of organic produce so that consumers pay premiums of up to 200% of the price of normal produce, but also create opportunities for developing countries to increase their exports of such produce. Many developing countries use traditional production techniques that do not employ agrochemicals, which means they may already comply with organic standards, or if not, may only be a small alteration away from compliance.

At the same time, organic farming can raise production costs substantially – but more so for developed countries that historically have relied on chemicals/pesticides to control for diseases and pests.

The benefits from using organic production techniques are manifold. Organic farming and exporting such produce to foreign markets not only has the potential to create jobs (organic farming is far more labour-intensive than other farming techniques) and generate foreign currency, but also allows communities to achieve other goals, such as sustainable agriculture, environmentally friendly production, crop diversity and eco-balances. Thus, it is believed that developing countries have a comparative advantage in organic production. As such there is wide-spread optimism that organic farming can be used to revolutionise the agricultural sectors of developing countries, something development economists have always viewed as particularly important.

At present the US market for organic food is estimated at $9.3bn, and has grown by nearly 25% over the period 2000-2003. In Europe, growth rates range between 20% to 30% per annum, with increased health awareness the most important driving factor. Since major retail chains have entered the organic produce market, some commodities have seen growth rates of more than 50% per annum, and organic produce has become mainstream.

Organic techniques are entering all facets of production and now include not only fresh produce but even commodities such as baby food (60% of all baby food in Germany is organically produced). In Asia, Japan is the biggest market for organic produce, and the second-biggest in the world, with over $2bn in organic foods sold in a year. Countries like China, India, Singapore and Malaysia are beginning to follow suit.

3. Production and consumption

3.1 World trends

3.1.1 Production

World production of fruit and vegetables grew by 23% from 1961 to 1970, by 28% from 1970 to 1980, by 30% from 1980 to 1990 and by 49% from 1990 to 2000 – reaching 1,274-million tons by 2003 (220% overall growth from 1961 to 2003). Of this, world production of fruit reached 174-million tons in 1961 and grew to over 503-million tons by 2003.

Table 3 shows growth in vegetable production between various regions and a few selected countries. World production of vegetables was 881-million metric tons in 2005. The greatest levels of production occurred in Eastern and Southern Asia, followed by the EU, Africa, North America and the Middle East. Most of Eastern Asia's production occurs in China, which on its own accounts for a massive 94% of that region, and nearly 50% of all world production. China produces more than four-fifths of all garlic, spinach, asparagus and sweet potatoes, and more than two-fifths of all mushrooms, lettuce, cauliflower and broccoli, cabbage, aubergines, onions, cucumbers and gherkins. India makes up 89% of production in the South Asia region. The leading countries in vegetable production are China, India, the US and Turkey.

World growth in the production of vegetables has been strong over the last 25 years, at an annual average growth rate of 4.1% per year. This has been mainly due to the phenomenal growth rates in production of vegetables in China, and to a lesser extent countries like India, Iran, Mexico and Nigeria. China's almost unbelievable growth has seen vegetable output increase by nearly eight times (790%) over the last 25 years, or at 8.6% per year. Other regions, like the EU, have seen very small or even declining growth rates in recent years. Africa and Central America and the Caribbean have been growing at a healthy rate of over 3% per year, with countries like Egypt and Nigeria leading the way. More recently, Russia has also been expanding output, at 3.1% per annum. North America, buoyed by strong growth in Mexico, grew moderately from 1980 to 2000, but has subsequently slowed down to just 0.7% per annum from 2000 to 2005.

The SADC region currently produces 5.7-million metric tons of vegetables, up from 4.4-million tons in 1980, at an average annual growth rate of 1% per annum for the last 25 years and 1.5% per annum over the last five years. Within SADC, South Africa accounted for 40% of the production, Tanzania for 22%, the DRC for 8.4%, Madagascar for 6.4%, and Angola and Zambia for 5% each. The only countries in this region to record significant long-term growth trends have been Namibia (4.86% per annum from 1980-2005), Mauritius (4.22%), South Africa (1.62%) and Malawi (1.51%).

Table 3: Growth in vegetable production by region and selected countries (tons)

Vegetables & melons	Year				Annual growth (%)	Annual growth (%)	World market share (%)
Regions	**1980**	**1990**	**2000**	**2005**	**2000-2005**	**1980-2005**	
World	324,229,145	461,868,317	746,236,775	881,136,456	3.4	4.1	100.0
East Asia	81,881,974	157,312,275	357,574,347	462,830,225	5.3	7.2	52.5
South Asia	39,706,650	55,135,107	81,055,032	90,177,007	2.2	3.3	10.2
EU (15)	45,506,753	51,776,884	57,615,453	57,129,078	-0.2	0.9	6.5
EU (25)	-	-	66,619,269	66,037,442	-0.2	0.0	7.5
Africa	23,820,725	33,098,312	47,916,562	53,072,309	2.1	3.3	6.0
North America (NAFTA)	30,605,276	39,976,422	50,132,690	51,818,306	0.7	2.1	5.9
Middle East	25,967,347	38,351,591	49,256,416	51,242,136	0.8	2.8	5.8
South America	11,757,612	14,305,684	19,387,011	20,284,042	0.9	2.2	2.3
Central America & Caribbean	6,155,549	8,943,019	14,754,944	17,634,838	3.6	4.3	2.0
Europe (Former)	16,165,555	16,481,385	16,697,208	17,541,905	1.0	0.3	2.0
SADC	4,495,673	5,236,699	5,310,917	5,725,685	1.5	1.0	0.6
Selected countries	**1980**	**1990**	**2000**	**2005**	**2000-2005**	**1980-2005**	**%**
China	55,404,826	128,382,471	328,806,647	435,024,075	5.8	8.6	49.4
India	35,975,100	48,936,575	72,283,700	80,528,500	2.2	3.3	9.1
US	24,657,505	31,335,362	38,420,055	39,185,160	0.4	1.9	4.4
Turkey	13,028,270	18,076,020	24,639,362	25,395,111	0.6	2.7	2.9
Italy	13,429,020	14,136,336	16,389,029	16,686,924	0.4	0.9	1.9
Egypt	7,402,361	9,246,131	15,106,009	16,140,402	1.3	3.2	1.8
Russian Federation	-	-	13,078,040	15,200,500	3.1	0.0	1.7
Iran, Islamic Rep of	4,996,000	9,839,983	11,498,627	13,495,000	3.3	4.1	1.5
Spain	8,541,990	11,509,859	12,118,715	12,348,273	0.4	1.5	1.4
Korea, Republic of	8,707,048	9,948,962	12,235,076	12,160,100	-0.1	1.3	1.4
Japan	15,160,800	14,468,100	12,677,624	11,593,600	-1.8	-1.1	1.3
Mexico	4,295,369	6,475,978	9,419,083	10,013,516	1.2	3.4	1.1
Nigeria	3,158,000	4,668,000	7,864,000	8,270,000	1.0	3.9	0.9
France	7,061,481	7,513,728	8,952,564	8,185,000	-1.8	0.6	0.9

Note: Vegetables and melons do not include cassava, yams, sweet potatoes, pumpkins and gourds

Source: FAOSTAT and own calculations

Table 4 details world production levels of selected vegetables from various regions for 2005. More than half of the world's cassava (110-million tons) and 99% of the world's yams (38-million tons) are produced in Africa, whilst East Asia produces the majority of many other vegetables – 89% of the world's asparagus, 88% of the world's spinach, 84% of the world's sweet potatoes, more than half of the world's aubergines, lettuce, cabbages, chillies and peppers, garlic, cucumbers and gherkins. South-East Asia's major crop is cassava (44-million tons), followed by sweet potatoes, beans, onions and cabbages. The EU produces significant amounts of olives (71% of total world production), mushrooms (33%), carrots (21%), potatoes (19%), peas (19%), and tomatoes (14%). North America (NAFTA) produces

soybeans (41%), lentils (35%), lettuce (23%) and peas (23%), while the Middle East produces lentils (21%), tomatoes (14%), olives (13%) and chick-peas (12%). South Asia produces 75% of all chick-peas, 32% of lentils, 31% of cauliflower and 27% of aubergines.

The fastest growing varieties over the past 15 years have been asparagus (at 8.4% per annum), spinach (8.1%), aubergines (6.9%), cucumbers and gherkins (5.9%), chillies and peppers (5.8%) and garlic (5.6%). More recently, soybean and mushroom production has been growing by over 5% per annum.

Table 4: World and regional production of selected vegetable varieties in 2005 and growth rates

	Production by region, 2005 ('000 tons)								Annual growth (%)		% share
Selected products	**World**	**Africa**	**E Asia**	**SE Asia**	**EU**	**M East**	**NAFTA**	**S Asia**	**00-05**	**90-05**	
Potatoes	321,974	15,394	79,417	1,984	59,606	10,975	25,696	32,787	-0.4	1.3	22.2
Soybeans	209,532	1,133	17,615	1,555	921	170	85,895	6,032	5.4	4.5	14.4
Cassava	203,863	110,507	4,216	44,766	-	-	24	6,920	2.8	2.0	14.0
Sweet potatoes	129,889	11,477	109,376	4,317	57	5	748	1,271	-1.4	0.4	8.9
Tomatoes	124,748	14,634	32,875	1,061	17,579	17,687	15,776	8,188	2.8	3.3	8.6
Cabbages	69,481	1,777	40,296	2,400	4,940	1,147	2,555	6,260	3.6	0.0	4.8
Onions & shallots	62,264	5,616	23,428	2,120	5,064	4,498	5,107	7,617	3.3	4.3	4.3
Cucumbers & gherkins	41,744	1,049	27,707	702	2,053	4,279	1,619	176	4.0	5.9	2.9
Yams	39,897	38,089	175	29	2	-	-	-	0.9	4.3	2.7
Eggplants	30,518	1,412	17,477	502	580	1,829	117	8,363	2.4	6.9	2.1
Beans	25,419	3,308	4,781	3,256	1,001	1,091	3,078	3,665	2.4	1.3	1.8
Chillies & peppers	24,988	2,205	13,166	919	1,961	1,994	2,875	116	3.8	5.8	1.7
Carrots	23,908	1,131	9,096	324	5,057	575	2,282	627	2.8	3.8	1.6
Lettuce	22,382	271	11,745	1	3,084	605	5,313	822	4.1	4.5	1.5
Peas	20,722	942	3,440	68	4,047	111	4,838	4,145	1.8	-0.8	1.4
Pumpkins, squash	18,978	1,897	6,398	596	841	1,304	1,432	4,036	2.7	4.0	1.3
Cauliflower	16,364	307	7,509	69	2,105	331	590	5,107	2.2	4.0	1.1
Garlic	14,515	336	11,539	281	247	233	281	658	5.5	5.6	1.0
Olives	14,512	1,810	3	-	10,354	1,939	128	-	-1.4	3.2	1.0
Spinach	12,939	81	11,431	86	500	247	435	116	6.5	8.1	0.9
Chick-peas	9,173	328	12	230	28	1,113	338	6,889	2.9	2.0	0.6
Asparagus	6,648	4	5,936	34	240	10	173	-	7.8	8.4	0.5
Lentils	4,032	77	160	1	16	842	1,428	1,309	3.7	3.1	0.3
Mushrooms	3,358	12	1,507	47	1,127	13	476	48	5.2	4.4	0.2

Source: FAOSTAT and own calculations

In SADC, vegetable production is characterised by small-scale farms (most often subsistence farming) producing vegetables that cater for the needs of the domestic market. The FAO estimates that the most produced vegetable by far (in tons) is cassava (40.4-million tons), followed by potatoes (4.6-million tons), sweet potatoes (two million tons) and beans (0.7-million tons). Whilst Angola, the DRC, Malawi, Mozam-

Table 5: SADC production of vegetable varieties, 2005 ('000 tons) and annual growth rates

Selected varieties	SADC	Ang	DRC	Mal	Maur	Moz	SA	Tan	Zam	Zim	00-05 (%)	90-05 (%)
Artichokes	0.6	-	-	-	-	-	-	-	0	0.2	-0.3	17.6
Asparagus	2	-	-	-	-	-	2	-	-	0.2	-18.0	-4.2
Beans	759	108	114	80	2	-	101	291	-	54	1.4	0.3
Cabbages	254	-	23	50	6	-	174	-	-	0.2	0.0	-0.6
Carrots	141	-	0.3	-	5	-	135	-	-	0.1	5.5	3.1
Cassava	40,471	8,606	14,974	2,600	0.1	6,150	-	7,000	950	190	2.0	1.3
Cauliflower	21	-	-	-	2	-	19	-	-	0.3	-0.7	-3.6
Chick-peas	67	-	-	35	-	-	-	32	-	0.3	2.6	0.2
Chillies & peppers	2	-	-	-	1	-	1	-	-	1	8.8	6.1
Cucumbers & gherkins	27	-	0.3	-	9	-	17	-	-	0.4	1.9	0.3
Aubergines (eggplants)	2	-	-	-	2	-	-	-	-	-	0.0	1.8
Lentils	2	-	-	2	-	-	-	-	-	-	20.8	7.6
Lettuce	49	-	14	-	2	-	33	-	-	0.2	1.5	-0.6
Mushrooms	9	-	-	-	-	-	9	-	-	0.3	4.1	2.8
Olives	-	-	-	-	-	-	-	-	-	-	0.0	0.0
Onions	634	13	53	50	4	3	426	55	27	2	4.3	3.0
Peas	73	-	1	5	-	-	24	34	-	5	1.8	1.9
Potatoes	4,604	307	93	1,800	12	80	1,909	260	11	35	1.7	5.5
Pumpkins & squash	426	-	39	-	8	0.6	379	-	-	-	2.1	2.2
Soybeans	393	-	15	-	-	-	277	2	15	84	3.0	2.5
Spinach	-	-	-	-	-	-	-	-	-	-	0.0	0.0
Sweet potatoes	2,047	659	230	-	0.5	66	65	970	53	2	7.4	4.2
Tomatoes	793	13	40	35	13	9	494	145	25	12	2.8	1.1

Source: FAOSTAT and own calculations

bique, Tanzania and Zambia are all large producers of cassava, potatoes, sweet potatoes and beans, most other vegetables are produced either in South Africa or to a lesser extent Tanzania and Zimbabwe. Simply put, the current production patterns in the region are not aimed at the export market, but on supplying food for the local population.

3.1.2 Consumption

Of course the fact that a country can produce a large output does not necessarily mean that it will be a big net exporter – this depends on the size of the domestic market and whether excess produce is harvested. In the case of China, the world's largest producer of vegetables, the domestic market is so big that the country exports relatively little. This is also the case for India, Egypt, Iran and Nigeria, and similarly for the regions East Asia, South Asia and Africa. China is the world's biggest market (larger even than all the other regions combined), with 378-million tons consumed in a year, followed by India with 78-million tons, the US (39.6-million tons), Turkey (23.4-million tons), Russia

(15.2-million tons), Japan (14.8-million tons), Egypt (13.7-million tons), Iran (13.1-million tons), and Korea (11.4-million tons).

Table 6 shows that the region with the most trade, both in imports and exports, is clearly the EU, accounting for about 44% of world trade in 2002 (measured in metric tons, not value), compared to 6.7% of world consumption, followed by NAFTA, East Asia and Central America and the Caribbean. Whilst countries like China and India predominantly supply their domestic markets with their own produce, other countries such as Germany, the UK, Japan and Russia are clearly net importers of vegetables. Turkey, Italy, Spain and Mexico are net exporters.

Table 6: World production, trade and consumption of vegetables by region and selected countries, 2002 (tons)

Regions	Production	Imports	Exports	Domestic supply	% of world trade	% of world consumption
World	**807,207,519**	**43,783,279**	**45,778,506**	**805,046,043**	**100.0**	**100.0**
East Asia	410,563,277	4,219,002	6,135,557	408,546,722	11.6	50.7
South Asia	88,259,945	539,442	1,047,959	87,751,432	1.8	10.9
EU (15)	54,659,865	19,430,588	19,931,238	54,064,365	43.9	6.7
North America (NAFTA)	49,776,902	8,254,775	8,045,492	49,986,188	18.2	6.2
Middle East	49,433,847	1,871,914	2,725,696	48,563,191	5.1	6.0
Africa	47,375,883	1,428,193	1,280,707	47,534,478	3.0	5.9
South East Asia	27,364,750	1,530,008	1,102,674	27,734,410	2.9	3.4
South America	20,194,323	822,496	1,293,827	19,723,202	2.4	2.4
Central America & Caribbean	15,453,203	1,013,882	4,297,172	12,173,650	5.9	1.5
SADC	5,379,854	237,093	118,450	5,501,175	0.4	0.7
Selected countries						
China	383,235,449	1,158,215	6,050,212	378,243,452	8.0	47.0
India	79,260,500	69,650	948,878	78,381,272	1.1	9.7
US	38,217,885	5,381,855	3,938,350	39,661,390	10.4	4.9
Turkey	24,644,512	17,827	1,253,218	23,409,121	1.4	2.9
Russian Federation	13,450,790	1,781,891	28,337	15,206,049	2.0	1.9
Japan	12,246,500	2,655,438	11,469	14,890,469	3.0	1.8
Egypt	14,115,000	14,608	435,450	13,702,190	0.5	1.7
Iran, Islamic Rep of	13,442,000	35	335,084	13,106,951	0.4	1.6
Korea, Republic of	11,157,628	405,349	72,917	11,490,060	0.5	1.4
Italy	14,178,746	1,501,538	5,018,756	10,661,528	7.3	1.3
Nigeria	8,246,000	109,972	282	8,355,689	0.1	1.0
Germany	3,565,540	5,446,245	794,023	8,217,811	7.0	1.0
Spain	12,060,800	643,532	4,861,778	7,842,554	6.1	1.0
Mexico	9,159,732	433,670	3,433,893	6,159,509	4.3	0.8
UK	2,747,473	3,385,609	275,019	5,858,062	4.1	0.7

Note: Vegetables do not include cassava, yams, sweet potatoes, pumpkins and gourds

Source: FAOSTAT and own calculations

The SADC region trades relatively little, accounting for 0.4% of world trade compared to 0.7% of world consumption in 2002 (see table 6). The biggest consumer in the region was South Africa, with 39% of the total market, followed by Tanzania with 21.4%, the DRC with 8.5%, Madagascar with 6.2% and Angola with 6% of the total market. South Africa is also by far the biggest exporter in the region, with most of the other countries (and indeed the entire region) maintaining a trade deficit in vegetables. The only other countries that had a trade surplus in 2002 were Tanzania, Madagascar and Zimbabwe.

Table 7: SADC production, trade and consumption of vegetables, 2002 (tons)

Region/countries	Production	Imports	Exports	Domestic supply	% of SADC production
SADC	5,379,854	237,093	118,450	5,501,175	100.0
South Africa	2,198,376	33,570	69,335	2,162,612	40.9
Tanzania, United Rep of	1,181,000	7,777	11,578	1,177,200	22.0
Congo, Dem Republic of	449,550	19,314	205	468,659	8.4
Madagascar	343,610	789	4,986	339,413	6.4
Angola	271,000	57,060	1	328,059	5.0
Zambia	267,400	5,412	4,143	268,669	5.0
Malawi	255,800	494	266	256,028	4.8
Zimbabwe	157,030	3,357	17,026	143,361	2.9
Mozambique	116,700	11,319	73	127,946	2.2
Mauritius	80,048	21,878	547	101,379	1.5
Botswana	16,700	37,708	194	54,214	0.3
Swaziland	10,700	16,523	1,273	25,950	0.2
Lesotho	18,000	3,750	300	21,450	0.3
Namibia	12,000	15,095	8,523	21,248	0.2
Seychelles	1,940	3,047	0	4,987	0.0

Source: FAOSTAT and own calculations

3.1.3 Food consumption patterns and trends

Food markets are constantly evolving, driven not only by changes in consumer preferences but also by technology, linkages between members of the food supply chains, and prevailing policies and business environments. A primary driving force in the global food market is the consumer. Income growth, lifestyle changes brought about by urbanisation and changing family structures have resulted in diet changes amongst consumers worldwide. Because of increases in purchasing power or the increased opportunity cost of time required for preparing food, the demand for higher value and processed food products has expanded globally.

But although consumer diets are being upgraded worldwide, food purchase patterns vary across countries based on income levels. Consumers in developing countries whose diets were traditionally high in low-

value, carbohydrate-rich cereals have increased their consumption of higher value meats, fruits and vegetables. Consumers in wealthier countries are increasingly changing their diets toward relatively higher value foods, although this higher value does not necessarily reflect increases in the quantity and nutrient value of the food basket but rather the value-added service embodied in the products, which reduces the time required to prepare such foods for consumption.

As such, developing countries are registering rapid increases in the retail sales of high-value foods (and the number of supermarkets and other retail chains are increasing), whilst developed countries are seeing a rise in sales of products that meet consumer demands for variety, food safety and quality.

To meet these increasingly varied needs, multinational food retailers and manufacturers are expanding their presence in developing countries, and food retailers and suppliers are adding value and differentiating their products in developed countries (existing supermarkets are expanding their product selection, whilst food companies create new brand names, premium quality or convenience products).

These ongoing changes are driving food supply chains to adopt closer co-ordination between producers and retailers to facilitate the customisation of products to meet consumer demands. However, as the food industry is becoming more global, food markets are increasingly responding to consumer preferences at a local level and catering to specific demands in each market. Thus, being able to supply a specific market and compete successfully in that market require in-depth knowledge of conditions and consumer habits, as well as complex models that can project future growth and preference changes. The existence of minor players therefore becomes less likely, as efficiency, competition, massive marketing and research overheads and various barriers to entry favour bigger (multinational) companies, or at least, collaborative efforts that combine resources and produce, and co-ordinate marketing strategies for smaller farms/companies.

3.2 Europe

3.2.1 The European Union

The EU market for vegetables in the original 15 countries is beginning to reach levels of saturation. The commodity has historically been income inelastic, which means that the volume of the commodity purchased does not necessarily increase at the same rate as income levels. Thus spending on vegetables as a proportion of an individual or household's income has declined. However, more recently, the growth in vegetable consumption has been linked to lifestyle changes and people's new-found health consciousness. This is particularly true for or-

ganic produce, which has experienced phenomenal growth rates over the past few years (especially in the wealthier countries of the original 15 EU members).

The new accession countries have a slightly higher average per capita consumption of vegetables, with the leading countries in the EU being Cyprus (with 150.1 kg per capita per year), Poland (111 kg/capita), Slovenia (100.8 kg/capita), Germany (84.2 kg/capita), Italy (78.2 kg/capita), the Czech Republic (78.7 kg/capita), Hungary (62.7 kg/capita), Belgium (61.7 kg/capita), Spain (54.8 kg/capita), the Netherlands (52 kg/capita) and Finland (51.9 kg/capita). Table 8 shows selected countries' vegetable consumption, by thousands of tons sold.

Table 8 shows some data discrepancies, which depend on the data source. Most of the table is derived from a CBI report, which collects data from various sources, including CTIFL, DEFRA, MAPYA, ZMP, and other official commodity boards for the relevant EU countries. The FAO data has been included as a comparison. As the data shows, the

Table 8: EU consumption of vegetables by variety, 2002 ('000 tons)

Commodity	Germany	France	Spain	UK	The Netherlands
Total (CBI report)	6,991	3,407	2,373	2,336	504
Total (FAO)	7,468	8,245	6,052	5,288	1,325
Tomatoes (CBI)	1,715	286	593	305	41
Tomatoes (FAO)	1,248	1,421	1,880	1,079	252
Onions (CBI)	518	80	287	317	42
Onions (FAO)	450	406	790	501	191
Carrots	527	179	133	311	37
Cabbages	778	-	64	140	-
Lettuce/endives	253	109	239	195	50
Cucumbers	532	69	-	116	40
Mushrooms	184	-	37	110	16
Beans	169	-	101	37	20
Peas (CBI)	105	-	-	55	-
Peas (FAO)	59	29	6	233	16
Cauliflower	-	53	-	244	43
Peppers & capsicum	-	-	265	-	14
Asparagus	115	19	24	-	-
Leeks	79	65	-	-	19
Spinach	76	-	-	-	-
Celery	49	-	-	-	-
Melons	-	136	-	-	-
Artichokes	-	23	-	-	-
Turnips	-	-	-	73	-
Other	1,894	532	630	427	-277
Potatoes	5,952	3,964	3,291	6,665	1,426

Source: CBI and FAOSTAT

volume of vegetables consumed can be greatly under- or overestimated, depending on the data used. Nevertheless, the table gives a rough approximation as to which vegetables are consumed by which countries. Most of the European countries consume large amounts of tomatoes, onions and carrots. Potatoes are also consumed in significant quantities; however, the CBI report does not carry any information on potatoes, as they were excluded on definitional issues. Information on other vegetable varieties is also somewhat sketchy, but one can ascertain that cabbages and cucumbers, for example, are consumed in larger quantities in Germany and the UK than, say, in Spain, which seems to consume more peppers.

One can broadly divide the EU market into two categories based on socio-economic factors – those countries in the northern and western regions, and those in the south. The southern EU members (mostly along the Mediterranean) tend to consider fresh vegetables as an essential part of their diet, and as such are not likely to change their spending habits (or the quantity of vegetables they consume) when factors such as price or income levels change. They also tend to spend more time purchasing (at markets) and preparing vegetables. Consumers in the northern and western regions are more time-constrained and prefer convenience above all – supermarkets, retail outlets, fast-food chains and products that are sliced, diced, pre-packaged and even pre-peeled. Vegetables that take longer to prepare are expected to experience decreasing consumer demand, whilst those that can be packaged/prepared in a way that reduces preparation time and/or add extra benefits/value will do better going forward. Examples include frozen vegetables, oven-baked chips, pre-peeled and sliced butternut, tomato paste, canned tomatoes and other canned vegetables, and a whole array of ready prepared meals with vegetables as ingredients.

The key trends in the European market are as follows:

- An ageing population, which leads to a bigger out-of-house market (restaurants, etc.);
- Increased demand for variety (especially exotics), out-of-season produce and ingredients for ethnic minority group foods;
- Smaller households and increased demand for convenience, smaller portions and 'mini products', and more time-friendly products (pre-processed, pre-cooked, take-out, etc.);
- Increased demand for organic produce; and
- Health foods.

3.3 North America

Rising income, higher educational attainment, improved diet and health knowledge, a growing population that is becoming older and

more diverse in race and ethnicity, and people eating out more frequently are changing the consumption patterns of the US population. As these patterns change, so does the demand for vegetables, whether fresh, processed, dried or preserved. A number of emerging trends can be identified.

First is the current focus on health, partly due to increased levels of education, but also due to government and other institutions' promotion of healthy eating habits. Consumers are more aware of their health and therefore more likely to consume more vegetables.

The second major factor is increased income levels, which, as explained earlier, can have both positive and negative effects on vegetable consumption. A good example is frozen potato chips. On the one had, the demand for this product is anticipated to increase as more people eat out; on the other, such demand could decrease as people become more aware of the negative health effects of fried chips.

Linked to this is the third and perhaps most important trend: the increased demand for convenience. Higher levels of income or higher wage rates might induce people to work longer hours, but this would mean less leisure time (or time for household production) and therefore a higher opportunity cost for time. The result is a demand for food which is convenient and time-saving, especially amongst the higher income groups, which makes it likely that people will be prepared to pay a premium for convenient foods. At the same time it will encourage firms to supply these higher value (and presumably higher profit) products.

Related to the above three factors is the changing demographics of the US population. Like most developed countries, certain sections of the US population are ageing (whites), and household structures

Table 9: Direct and indirect income effects on per capita consumption of fruit and vegetables in the US

			Indirect income effect	
Commodity	**Total income effect**	**Direct income effect**	**Eating out**	**Knowledge**
Fruit				
Citrus	1.70	1.85	-1.77	1.83
Apples	1.93	1.95	-1.81	1.81
Grapes	1.23	1.21	-1.42	1.48
Other fruit	1.48	1.36	-1.22	1.36
Vegetables				
Fried potatoes & chips	0.19	-0.47	1.75	-1.08
Other potatoes	-1.86	-2.53	0.49	0.19
Tomatoes	0.86	0.76	-0.01	0.11
Lettuce	2.12	1.42	0.18	0.50
Other vegetables	0.65	0.63	-0.46	0.47

Source: US Department of Agriculture (USDA)

are changing. There are more single households (especially female-headed households), fewer conventional nuclear families and a great deal more households where both partners are working. This changing structure of households is expected to decrease the time available for food preparation, and thus increase the consumption of certain vegetables (for example, lettuce, tomatoes and ready-prepared vegetables) at the expense of others (gem squash, pumpkins, leeks, etc.).

Other factors expected to influence the quantities of vegetable consumed in the future are the increasing diversity of the US population in terms of ethnicity, greater levels of urbanisation and the migration of people to different regions within the US. Table 10 shows the predicted effects of these factors.

Table 10: Effects on growth of fruit and vegetable consumption in the US, 2000 - 2020 (%)

		Per capita effects							
Commodity	**Market growth**	**Net**	**Income**	**Age**	**Region**	**Urbanisation**	**Race**	**Household type**	**Education**
Fruit									
Citrus	26.68	7.40	1.87	0.48	-0.62	0.45	2.48	0.61	2.13
Apples	27.20	7.84	1.93	0.95	-0.55	0.47	2.42	0.47	2.14
Grapes	24.00	5.13	1.23	0.59	-0.45	0.40	1.35	0.31	1.69
Other fruit	26.21	7.00	1.48	1.96	0.06	0.50	1.33	0.06	1.61
Vegetables									
Fried potatoes & chips	7.81	-8.60	0.19	-5.76	0.06	-0.33	-1.72	-0.21	-0.82
Other potatoes	14.45	-2.97	-1.86	3.18	-0.76	-0.50	-2.19	-0.94	0.12
Tomatoes	19.43	1.25	0.86	-0.75	0.11	0.08	0.88	-0.10	0.18
Lettuce	23.96	5.09	2.12	0.68	0.10	0.26	0.37	0.84	0.71
Other vegetables	22.21	3.61	0.65	1.34	-0.04	0.14	0.54	0.41	0.57

Source: USDA

Whilst all these factors affect the per capita consumption of vegetables, the size of the market will also continue to grow as the population grows (the US population is estimated to grow by 50-million people by 2020). The upshot of this is that vegetable consumption in the US is expected to grow significantly in the projected future.

Currently the vegetable that is consumed in the greatest quantities in the US is potatoes, (some eight million tons in 2004) followed by lettuce (2.5-million tons), onions (2.1-million tons), tomatoes (1.8-million tons) and watermelons (1.5-million tons). Whilst none of these have experienced much growth in the four years from 2000 to 2004 (absolute values of potatoes and watermelons have declined since 2000), other vegetable varieties have experienced strong positive growth, such as cherry tomatoes (12% average annual growth in 2000-2004), squash (8.3% growth), honeydew melons (8.1%), cantaloupes (6.9%), aubergines (7.3%) and bell (5.8%) and chilli peppers (6.1%) (see table 11).

Table 11: US consumption of seleted fresh vegetables (tons)

Product	2000	2001	2002	2003	2004	Annual growth (%)
	899,910	939,780	971,460	1,314,495	1,175,085	6.9
Honeydews	162,900	151,155	160,695	231,885	222,480	8.1
Watermelon	1,572,840	1,500,930	1,632,105	1,588,050	1,516,635	-0.9
Artichokes	27,675	27,360	29,430	27,675	26,595	-1.0
Asparagus	136,890	132,615	132,615	150,390	152,460	2.7
Broccoli	416,250	400,275	415,890	410,490	403,740	-0.8
Cabbage	565,920	560,700	562,140	604,080	597,150	1.4
Carrots	558,045	544,815	545,355	550,215	518,625	-1.8
Cauliflower	207,900	214,785	216,630	217,575	221,715	1.6
Celery	692,865	699,525	742,995	753,255	802,440	3.7
Sweet corn	466,785	431,595	484,290	481,410	478,215	0.6
Cucumbers	550,980	551,925	564,750	553,095	624,150	3.2
Aubergine	61,335	60,345	61,695	64,305	81,180	7.3
Lettuce	2,458,575	2,470,815	2,419,200	2,500,065	2,506,995	0.5
Onions	2,184,255	2,279,880	2,302,470	2,233,710	2,426,715	2.7
Peppers, bell	572,445	618,075	642,870	659,520	716,220	5.8
Peppers, chilli	132,885	142,335	219,870	179,820	168,255	6.1
Squash	220,185	242,820	275,985	281,655	302,940	8.3
Tomatoes	1,861,065	1,828,170	1,964,160	2,006,505	2,081,565	2.8
Cherry tomatoes	113,985	125,865	123,705	137,205	181,575	12.3
Subtotal	13,863,690	13,923,765	14,468,310	14,945,400	15,204,735	2.3
Potatoes	8,156,610	7,690,275	7,677,990	7,694,955	7,939,890	-0.7
Sweet potatoes	178,695	165,465	189,630	173,655	183,600	0.7
Total	22,198,995	21,779,505	22,335,930	22,814,010	23,328,225	1.2

Source: Economic Research Service, USDA

Overall, from 2000 to 2004, the market has experienced rather slow growth of 1.2% on average per annum, from 22.2-million tons of fresh vegetables to 23.3-million tons. However, the import penetration ratio (the percentage of the market that is supplied by imports from foreign producers) has increased by 2.2%, with the sourcing of garlic, squash, asparagus, artichokes and cucumbers most rapidly changing from being US-based to being foreign-based. Asparagus, at 71%, is the variety with the highest import penetration, which means 71% of the domestic market is supplied by producers located outside of the US. Commodities with present medium to high import penetration ratios are those that potential exporters can most likely supply competitively and thus gain a comparative advantage. Such commodities should therefore be targeted. Very few opportunities exist for the supply of commodities such as lettuce, which is almost entirely supplied by domestic producers.

(For more information on the consumption patterns of vegetables by type, region, age, race, ethnicity, income and education level, please visit the USDA website at www.ers.usda.gov/briefing/consumption.)

Table 12: US fresh vegetable market: import penetration (%)

Product	2000	2001	2002	2003	2004	2005	Change in penetration
Asparagus	58.3	59.8	64.9	70.1	69.6	71.7	13.4
Broccoli	6.6	7.4	8.1	7.4	8.2	7.4	0.8
Carrots	6.4	7.5	7.8	7.3	8.2	7.4	1.0
Cauliflower	3.6	3.5	4.9	4.4	5.9	4.8	1.2
Celery	3.6	4.4	5.0	3.3	2.8	3.9	0.3
Sweet corn	2.0	1.9	2.0	1.8	1.8	1.7	-0.3
Bell peppers	22.2	24.2	28.2	27.2	27.3	27.1	4.9
Onions	9.1	12.1	10.9	11.6	11.0	11.6	2.5
Tomatoes	31.6	35.0	34.3	39.0	38.8	37.9	6.3
Cabbage	3.6	4.5	4.2	3.5	3.4	3.5	-0.1
Spinach	1.9	5.0	3.2	3.9	3.5	3.6	1.7
Cucumbers	42.6	45.4	44.9	49.2	50.4	49.5	6.9
Artichokes	47.9	48.6	52.8	53.4	62.3	56.6	8.7
Snap beans	8.7	8.8	9.8	9.9	10.4	10.1	1.4
Aubergine	37.7	38.3	40.8	41.9	42.8	42.6	4.9
Radishes	25.9	21.4	25.7	24.8	27.9	24.0	-1.9
Garlic	29.0	31.6	36.5	37.8	44.0	42.9	13.9
Lettuce	0.9	1.1	1.4	1.3	1.2	1.3	0.3
Squash	30.7	36.1	34.8	41.1	41.6	41.4	10.7
Watermelon	11.4	11.3	11.2	12.3	14.3	13.2	1.8
Cantaloup	35.6	33.6	34.7	34.3	32.8	34.1	-1.5
Honeydews	27.3	24.8	27.2	25.3	26.4	26.6	-0.7
All fresh	13.9	15.1	15.7	16.2	16.0	16.1	2.2

Source: Economic Research Service, USDA

3.4 Asia

3.4.1 China

China is by far the world's biggest market and has traditionally been a large consumer of vegetables. Vegetable consumption is still high, but newer varieties and processed products are becoming more important. At 7% to 8% annually, the Chinese economy is growing rapidly, and there have been vast improvements in living standards, resulting in striking changes in consumption habits. This economic growth boosts Chinese consumer incomes and purchasing power, and therefore their demand for food. While the population growth rate slows (to less than 1% per annum) and per capita income rises (to more than 6% real annual growth in urban areas), spending on food is growing, although at a slower rate than the rise in income. The composition of food demand is also changing, with the demand for meat, poultry, fish,

fresh fruit and vegetables and other high-value products growing faster than for staples such as rice, wheat and traditional vegetables. After decades of limited consumption choices, China's emerging middle class is acquiring a taste for convenience and high-value foods, such as instant noodles, baked goods, exotic fruits, dairy products, fast food and processed foods, such as frozen vegetables. The food processing and food retail sectors have also grown and developed rapidly, which reflects the rising demand for convenience and quality. Chinese consumers are beginning to visit restaurants more frequently, travel more and demand foods with specific attributes. At the same time, consumer awareness of environmental protection, food safety and health issues is emerging, as well as a demand for 'green food', organic and sanitation standards.

But are there any prospects for foreign producers wishing to enter this market?

Most of China's food is supplied domestically by a large, low-tech, labour-intensive farm sector. Whether this sector will be able to adapt and make the required adjustments in input use and product mix to meet the country's growing and shifting food needs remains to be seen. At present there are some 306-million agricultural labourers and roughly 300-million hectares of cropland area, or about one labourer to a hectare (compared to the US which has some 430-million hectares with approximately 140 labourers per hectare).

The Chinese farm sector thus encompasses over 200-million small-scale household operations using virtually no machinery and a great deal of labour. Most Chinese farmers are predominantly subsistence farmers that grow rice, wheat or corn on small plots of land, maintain a vegetable patch or raise a few head of livestock/chicken. Only occasionally do these small farmers grow cash crops such as cotton, rapeseed, peanuts or tobacco. However, this situation is changing, with the present structure giving way to more commercialised farms. Already production is beginning to shift in order to supply the growing Chinese urban population and its food demands.

China is rapidly emerging as a major player in certain sectors of the fruit and vegetable world markets. Fruit juices, mixed vegetables (not frozen), mushrooms and other frozen vegetables (not potatoes) are the fastest growing sectors, with Japan being the major market for China's processed products, and other nearby Asian countries importing fresh vegetables. However, the fact that China is a net exporter of vegetables does not necessarily mean that there is no potential for exports of vegetables to this market. On the contrary, vegetable imports (for example, cassava) into China have been increasing rapidly, and with increased specialisation and the country's northern latitude location, there may well exist vast opportunities to supply this market as it grows and develops and tariff barriers are lowered One obvious

problem is the fact that lower prices can be fetched on the Chinese wholesale markets. At present, prices in China are far below those of other major markets. This is, of course, a disincentive, but it could be considered a trade-off for the lower quality/marketing grades that are required. Finally, one should not forget that China has a population of more than one billion people whose average incomes are rising rapidly, that vegetables play a large role in their diet and that agricultural land resources are relatively less abundant (in terms of people per km^2) than in certain other countries. These factors spell opportunity, but mainly for certain vegetable varieties.

3.4.2 Japan

Japan's food consumption patterns, although sharing many similarities with the Western developed countries, also have many of its own characteristics. On average, they eat less than other first-world countries in terms of caloric intake; however, they tend to spend more on food, both as a proportion of their budget and in absolute amounts. This reflects the high food prices in Japan, due mainly to government agricultural support systems including price supports and high tariffs, and a demand for a variety of high-quality foods that constitutes a healthy diet.

Vegetables are a particularly important commodity in Japan, and in 2000, the average per capita consumption of vegetables was around 101.9kg per year. Although this figure has been declining in recent years, the value of sales has been rising, which illustrates that higher value forms of vegetables are now being consumed in greater quantities.

For most Japanese, the working day and commuting times are very long, and as such convenience snacks (and stores) are extremely popular, with many stores staying open 24 hours a day. Recent regulatory changes allow for larger retail outlets and longer operating hours, which have resulted in growth in the Japanese supermarket industry.

In terms of production, Japan has many small, privately owned farms, with the majority being on relatively small patches of land (on average 2.18 hectares). These small farms employ some 2.4-million individuals, the majority of whom are over 60. Economies of scale are therefore not likely to exist. As a result, Japanese companies are increasingly contracting outside of the country for various horticultural supplies, whilst the previous system of wholesale markets is rapidly being replaced by supply contracts with individual farmers or groups of farmers.

The production of vegetables is very important to the Japanese farming sector, with fruit and vegetables making up 32% of agricultural production. Such production is, however, limited to temperate vegetables, and during the winter months there is opportunity for exporters from southern hemisphere countries, although covered production negates this somewhat.

Table 13 shows the consumption of commodities that Japan produces in substantial amounts. Many of these vegetables are native to Japan and not found elsewhere, and are consumed in relatively large proportions. The table's obvious limitation is that it does not give an indication of the size of the Japanese market for many other important commodities not produced in Japan, such as tomatoes, potatoes and onions.

Japanese farmers enjoy substantial support from the government in most things agricultural, and this is certainly the case for those growing vegetables. The government has a number of initiatives aimed at supporting farmers and promoting the growing of vegetables, including the development of designated vegetable production areas (often combining the resources of two or more villages), the promotion and financing of greenhouse production, the supply of seeds and seedlings, the subsidising of production capacity (construction), various marketing efforts and the upgrading of current technology/machinery to the latest standards.

These initiatives are often offered as a solution to farmers of more 'traditional' crops, who are increasingly exposed to international competition and/or the economic conditions of excess supply (and prices that are too low to maintain lifestyles or the small size/scale of non-commercial farms). At the same time the Japanese government, under the MAFF, manages various programmes aimed at stabilising the prices of vegetables in the markets. To this end, production targets are set for various regions through co-operative federations/national producer groups (which co-ordinate planting decisions), and any losses/unrealised profits can be recouped through the vegetable supply stabilisation fund (VSSF). What this means for potential exporters of vegetables to Japan is that the sector is heavily controlled and protected, which makes it difficult to enter and directly compete with Japanese producers. Factors that can be influenced to favour local producers most often are, and the authorities will do all in their power to ensure that the domestic market is supplied by the country's own farmers.

Table 13: Japan's consumption of selected vegetables, 2002 (tons)

Komatsuna (similar to turnips)	57,000	Sweet corn	203,800
Qing-gen-cai (Chinese cabbage)	39,700	Kidney beans	35,400
Butterbur	15,800	Broad beans	16,300
Japanese homeworts	17,600	Soybeans	49,900
Shungiku	34,200	Peas	18,400
Asparagus	24,400	Stawberries	183,200
Chinese leeks	56,600	Melons	243,600
Garlic	11,400	Watermelons	415,800
Pumpkin and squash	172,100		

Source: Japanese Ministry for Agriculture, Fishing and Forestry (MAFF)

For SADC producers there are two avenues to explore: off-season produce and/or those vegetables that are not produced in Japan at present. Despite significant control and protection measures, support systems and the bias of local distributors, retailers and customers, imports have been gaining market share recently.

3.5 Africa

Although not much data or many reports on the size of the current or future/potential market for vegetables in Africa are available, it is certainly a market that could become important for vegetable producers in the SADC region. At the moment most of the produce is supplied domestically, and includes significant quantities of 'traditional' vegetables that are consumed as part of a 'traditional' meal, such as cassava, yams and sweet potatoes. However, as Africa begins to grow economically and as incomes start to rise, along with increased labour force participation and urbanisation, one could expect that the volumes of vegetables consumed and the amount spent on purchasing these vegetables will rise. This will be particularly true of processed vegetables, where most growth is likely to occur.

4. International trade in vegetables

4.1 World trends

4.1.1 Major importing regions

As table 14 shows, world imports of vegetables in 2004 were roughly worth $29.5bn, with growth in this cluster of about 10% per annum over the four years to 2004, and 6.2% over the seven years to 2004 (growth was slow between 1997 and 2000, at 1.2% per annum). By far the largest importing region was the EU, accounting for 57% of all imports of vegetables in 2004, or some $16.8bn. Of that, the original 15 member countries (Western Europe), accounted for nearly 96% ($16.1bn). NAFTA was the second-largest market for vegetable exports, with $5.9bn worth of imports in 2004, or 20% of the world vegetable export market. The third and only other significant market was East Asia, with $2.6bn or 8.8%.

Table 14: World imports of vegetables by major importing region, 2004

Importing regions of vegetables	Exporting regions of vegetables (US$m)													%	
Regions	EU 15	EU 10	EU total	NAFTA	East Asia	Africa	South America	South Asia	Central America	Middle East	SADC	Caribbean	World	% share of world imports	% share of trade that is regional
EU 15	12,413	501	12,913	449	221	991	285	54	37	10	78	7	16,123	54.61	81.98
EU 10	506	104	610	9	15	28	1	0	0	0	1	0	725	2.46	14.29
EU total	12,919	605	13,524	459	236	1,019	286	55	37	10	79	7	16,848	57.06	85.19
NAFTA	273	9	281	4,758	136	11	316	39	201	1	1	21	5,919	20.05	79.06
East Asia	52	1	54	384	1,348	1	24	13	2	6	0	-	2,595	8.79	55.84
SAARC	32	0	32	166	50	27	0	165	-	61	21	-	829	2.81	31.83
South America	17	0	17	116	47	2	209	0	1	0	0	0	393	1.33	38.69
Africa	140	2	141	84	46	46	10	17	0	17	24	0	388	1.31	7.81
Middle East	17	1	18	4	6	28	1	27	0	64	0	0	157	0.53	39.90
Central America	1	0	1	20	2	0	3	-	69	-	-	0	96	0.33	46.99
SADC	4	0	5	9	19	26	1	8	0	0	22	0	80	0.27	22.50
Caribbean	5	-	5	14	1	0	0	-	1	0	0	2	23	0.08	12.11
World	14,272	734	15,006	6,122	2,256	1,197	864	379	312	164	134	30	29,526	100.00	
% world exports	48.34	2.49	50.82	20.73	7.64	4.05	2.93	1.28	1.06	0.56	0.45	0.10	100.00		

Source: International Trade Centre (ITC) ComTRADE

The top exporting region was also the EU, accounting for over 50% of world vegetable exports in 2004, or $15bn, followed by NAFTA with $6.1bn (20.7%), East Asia with $2.3bn (7.6%) and Africa with $1.2bn (4%). An important aspect highlighted in table 14 is the regional nature

of trade, with most regions trading the bulk of their total trade in vegetables within the region. For example, the EU imports over 80% of its vegetables from within the EU region. Similarly, 90% of what it exports is destined for EU markets. NAFTA imports about 79% of its vegetables from within the region, and East Asia 56%. The only regions that do not have a high proportion of regional trade are Africa (7%), the Caribbean (12%) and the new accession countries of the EU (14%).

The new EU countries (EU 10) tend to source most of their imports from the other EU countries (EU 15). The reason for the Caribbean's low inter-regional trade in vegetables is because it both exports and imports many of its vegetables to/from the NAFTA countries, principally the US. As for Africa, its main export markets have traditionally been where there is high demand (the EU), which explains most of the low inter-regional trade. Africa's imports from Europe, NAFTA and East Asia are presumably of temperate and/or processed vegetables, hence there may even be opportunities for SADC countries to exploit.

4.1.2 Major importing nations

The top 20 importing nations of vegetables in the world in 2004 are listed in table 15, along with their market share and annual growth rates. The leading country was the US, importing some $4.4bn worth of vegetables, or roughly 14.7% of total world vegetable imports. The US' national market has also been growing relatively fast, at an average annual growth rate of 11.1% per annum over the last four years, and at 9.5% per annum over the last seven years, relative to world growth of 10% and 6.2% respectively over these periods. Growth in vegetable trade for many other countries was relatively slow between 1997 and 2000.

Second on the list and just slightly smaller than the US market was Germany, at $4bn a year, or 13.7% of world imports. Germany has also been growing relatively quickly, at 11%, over the period 2000 to 2004, but had a rather slow growth spell from 1997 to 2000, when vegetable imports into Germany actually declined at an average of 5.8% per year. This means that the country's overall growth, annualised over the period 1997 to 2004, was only 3.5%, which is much slower than the world rate of 6.2%. After Germany, the next biggest market was the UK, importing some $3bn a year, followed by France ($2.1bn), Japan ($1.7bn), the Netherlands ($1.4bn) and Canada ($1.4bn).

Belgium, Italy and Spain, big vegetable exporters themselves, make up the rest of the top 10 importers. In total there are 13 countries from Europe (10 from the EU), three from East Asia and two from North America in the top 20 list of importing nations. This serves to illustrate the size and importance of these three regions as export markets for vegetables. Another important point is that the majority of countries represented in the top 20 showed relatively high annual growth rates

Table 15: Top importers of vegetables by country, 2004 (US$'000)

		Imports	Annual growth (%)			Market share (%)
Rank	Country	2004	97-00	00-04	97-04	
	World	29,525,730	1.2	10.0	6.2	100.0
1	US	4,350,156	7.5	11.1	9.5	14.7
2	Germany	4,045,686	-5.8	11.0	3.5	13.7
3	UK	3,098,455	0.3	13.2	7.4	10.5
4	France	2,154,196	-0.4	12.8	6.9	7.3
5	Japan	1,679,752	3.6	-1.2	0.8	5.7
6	The Netherlands	1,426,263	-3.6	9.8	3.8	4.8
7	Canada	1,361,533	5.6	7.1	6.5	4.6
8	Belgium	1,155,328	-0.5	12.7	6.8	3.9
9	Italy	1,140,963	1.4	13.9	8.4	3.9
10	Spain	1,023,910	3.6	15.4	10.2	3.5
11	Sweden	464,054	-0.4	12.9	7.0	1.6
12	Russian Federation	456,517	-7.0	10.3	2.5	1.5
13	India	435,155	-30.7	39.4	3.3	1.5
14	Switzerland	428,344	-1.3	9.2	4.6	1.5
15	China	397,601	2.6	50.2	27.6	1.3
16	Austria	386,435	-5.4	14.1	5.3	1.3
17	Malaysia	351,917	-4.4	11.4	4.3	1.2
18	Denmark	327,216	-4.7	17.1	7.2	1.1
19	Portugal	256,581	1.6	10.8	6.7	0.9
20	Korea, Rep.	241,149	-7.3	25.9	10.4	0.8
50	South Africa	36,843	-11.4	10.3	0.4	0.1
71	Mauritius	16,820	-7.2	10.0	2.3	0.1

Source: UN Conference on Trade and Development (UNCTAD) World Integrated Trade Solution (WITS) and own calculations

between 2000 to 2004, with only Japan, the Netherlands, Switzerland and Canada below the world average.

Of course the two countries that stand out in this list in terms of growth are India and China. Both are in the process of liberalising their tariff structures and both are trading a lot more in vegetables. India had an annual growth rate of 39% per annum over the four years from 2000 to 2004, while China's was over 50% per year. One potential caveat, however, may be that India's high growth rate probably has more to do with poor harvests, as the period from 1997 to 2000 saw a huge decline in vegetable imports (although more analysis would have to be conducted in this regard).

One country that is not growing its vegetable imports as fast as other commodities is Russia, presumably because its domestic supply can support most of its increasing demand.

The two largest SADC markets for vegetable imports, South Africa and Mauritius, have both seen increases in imports from 2000 to 2004, but decreases from 1997 to 2000. Neither is particularly substantial.

4.1.3 Major imported varieties

The most traded vegetable in the world is tomatoes, with some $4.4bn worth imported worldwide in 2004 (14.9% of all world trade in vegetables).

Table 16: World vegetable imports by variety and region (US$m)

Product	EU 15	EU 10	EU 25	NAFTA	E Asia	S Asia	S Ame	Africa	M East	C Ame	SADC	World	%
Tomatoes	2,541.7	162.3	2,704.0	1,348.1	18.7	2.4	3.2	2.8	6.4	15.1	0.0	4,400.4	14.9
Capsicum and pimenta	1,588.5	112.2	1,700.7	886.8	87.0	1.6	0.6	3.3	2.5	2.9	0.4	2,843.9	9.6
Dried legumes	952.6	34.1	986.8	251.4	198.0	685.5	184.3	198.3	34.4	34.1	52.6	2,749.0	9.3
Onions, garlic, leeks	914.2	64.1	978.2	402.6	208.8	116.8	108.1	36.0	28.4	11.1	5.9	2,322.0	7.9
Potatoes	1,594.7	72.4	1,667.1	148.9	19.4	13.9	21.0	114.3	25.2	10.6	7.4	2,244.2	7.6
Other frozen veg	1,113.6	30.9	1,144.5	364.7	258.0	0.1	1.4	1.3	2.0	0.4	0.6	1,834.8	6.2
Other vegetables	966.1	15.1	981.2	413.3	204.0	1.0	2.4	3.1	29.0	1.3	0.6	1,755.6	5.9
Lettuce and chicory	1,065.5	27.6	1,093.1	292.1	41.4	1.2	0.1	1.4	1.7	1.7	0.1	1,541.2	5.2
Cucumbers and gherkins	761.0	57.5	818.5	415.1	24.3	0.5	0.1	1.6	2.4	0.3	0.0	1,326.3	4.5
Cabbage, cauliflower, broccoli	656.6	41.5	698.1	235.8	174.5	1.4	0.1	1.4	3.2	5.3	0.1	1,274.8	4.3
Mushrooms	804.1	26.3	830.4	88.5	171.2	0.3	0.1	0.8	0.3	1.1	0.5	1,158.0	3.9
Cassava and other tubers	368.4	0.3	368.7	144.8	483.5	0.6	0.6	0.6	1.1	0.5	0.1	1,029.8	3.5
Carrots, turnips, other roots	408.0	31.7	439.7	153.1	109.3	0.8	1.0	2.5	6.0	3.2	0.1	806.2	2.7
Mixed veg, frozen	399.6	15.8	415.3	63.4	171.4	0.8	2.3	3.8	3.1	0.6	1.7	718.7	2.4
Asparagus	269.4	1.9	271.3	288.7	95.9	0.1	0.6	0.3	0.0	0.2	0.2	709.9	2.4
Beans	457.2	0.7	457.9	73.3	6.0	0.4	0.1	0.7	0.7	0.3	0.2	558.3	1.9
Frozen peas	177.9	5.7	183.6	29.8	24.6	0.1	3.5	3.5	1.1	0.1	3.2	274.7	0.9
Frozen beans	158.2	3.8	162.0	41.1	32.0	0.0	0.1	1.4	0.2	0.0	0.7	250.0	0.8
Aubergines (egg-plants)	151.7	4.1	155.8	67.0	3.1	0.3	0.0	4.2	4.7	0.0	0.0	249.7	0.8
Frozen sweet corn	101.7	7.0	108.7	23.2	76.2	0.2	2.7	0.8	0.8	0.3	0.7	231.8	0.8
Frozen potatoes	165.2	2.6	167.8	1.3	8.3	0.2	0.2	1.5	2.9	5.2	0.7	222.4	0.8
Peas	135.8	0.9	136.7	45.2	22.3	0.1	0.5	2.1	0.1	0.2	1.9	218.7	0.7
Frozen legumes, other	35.8	0.4	36.2	8.7	119.5	0.0	0.2	0.1	0.2	0.0	0.1	168.6	0.6
Celery	73.2	1.6	74.8	52.1	9.7	0.1	0.0	0.1	0.1	0.5	0.0	148.3	0.5
Frozen spinach	91.5	3.7	95.2	13.2	21.8	0.1	0.4	0.1	0.1	0.0	0.1	137.5	0.5
Olives	28.0	0.3	28.3	13.8	0.4	0.2	56.3	1.2	0.2	0.3	0.9	122.1	0.4
Spinach	42.7	0.5	43.2	44.2	0.8	0.1	0.0	0.1	0.0	0.1	0.0	95.5	0.3
Artichokes	52.0	0.1	52.1	3.8	0.2	0.0	0.1	0.2	0.3	0.0	0.0	60.1	0.2
Other legumes	28.5	0.1	28.6	3.9	4.3	0.0	0.0	0.7	0.3	0.5	0.7	44.2	0.1
Capers	19.9	0.1	20.0	0.8	0.4	0.0	3.0	0.1	-	0.1	0.0	28.2	0.1
Total vegetables	16,123.3	725.1	16,848.4	5,918.7	2,594.8	828.8	393.1	388.1	157.3	96.0	79.6	29,524.8	100.0
% of world total	54.6	2.5	57.1	20.0	8.8	2.8	1.3	1.3	0.5	0.3	0.3	100.0	

Source: Unctad WITS and own calculations

Second on the list of the most traded vegetable varieties is the group including capsicum and pimenta (sweet and chilli peppers, cayenne peppers, paprika, etc.), which accounted for $2.8bn (9.6%) of world trade. Third was dried legumes at $2.7bn (9.3%). Onions, shallots, garlic and leeks followed with $2.3bn (7.9%), potatoes (not frozen) with $2.2bn (7.6%) and other frozen vegetables with $1.8bn (6.2%).

Table 16 also shows the quantities of various vegetable varieties imported in 2004 by region. Whereas the EU's main imports tend to be tomatoes, capsicum, potatoes, lettuce and other frozen vegetables, South Asia tends to import predominantly dried legumes, onions, garlic

Table 17: Fastest growing vegetable varieties

	Annual growth, 2000-2004 (%)				Annual growth, 1996-2004 (%)			
Product	**East Asia**	**EU 25**	**NAFTA**	**World**	**East Asia**	**EU 25**	**NAFTA**	**World**
Spinach	24.7	20.2	21.5	20.3	4.3	11.5	17.8	14.6
Beans	2.8	19.2	8.6	16.1	-2.4	10.0	6.0	9.2
Aubergines (egg-plants)	-9.4	17.9	16.2	15.7	16.1	6.3	12.0	8.5
Capsicum and pimenta	6.1	16.1	9.9	13.7	15.1	8.1	13.2	10.1
Onions, shallots, garlic, leeks	8.8	19.8	11.2	13.2	3.5	6.6	5.7	9.2
Cassava and other vegetables, tubers	37.5	1.8	8.3	13.1	11.0	-6.0	6.1	1.5
Potatoes	11.2	19.1	-2.6	12.8	13.4	3.7	-1.7	5.1
Other frozen vegetables	11.5	14.2	10.7	12.7	9.4	6.2	7.7	7.0
Other vegetables	3.1	19.2	9.6	12.6	2.2	8.4	10.0	8.4
Frozen beans	-3.1	15.4	18.6	11.0	-2.3	4.6	22.7	5.3
Lettuce and chicory	1.4	13.1	9.0	11.0	-0.5	3.3	9.4	4.2
Cucumbers and gherkins	-7.8	8.7	16.2	10.4	-6.5	2.2	11.5	4.6
Carrots, turnips, other vegetables, roots	4.9	13.8	8.2	9.4	14.9	1.0	8.4	5.3
Tomatoes	-11.5	8.6	11.0	8.9	12.8	3.5	5.6	4.8
Mushrooms	-8.7	14.1	12.1	8.8	-4.5	7.1	19.1	5.1
Cabbages, cauliflowers, broccoli	-0.9	14.0	8.0	8.5	1.2	2.1	8.8	4.1
Asparagus	-5.3	11.2	12.7	8.2	-2.3	2.1	15.6	5.0
Peas	-13.3	13.7	13.3	7.2	-3.1	9.5	10.4	7.8
Olives	11.1	23.9	-0.2	6.8	19.5	13.8	4.5	19.5
Artichokes	9.3	7.9	0.9	6.7	-1.8	2.4	-1.0	2.1
Frozen peas	-5.3	9.0	6.9	6.6	-1.0	2.3	5.2	3.2
Dried legumes	1.5	4.5	4.9	6.2	-0.3	-1.7	2.8	3.2
Frozen spinach	-15.5	16.5	20.5	6.1	-1.8	4.9	15.6	4.4
Other vegetables legumes	-15.5	14.8	-7.1	5.0	-10.9	6.8	-3.7	3.6
Celery	-11.1	12.6	-0.7	4.4	-6.7	4.8	6.1	4.7
Mixed vegetables frozen	-3.6	12.0	6.1	3.8	-5.2	6.8	10.6	3.4
Frozen sweet corn	-0.6	7.3	11.7	3.4	2.1	2.4	9.7	3.3
Frozen legumes other	-2.4	18.9	8.9	1.5	0.8	3.3	5.0	1.8
Capers	2.7	-1.2	-24.8	1.0	-10.6	-2.3	-17.3	-1.5
Frozen potatoes	-28.6	11.5	-24.1	0.6	-12.5	10.3	-14.5	8.0

Source: Unctad WITS and own calculations

and leeks. East Asia's biggest imports include cassava; other frozen vegetables; onions, shallots, garlic and leeks; dried legumes; mushrooms; mixed frozen vegetables and other vegetables, while NAFTA is the world's biggest importer of asparagus and spinach. South America imports far more olives than any other region, whilst the major imported varieties for Africa, the Middle East and Central America are dried legumes; onions, garlic, shallots and leeks; and potatoes.

While table 16 gives one an idea of which varieties are currently being exported in the greatest quantities, table 17 highlights which varieties have grown most in the major world markets. The fastest growing variety in the world for the period 2000 to 2004 was spinach, which grew at an annual rate of 20% per annum worldwide, at 25% in East Asian imports, at 20% in EU imports and at 22% in NAFTA imports. Other fast-growing varieties included beans, aubergines, capsicum and pimenta, and onions. Frozen potatoes had the slowest growth rate at 0.6% worldwide, with a declining rate in East Asia and NAFTA. Over the longer, eight-year period from 1996 to 2004, olives grew the fastest at just under 20% per year, followed by spinach and capsicum. Certain commodities did really well in some regions but less so in others, like frozen beans, which grew on average by 23% per year in the US, but declined by 2.3% per annum in East Asia.

4.1.4 Major exporters of vegetables

Spain is the biggest exporter of vegetables in the world, exporting over $4.4bn worth of produce a year, and accounting for 15.2% of the world export market (see table 18). Second is the Netherlands with 13.6% of the export market, followed by Mexico (9.6%), China (6.9%) and the US (5.8%). France, Canada, Belgium, Italy and Thailand make up the top 10. Unlike the world's biggest importers of vegetables, the top 20 exporters are drawn from a number of regions, including South America (Peru and Argentina), the Middle East (Israel and Turkey), Africa (Morocco), Oceania (New Zealand) and Asia (Thailand, China and India). In Southern Africa, South Africa is the 45th-largest exporter of vegetables in the world, Tanzania the 60th, Zimbabwe the 70th and Zambia the 73rd-largest exporter. Together these four countries account for just 0.5% of world exports.

As in the case of fruit, most vegetable exporters tend to trade with markets in close proximity, and for most regions, inter-regional trade plays a significant role in trade determination. Thus, whilst Mexico, Peru, Canada and Argentina all export significant quantities to the North American markets – predominantly the US – Israel, Turkey, Morocco and the European countries tend to export to the EU markets. Similarly, China and Thailand target the Japanese market, as does New Zealand. In terms of growth, the countries on this list have experienced mixed fortunes of late, with Israel, Poland, Morocco and Peru all growing their exports more than 20% per year from 2000 to 2004, while countries such as the US, Argentina and New Zealand have been struggling.

Table 18: Top exporters of vegetables by country, 2004 (US$'000)

		Exports	Annual growth (%)			Market share (%)
	Country	2004	97-00	00-04	97-04	
	World	29,525,730	1.2	10.0	6.2	100.0
1	Spain	4,476,948	-1.1	11.4	5.9	15.2
2	The Netherlands	4,013,747	-1.3	9.7	4.8	13.6
3	Mexico	2,847,358	5.0	10.4	8.1	9.6
4	China	2,045,660	5.7	7.4	6.7	6.9
5	US	1,712,183	3.0	-0.9	0.8	5.8
6	France	1,701,075	-2.3	13.7	6.5	5.8
7	Canada	1,562,231	14.8	7.4	10.5	5.3
8	Belgium	1,446,511	0.2	14.2	8.0	4.9
9	Italy	977,828	-8.5	11.6	2.5	3.3
10	Thailand	772,994	-0.8	14.2	7.5	2.6
11	Germany	693,156	7.9	19.7	14.5	2.3
12	Morocco	493,368	4.4	20.0	13.0	1.7
13	Israel	465,848	2.4	27.2	15.9	1.6
14	Poland	448,472	9.6	24.0	17.6	1.5
15	Peru	341,916	20.5	21.3	21.0	1.2
16	Turkey	329,447	-13.1	19.0	4.0	1.1
17	India	309,898	26.1	12.2	17.9	1.0
18	UK	287,147	-5.6	10.7	3.4	1.0
19	Argentina	284,184	-15.3	3.3	-5.1	1.0
20	New Zealand	283,950	3.0	4.7	4.0	1.0
45	South Africa	46,725	27.2	-5.3	7.5	0.2
60	Tanzania	28,979	-12.1	62.1	24.7	0.1
70	Zimbabwe	19,333	0.5	-5.5	-3.0	0.1
73	Zambia	17,402	-3.3	19.0	8.9	0.1
96	Malawi	6,646	-4.3	22.5	10.2	0.0
98	Madagascar	5,986	-16.6	1.8	-6.5	0.0
101	Mozambique	5,398	16.5	36.1	27.3	0.0

Source: Unctad WITS and own calculations

SADC countries have shown erratic growth for the period under review, although some countries in the region seem to have a particularly positive outlook. If the analysis is based on the period 2000 to 2004, Tanzania's growth rate of 62% per year, Mozambique's 36% and Malawi's 22.5% give reason to be optimistic about the region's export opportunities in the vegetable sector. South Africa's declining exports could be explained by the pressures of a stronger rand, and possibly more importantly, growth in domestic demand.

A very important difference between countries lies in the basket of commodities each exports, or in which particular vegetable varieties they have some level of comparative advantage. In fruit the dividing lines were clear for the most part: bananas came from the South American countries and citrus fruits from the Mediterranean, with most of the product mix depending on the exporting country's climate. With vegeta-

bles, determination of the product mix is slightly different, with factors such as traditional domestic markets playing a much larger role in determining in which varieties a country enjoys a comparative advantage. This could have much to do with economies of scale based on external economies, and/or product knowledge and learning by doing.

Exports by region for selected products are shown in table 19. Africa for example, exported some $222m worth of tomatoes in 2004, accounting for roughly 18.6% of all exports from that region, although the bulk of these tomato exports came from the African vegetable champion, Morocco. Africa also exported $151m of potatoes, which was 12.6% of total exports, and $128m of other vegetables (10.7%). Nearly 40% of South Asia's exports, 25.7% of South America's exports and 20.2% of East Asia's exports in value terms were onions, shallots, garlic and leeks. 52% of the Middle East's exports were dried legumes, whilst 30.2% of South America's exports were asparagus (Peru). For the SADC countries, 36.6% of all exports were dried legumes, 11.5% peas and 14.3% other vegetables (those not falling into any other category).

In terms of individual countries, Spain, the leading world exporter of vegetables, exported $1.2bn worth of tomatoes in 2004 – 15 times the value of all vegetables exported from the entire SADC region to anywhere in the world, or three times the total vegetable exports of the entire African continent. Tomato exports accounted for only 26% of Spain's total vegetable exports, with roughly one-quarter going to the UK, one-quarter to Germany (23%) and one-eighth to France and the Netherlands each. Spain's second-biggest export was capsicum and pimenta, at $764m, or 17% of its total exports. One-third of these exports was destined for Germany and one-sixth for France. Lettuce was Spain's next biggest export, followed by cucumbers and gherkins, and cabbages, broccoli and cauliflower. The majority of all its produce was destined for European countries.

Spain's biggest non-European export market was the US, which imported some $27m worth of vegetables, with 40% of this being capsicum and pimenta. The Netherlands, the second-biggest exporter of vegetables in the world, acts a 'clearing house' for various markets in Europe (and Eastern Europe), and also for various products destined for the US, as the country both exports and imports large quantities of vegetables. The Netherlands' biggest exports were tomatoes, capsicum and pimento, potatoes, cucumbers, onions and mushrooms, in this order. The majority of the country's exports went to Germany (31%), the UK (20%), Belgium (10%), France (5%), and Sweden (5%). Unsurprisingly, Mexico, the third-biggest vegetable exporter in the world, exported most of its produce to the US (88%), followed by Canada (1.5%). Its main export products were tomatoes, capsicum and pimento, cucumbers and gherkins and 'other vegetables'.

Likewise, 40% of Chinese vegetable exports were destined for Japan and a further 20% for Korea, Malaysia and Hong Kong combined. China also exported about $106m worth of vegetables to the

Table 19: World exports of vegetables by variety and region, 2004 (%)

Product	EU 15	EU 10	EU 25	NAFTA	E Asia	Africa	S Ame	S Asia	C Ame	M East	SADC	World
Tomatoes	18.3	4.0	17.6	20.7	1.1	18.6	0.5	0.5	5.1	8.7	0.8	14.9
Capsicum & pimenta	11.8	4.6	11.4	11.5	3.0	4.2	0.2	2.1	1.5	2.3	2.1	9.6
Dried legumes	2.5	3.8	2.5	16.9	12.8	9.2	16.2	34.3	10.1	52.2	36.6	9.3
Onions, garlic, leeks	5.6	6.1	5.6	5.4	20.2	3.4	25.7	40.2	2.1	7.5	7.3	7.9
Potatoes	10.9	9.0	10.8	3.0	1.2	12.6	1.7	3.0	2.3	5.8	2.8	7.6
Other frozen veg	5.8	19.9	6.4	4.0	13.6	1.8	10.1	1.2	17.8	0.6	3.6	6.2
Other vegetables	5.5	1.2	5.3	6.5	4.8	10.7	1.2	9.4	10.8	3.8	14.3	5.9
Mushrooms	4.0	26.7	5.1	1.7	7.2	0.5	0.1	0.0	0.0	0.2	2.6	3.9
Cassava	0.5	0.0	0.4	0.5	4.4	2.0	2.3	0.4	25.3	0.0	1.9	3.5
Asparagus	1.4	1.7	1.5	2.4	0.0	0.3	30.2	0.0	0.3	0.1	0.5	2.4
Peas	0.4	0.1	0.4	0.3	1.3	5.2	1.4	0.1	11.0	0.2	11.5	0.7
Olives	0.4	0.0	0.4	0.0	0.0	0.3	6.3	0.0	0.0	0.0	0.1	0.4
% of total exports	67.0	77.0	67.5	72.9	69.7	68.9	95.9	91.3	86.2	81.4	84.1	72.4

Source: UNCTAD WITS and own calculations

US and $74m to Russia. Roughly 22% of all Chinese exports were onions, shallots and leeks, with most of these finding their way to Japan (30%), Indonesia, the US, Malaysia and Russia. China also has a massive export industry in frozen vegetables, with 'other frozen vegetables' accounting for $304m, 'frozen legumes' for $105m, and 'mixed frozen vegetables' for $41m. The majority of these exports were destined for the Japanese market (56%). Other major varieties included dried legumes; mushrooms; cabbages, broccoli and cauliflower; and other provisionally preserved products.

The US' biggest export is lettuce, most of which goes to Canada, followed by cabbages and cauliflower, of which Canada and Japan were the major recipients, and dried legumes and tomatoes (again, the bulk went to Canada). The US also supplies Japan and China with sweet corn, Switzerland with asparagus (even though the US is a net importer of asparagus, mainly from Peru), Malaysia with frozen potatoes, and the UK with a variety of vegetables. France, a large producer of potatoes, lettuce and a wide array of other vegetables, supplies the European market almost exclusively, as does Morocco, with tomatoes and beans. India exports a significant quantity of onions and shallots to Bangladesh, Malaysia and Sri Lanka, and dried legumes to Bangladesh, China and the US. Thailand is the world's biggest exporter of cassava. China, its neighbour, is the biggest importer.

From the above data and analysis it is clear that proximity to markets has a large impact on the level of trade in vegetables, and that supply routes are well established and competitive. This emphasises the fact that should SADC countries wish to export to the major markets and compete with other world exporters, they will have to do so in the off-seasons. There seems to be little prospect of competing during the main harvest seasons. An important consideration is, however, the effects that the latest round of WTO trade talks will have on the competitiveness of European and other developed country farmers. With a

reduction in subsidies it may even become possible to compete directly in the large EU markets. Morocco, for example, could be a potential role model in the export of tomatoes by capturing a substantial share of this lucrative market.

4.2 The European Union

4.2.1 Top importing countries of the EU

The EU, with nearly $17bn worth of imports in total, relatively high prices paid for produce of a certain standard and high growth rates in vegetable consumption and importation, must surely be one of the most attractive markets for potential exporters. Germany, the UK, France, the Netherlands, Belgium, Italy and Spain are all major importers of vegetables, with imports of over $1bn in 2004 (see table 20). Only one country in the EU25 had a growth rate of less than 10% per annum for vegetable imports in the four years to 2004. With the Doha

Table 20: Top importing countries of the EU, (US$'000)

		Imports	Annual growth (%)			Market share (%)
Rank	**Country**	**2004**	**00-04**	**96-00**	**96-04**	
	EU	16,796,266	12.8	-0.5	6.0	100.0
1	Germany	4,040,832	11.0	-6.3	2.0	24.1
2	UK	3,098,294	13.2	2.0	7.5	18.4
3	France	2,138,846	12.8	0.7	6.5	12.7
4	The Netherlands	1,423,277	9.7	-5.9	1.6	8.5
5	Belgium	1,152,344	12.6	-	-	6.9
6	Italy	1,124,891	13.9	-0.6	6.4	6.7
7	Spain	1,023,766	15.4	0.2	7.5	6.1
8	Sweden	463,986	12.9	-3.2	4.5	2.8
9	Austria	385,522	14.1	-6.5	3.3	2.3
10	Denmark	327,200	17.1	5.4	11.1	1.9
11	Portugal	256,544	10.8	-1.6	4.4	1.5
12	Greece	209,983	24.0	-3.8	9.2	1.3
13	Czech Republic	209,876	17.5	-4.6	5.8	1.2
14	Ireland	206,309	12.5	-3.3	4.3	1.2
15	Poland	176,128	16.8	18.9	17.9	1.0
16	Finland	157,764	13.8	-4.2	4.4	0.9
17	Hungary	80,773	40.5	10.9	24.8	0.5
18	Luxembourg	66,271	14.4	-	-	0.4
19	Slovak Republic	64,129	28.8	-	-	0.4
20	Slovenia	63,896	14.1	-7.0	3.0	0.4
21	Lithuania	50,807	18.8	-	-	0.3
22	Latvia	31,521	14.2	-	-	0.2
23	Estonia	19,355	14.4	12.7	13.6	0.1
24	Cyprus	14,344	14.3	-4.1	4.7	0.1
25	Malta	9,608	20.2	-3.3	7.8	0.1

Source: UNCTAD WITS and own calculations

Development Round of WTO negotiations possibly paving the wave for the abolition of agricultural subsidies, exporters and farmers considering production of 'exportable' vegetable varieties should be able to gain a share of this massive market.

4.2.2 Top exporting countries to the EU

Of the $17bn a year in imports, the original 15 EU members currently import the lion's share (96%). The majority of imports are sourced from within the region, with Spain the largest and the Netherlands the second-largest exporter to the EU markets (although much of the Netherlands' exports are re-exports, as noted earlier). France, Belgium, Italy and Germany are also big players, and intra-regional trade therefore accounts for roughly 80.3% of all trade in vegetables in the EU.

When intra-regional trade is excluded, Morocco is the leading vegetable exporter to the EU, with $464m in 2004, or 13.9% of all extra-EU trade (see table 22). Israel is second, followed by Canada, Thailand, China and Turkey. Egypt has managed to grow its exports to the EU by over 30% per year in the four years to 2004, and is now the seventh-biggest exporter to the region. Egypt is also looking to capture as much of the emerging eastern European market as possible, growing its exports to these countries by 75% per year. In Africa, Kenya has seen positive growth figures of late. South Africa is the highest-ranked SADC country at number 22 on the list of extra-EU exporters and has seen good growth from 2000 to 2004, but a disappointing declining growth rate in the three years prior to that. At present, Tanzania is the

Table 21: Top exporting countries to the EU

		Imports 2004 (US$m)			Annual growth, 2000-2004			Annual growth (%)		Market share (%)
Rank	Country	EU 15	EU 10	Total	EU 10	EU 15	Total	97-00	00-04	
	World	16,123	725	16,848	12.5	19.0	12.8	-1.8	6.3	100.0
1	Spain	4,028	186	4,215	11.6	19.6	11.9	-1.6	5.9	25.0
2	The Netherlands	3,359	141	3,500	11.4	20.3	11.7	-2.7	5.3	20.8
3	France	1,507	22	1,529	13.8	17.6	13.9	-2.3	6.6	9.1
4	Belgium	1,314	26	1,340	15.2	9.2	15.1	0.4	8.5	8.0
5	Italy	772	66	838	11.2	20.0	11.8	-9.0	2.4	5.0
6	Germany	626	41	667	20.2	32.4	20.8	7.2	14.7	4.0
7	Morocco	441	23	464	20.0	42.3	20.7	5.2	13.8	2.8
8	Poland	300	54	354	27.9	24.0	27.2	6.9	18.1	2.1
9	Israel	349	4	353	28.9	80.5	29.2	2.4	16.9	2.1
10	Canada	298	8	306	3.2	0.7	3.1	11.9	6.8	1.8
11	Thailand	284	1	284	-1.7	36.8	-1.6	0.7	-0.6	1.7
12	UK	245	4	248	12.7	13.6	12.7	-8.3	3.2	1.5
13	China	220	15	235	9.3	15.3	9.7	4.4	7.4	1.4
14	Turkey	200	7	207	18.6	34.6	19.0	-10.3	5.4	1.2
15	Egypt, Arab Rep.	196	2	198	31.6	75.3	31.9	-9.8	12.1	1.2

Source: UNCTAD WITS and own calculations

Table 22: Top extra-EU exporters of vegetables to the EU

Top 10 Extra-EU exporters		2004 imports (US$m)			Annual growth, 00-04 (%)			Annual growth (%)		Market share (%)
Rank	Country	EU 15	EU 10	Total	EU 10	EU 15	Total	97-00	97-04	
	World	**16,123**	**725**	**16,848**	**12.5**	**19.0**	**12.8**	**-1.8**	**6.3**	**100.0**
	Intra-regional trade	**12,913**	**610**	**13,524**	**12.8**	**18.8**	**13.0**	**-2.4**	**6.2**	**80.3**
	Extra-regional trade	**3,210**	**115**	**3,325**	**11.6**	**20.3**	**11.8**	**0.3**	**6.7**	**19.7**
1	Morocco	441	23	464	20.0	42.3	20.7	5.2	13.8	13.9
2	Israel	349	4	353	28.9	80.5	29.2	2.4	16.9	10.6
3	Canada	298	8	306	3.2	0.7	3.1	11.9	6.8	9.2
4	Thailand	284	1	284	-1.7	36.8	-1.6	0.7	-0.6	8.6
5	China	220	15	235	9.3	15.3	9.7	4.4	7.4	7.1
6	Turkey	200	7	207	18.6	34.6	19.0	-10.3	5.4	6.2
7	Egypt, Arab Rep.	196	2	198	31.6	75.3	31.9	-9.8	12.1	6.0
8	Kenya	185	0	185	11.0	81.2	11.0	12.7	11.7	5.6
9	Argentina	107	0	108	7.1	-4.6	7.0	-1.1	3.5	3.2
10	US	97	2	99	-8.0	-4.4	-7.9	-8.8	-8.3	3.0
Selected other countries										
11	Peru	90	0	90	25.0	16.9	25.0	7.9	17.4	2.7
15	Chile	46	0	46	27.0	80.5	27.1	-5.1	12.1	1.4
17	Bulgaria	33	3	36	36.2	12.8	33.4	-10.0	12.7	1.1
18	Romania	33	1	34	27.3	7.0	26.2	-12.9	7.7	1.0
22	South Africa	24	0	24	24.0	21.6	24.0	-20.1	2.8	0.7
28	Zambia	17	-	17	19.2	-	19.2	-2.8	9.2	0.5
32	Zimbabwe	15	0	15	-6.9	-14.1	-6.9	-1.1	-4.4	0.5
33	Tanzania	13	1	14	56.2	234.8	58.4	-27.5	13.3	0.4

Source: UNCTAD WITS and own calculations

country showing the most promise, growing at an unbelievable 56% per year in western EU countries and 235% per year in the eastern EU countries. It too, however, experienced negative growth in the period 1997 to 2000.

One potentially worrying fact that may be gleaned from the data is that inter-regional trade is growing at a faster rate than extra-regional trade, which means that many exporters outside of the EU are losing market share. However, the total amount of trade with extra-regional countries is increasing at a strong rate (11.8%), and of the countries represented in table 22, the African countries are doing relatively well.

4.2.3 Products exported to the EU

Table 23 shows which varieties of vegetables are being imported into the EU from countries within and outside of the EU. Intra-EU trade dominates for a number of varieties, including lettuce, frozen potatoes, cabbages, cauliflower, broccoli, spinach (fresh and frozen), carrots, aubergines, celery, cucumbers and gherkins. At this point it would seem that there are few prospects for entering this market, at least not during peak seasons (and entry will critically depend on the storage time of the

particular vegetable considered). Vegetables predominantly imported from abroad include cassava, which has an extra-EU penetration ratio of 82%, dried legumes (70%), beans (68%), peas (58%) and asparagus (30%). The countries on the list of leading extra-EU exporters to the region include the African countries of Morocco, Kenya, and Egypt. Opportunity seems to exist for extra-EU imports of vegetables like tomatoes, long known as the most heavily subsidised (after olives) of the vegetable products in Europe; Morocco, for example, has enjoyed increased market access in this commodity. 6.8% of the $2.7bn EU market for tomatoes represents a sizeable sum of foreign revenue for Morocco, as does 27.9% of the $458m market for beans.

The only SADC countries to appear on the list are Zambia, with 5% of the peas market, and South Africa, with 0.3% of the cabbages, cauliflower and broccoli market and 0.3% of the carrots market.

Table 23: EU imports of vegetables by product and region (US$m)

Product	EU 25	Intra-EU	Extra-EU	% extra-EU share	Leading extra-EU exporters (% share)			% world share
					1st	2nd	3rd	
Cassava, etc.	369	65	304	82.4	Thailand 63%	Israel 3.6%	Costa Rica 3.3%	35.8
Dried legumes	987	295	692	70.1	Canada 30%	China 7.8%	USA 6.6%	35.9
Beans	458	143	315	68.8	Morocco 27.9%	Kenya 22.0%	Egypt 9.7%	82.0
Peas	137	57	80	58.3	Kenya 27%	Guatemala 11.6%	Zambia 5.2%	62.5
Asparagus	271	190	81	30.0	Peru 24.2%	Thailand 2.2%	Morocco 0.8%	38.2
Onions, etc.	978	718	260	26.6	Argentina 6.0%	New Zealand 5.1%	China 3.0%	42.1
Other vegetables	981	740	241	24.6	Morocco 4.6%	Kenya 3.7%	Thailand 3.5%	55.9
Frozen mixed veg	1,560	1,179	381	24.4	China 4.9%	Turkey 4.3%	Ecuador 1.5%	61.1
Other legumes	29	23	6	19.6	Morocco 4.0%	Kenya 2.6%	Thailand 1.7%	64.8
Potatoes	1,667	1,390	277	16.6	Israel 7.9%	Egypt 6.1%	Morocco 1.8%	74.3
Sweet corn	109	91	18	16.3	Israel 8.2%	Thailand 2.3%	Canada 1.7%	46.9
Mushrooms	830	714	116	14.0	Russia 3.2%	Belarus 2.6%	Romania 2.3%	71.7
Capsicum & pimenta	1,701	1,486	214	12.6	Israel 7.1%	Morocco 2.2%	Turkey 2.0%	59.8
Artichokes	52	46	6	11.7	Egypt 10.7%	-	-	86.7
Tomatoes	2,704	2,444	259	9.6	Morocco 6.8%	Israel 1.2%	Turkey 0.8%	61.4
Frozen legumes	382	357	25	6.5	China 2.6%	Kenya 0.7%	Morocco 0.6%	55.1
Cucumbers & gherkins	818	776	42	5.2	Turkey 0.6%	Bulgaria 0.5%	Morocco 0.4%	61.7
Celery	75	71	4	5.0	Israel 4.8%	Turkey 0.2%	USA 0.1%	50.4
Aubergines	156	149	7	4.3	Turkey 2.2%	Kenya 1.0%	Thailand 0.4%	62.4
Carrots, etc.	440	427	13	2.9	Israel 0.8%	South Africa 0.3%	Turkey 0.3%	54.5
Spinach	43	42	1	2.8	USA 0.8%	-	-	45.2
Frozen spinach	95	93	2	2.4	China 0.8%	Macedonia 0.4%	Argentina 0.3%	69.3
Cabbages, etc.	698	686	12	1.7	South Africa 0.3%	Kenya 0.2%	Monaco 0.2%	54.8
Frozen potatoes	168	165	3	1.7	China 0.4%	Monaco 0.4%	USA 0.4%	75.4
Lettuce	1,093	1,085	8	0.7	USA 0.1%	Morocco 0.1%	Chile 0.1%	70.9
Total vegetables	16,848	13,481	3,367	20.0	Morocco 2.8%	Israel 2.1%	Canada 1.8%	57.1

Source: UNCTAD WITS and own calculations

4.3 The NAFTA region

4.3.1 Exports and imports

The NAFTA region is a major producer, exporter and importer of vegetables. Since most tariffs and quantitative restrictions in horticultural products between the US, Canada and Mexico have been eliminated in a phase-out period from 1998 to 2003, the North American region has seen a large increase in trade in vegetables. In terms of exports, most of Mexico's (roughly 88%) and about 55% of Canada's vegetable exports are destined for the US market, whilst Mexico (3rd), the US (5th) and Canada (7th) are all on the top 10 list of the world's biggest vegetable exporters.

Roughly two-thirds of the US's annual $1.7bn worth of vegetable exports can be classified as intra-NAFTA trade (predominantly with Canada, at 60%). Intra-NAFTA trade accounts for about 80% of all imports into the region, with the US the biggest source of imports to Canada and Mexico. Similarly, the US is the primary destination for Mexican (the largest source of imports to the US) and Canadian (the second-largest) exports. Extra-NAFTA trade accounts for $1.1bn, with most of this trade coming from the South and Central American and Caribbean countries.

Table 24 illustrates the major sources of imports for the North American market. As a country, the US is the world's biggest importer of vegetables (at $4.3bn or 14.7% of the world market), while NAFTA (as a region) is the world's second-biggest importer (at $5.9bn or 20% of total world imports of vegetables). Needless to say it is an important potential destination for any exporting country desiring to enter the global vegetable market. US imports of vegetables, which have been growing at 11% per annum from 2000 to 2004, are driving the growth in the entire NAFTA region, as US imports make up 74% of that of the entire region. The US has high growth expectations for vegetables up to 2020, and this, coupled with increasing penetration ratios, makes the US market attractive for potential exporters.

Mexico has had slow growth in imports (at 4.3% per annum) but rather rapid growth in exports (11%), indicating increased production levels and the ability to supply its own domestic market along with other export markers. Canada has experienced modest growth in this sector.

In terms of export growth, Mexico has grown its exports to Canada significantly, as has Peru (primarily asparagus), Israel, Costa Rica, New Zealand and the Philippines. Mexico's relatively small import market has seen growth from Guatemala, Peru, Belgium and New Zealand, whilst the giant US market has registered strong growth from Peru (asparagus), China (frozen vegetables), Israel, Ecuador, New Zealand (spinach), Poland and Pakistan. The most successful countries exporting to NAFTA over the past four years have been Poland, New Zealand, the Philippines, Pakistan and Ecuador. South Africa, the only SADC

Table 24: NAFTA imports of vegetables, 2004

		Imports 2004 (US$m)				Annual growth, 00-04 (%)				Annual growth (%)		Market share (%)
Rank		**Can**	**Mex**	**US**	**NAFTA**	**Can**	**Mex**	**US**	**NAFTA**	**96-00**	**96-04**	
	The World	1,361	207	4,350	5,918	7.1	4.3	11.1	9.9	6.4	8.1	100.0
	Intra-NAFTA	1,204	187	3,367	4,758	1.0	3.8	11.5	9.8	5.8	7.8	80.4
	Extra-NAFTA	157	20	983	1,160	2.0	8.9	9.9	10.2	9.2	9.7	19.6
1	Mexico	195	-	2,527	2,722	24.3	-	11.0	11.8	3.0	7.3	46.0
2	US	1,009	166	-	1,176	4.3	3.9	-	4.3	6.6	5.4	19.9
3	Canada	-	21	840	860	-	3.1	12.9	12.6	16.1	14.3	14.5
4	Peru	17	1	214	232	34.1	18.6	22.5	23.2	22.0	22.6	3.9
5	The Netherlands	22	0	136	159	7.6	-27.7	-4.5	-3.2	2.7	-0.3	2.7
6	China	21	1	106	128	10.9	-19.3	34.8	27.7	5.7	16.2	2.2
7	Israel	6	-	83	89	26.2	-	22.9	23.1	14.9	18.9	1.5
8	Guatemala	6	2	71	80	7.9	54.1	9.8	10.3	6.9	8.6	1.3
9	Costa Rica	3	-	75	78	22.1	-	6.2	6.6	0.5	3.5	1.3
10	Spain	26	1	28	55	5.6	-15.9	-6.6	-1.8	24.2	10.4	0.9
11	India	5	0	31	37	8.6	-	-8.9	-7.1	45.3	16.1	0.6
12	Belgium	7	1	24	33	10.0	18.7	18.0	16.0	-	-	0.6
13	Chile	2	8	23	33	15.2	7.5	3.3	4.8	15.0	9.8	0.6
14	Ecuador	0	-	27	28	-25.4	-	46.8	44.3	8.6	25.2	0.5
15	Dominican Republic	3	-	23	26	14.4	-	2.5	3.6	2.3	2.9	0.4
21	New Zealand	1	0	10	11	66.2	51.5	46.4	47.6	-0.8	21.0	0.2
	Selected countries											
24	Poland	1	-	8	9	14.8	-	90.2	70.1	5.6	34.0	0.1
25	Thailand	2	0	4	7	18.6	17.8	2.3	7.0	-4.1	1.3	0.1
28	Philippines	5	-	1	5	89.6	-	1.7	54.0	1.9	25.3	0.1
44	South Africa	0	-	1	1	-10.1	-	19.4	18.9	39.5	28.7	0.0
46	Pakistan	0	-	1	1	34.5	-	58.2	48.8	37.5	43.1	0.0

Source: UNCTAD WITS and own calculations

country with any significant exports to the NAFTA region, has exhibited strong growth of 28% per annum over the last eight years, with growth in the US markets achieved at the expense of the Canadian markets.

Table 25 shows the value of different varieties imported into the NAFTA region during 2004, the average annual growth rates from 2000 to 2004 and the respective shares of each variety for NAFTA countries (intra-NAFTA) and for those from outside the region (extra-NAFTA). Countries outside of the region have gained large market shares in varieties such as cassava (88% or $128m), vegetables provisionally preserved (88% or $29m), other legumes (74% or $3m), asparagus (64% or $185m), peas (64% or $29m) and frozen legumes (56% or $45m). Although the percentage share for varieties such as capsicum and pimenta ($188m), frozen mixed vegetables ($147m) and onions ($120m) is lower, the actual values of exports are high.

The second point to note is in which products the extra-NAFTA share of the market has been growing (and where it has been growing

faster than intra-NAFTA growth). Thanks to China, frozen spinach has enjoyed the fastest growth), followed by sweet corn (Peru) and aubergines (Honduras). But all three of these are relatively small markets and thus the growth in actual value of exports is not that high. More importantly, growth has occurred in frozen mixed vegetables, onions, asparagus and to a lesser extent in other vegetables and frozen legumes. Peru has had phenomenal success, growing asparagus exports by 130%, from $77m to $178m from 2000 to 2004. Peru has also more than doubled its exports of frozen mixed vegetables, onions, peas and dried legumes. Chile and Guatemala have had rapid growth rates in frozen mixed vegetables and peas. China has grown its onion exports by over 900% and peas by over 600% and more than doubled its exports of frozen mixed vegetables, frozen legumes, cassava, carrots, capsicum and cabbages, cauliflower and broccoli. Poland and Ecuador

Table 25: NAFTA imports of vegetables by variety, 2004

	2004 imports (US$m)						Annual growth, 00-04 (%)		% of NAFTA market			
Product	**Can**	**Mex**	**US**	**NAFTA**	**Intra-NAFTA**	**Extra NAFTA**	**NAFTA**	**Extra**	**Can**	**Mex**	**US**	**Extra**
Tomatoes	262	847	150	1,348	1,259	88	11.0	-8.8	19.4	62.9	11.2	6.5
Capsicum & pimenta	105	520	74	887	698	188	9.9	9.4	11.8	58.6	8.4	21.3
Frozen mixed vegetables	48	202	19	416	269	147	10.8	20.7	11.6	48.5	4.6	35.3
Other vegetables	11	288	68	413	366	47	9.6	13.2	2.6	69.6	16.4	11.4
Cucumbers & gherkins	61	321	9	408	390	18	17.0	22.1	14.9	78.5	2.2	4.4
Onions, etc.	25	185	72	403	282	120	11.2	25.8	6.3	46.0	17.8	29.9
Lettuce	14	21	242	292	277	15	9.0	2.0	4.6	7.3	82.8	5.2
Asparagus	2	86	16	289	103	185	12.7	20.2	0.6	29.7	5.4	64.2
Dried legumes	85	20	72	251	178	74	4.9	-0.7	34.0	8.1	28.6	29.4
Cabbages, etc.	23	75	134	236	232	3	8.0	16.9	9.8	32.0	56.8	1.4
Carrots, etc.	26	27	94	153	147	6	8.2	23.7	17.2	17.7	61.4	3.7
Potatoes	88	-	60	149	149	0	-2.6	16.6	59.3	-	40.5	0.2
Casava, etc.	-	0	17	145	17	128	8.3	8.0	-	0.2	11.5	88.3
Mushrooms	66	3	9	88	78	10	12.1	6.1	74.7	3.7	9.9	11.6
Frozen legumes	24	0	11	80	35	45	12.4	15.8	30.0	0.2	13.7	56.0
Beans	2	41	27	73	70	4	8.6	16.4	2.2	56.5	36.3	5.0
Aubergines	1	50	5	67	56	11	16.2	27.4	0.9	74.0	8.2	16.9
Celery	2	8	42	52	52	0	-0.7	-24.7	3.2	15.5	81.2	0.1
Peas	0	10	5	45	16	29	13.3	22.3	0.6	23.0	12.1	64.4
Spinach	3	7	34	44	44	0	21.5	6.6	7.3	15.6	76.4	0.7
Veg provisionally preserved	0	3	1	33	4	29	-6.2	-5.1	0.8	8.4	2.7	88.1
Sweet corn	13	0	8	23	21	2	11.7	39.7	55.2	0.1	35.6	9.0
Frozen spinach	0	5	4	13	9	4	20.5	65.9	0.0	39.8	30.1	30.1
Other legumes	0	1	0	4	1	3	-7.1	-10.9	8.0	13.3	4.5	74.2
Artichokes	-	1	2	4	3	0	0.9	-8.0	-	24.8	64.8	10.5
Frozen potatoes	0	-	0	1	1	0	-24.2	-20.3	31.7	-	29.7	38.6

Source: UNCTAD WITS and own calculations

have prominently entered the frozen mixed vegetables market, with Ecuador expanding its exports of the variety by just under 900% to $15m and Poland by 350% to $3.5m. Poland has also entered the frozen legumes market, whilst Ecuador has entered the cassava, cabbages and other legumes markets. New Zealand, another relatively new player, has made inroads in the legumes markets (both dried and frozen), as well as in onions and other vegetables. The Philippines, which until a few years ago exported virtually no vegetables to the region, has suddenly become a substantial exporter of onions and garlic.

So which countries outside of the NAFTA region are earning good foreign reserves from vegetable exports? The Netherlands, Israel and Spain have captured the majority of the capsicum and pimento market not already captured by NAFTA members, while Guatemala, China and Ecuador are the leaders in frozen mixed vegetables. China, Peru and Chile supply onions, shallots and garlic, and Peru has cornered the asparagus market ($178 m or 62%). The US and Canada also import dried legumes from India and cassava from the Caribbean, especially Costa Rica and the Dominican Republic, while many of the frozen legumes originate from China. There are also a number of new players in the market who as yet are not necessarily exporting massive amounts but are certainly gaining market share as especially the US and Canadian markets begin to open up.

4.4 East Asia

East Asia is an important region for vegetable exporters, both because of existing markets (predominantly Japan) and those that are rapidly emerging (China and Korea). Table 26 illustrates this point – in 2004, total imports of vegetables amounted to $2.6bn, with Japan's market at just under $1.7bn, and China and Korea growing at 50% and 26%, respectively, from 2000 to 2004. However, the Japanese market has contracted, with vegetable imports to Japan declining by 1.2% per annum over the past four years. Because Japan forms such a large part of the total East Asian market (64%), the region's growth rate has only been 3.5% per annum for the period under review. Growth for the region was even slower at 1.1% from 1996 to 2000.

The leading suppliers to this region are China, Thailand, the US and New Zealand, as well as other countries in close proximity, such as Vietnam, Korea, Australia and Taiwan. Many of these countries have not fared so well recently, with the US, New Zealand, Korea, Australia, Mexico and the Netherlands all recording negative growth rates, and China, Taiwan and Canada very low growth rates. Of those countries exporting to Japan, only Vietnam and Thailand have been able to grow their exports. Both these countries have done well in most countries in the region, with Thailand expanding its exports to East Asia by 48% per year and Vietnam by 27%. Ecuador and Guatemala have also recently become prominent players in Japan. New Zealand, the US, Mexico,

Australia and the Philippines, although performing badly in Japan, have been able to switch their attention to the growing Korean market, although Korea still sources 63% of its vegetable imports from China. Chinese imports of vegetables come from Thailand (69%), Vietnam (13%), Indonesia (5.5%) and to a lesser extent the US and Canada (both 3%).

Table 27 illustrates which varieties are being imported into the East Asian region and in what quantities. It also highlights the relative share of imports that originate from countries outside of the region. This share varies greatly between varieties and between those commodities that China produces and exports and those that it does not. 44% of total vegetable imports in the region come from China, of which frozen mixed vegetables ($240m), onions, garlic, etc. ($150m), preserved vegetables ($123m) and mushrooms ($119m) are the most important categories. It is evident that those commodities in which China has the advantage and accounts for a large percentage of the import share are also those commodities for which annual growth for countries outside of the region has been very low or even negative, for example, frozen mixed vegetables, onions, etc., preserved vegetables, mushrooms, carrots, peas and frozen potatoes. This implies that China is expanding its competitive advantage in products that it already exports. As such, potential exporters are unlikely to be able to compete in these products. In fact, there are only two commodities that have shown good growth in exports from outside suppliers – frozen spinach and cassava. In 2000, Vietnam exported no frozen spinach to East Asia; four years later it exported $7m worth. Taiwan has also just entered the frozen spinach market. At the same time China, which was exporting $42m worth of frozen spinach, dropped to just $6m. This phenomenon may have something to do with increased exports (about $2m) to the US, but it is more likely because of increased demand in the Chinese domestic market.

Another variety that has suddenly experienced incredible import demand in the region (almost entirely from China) is cassava. Thailand has responded to this demand by increasing its exports of cassava from $8m to $300m (more than 36 times), Vietnam has increased its exports from $25m to $75m and Indonesia from $19m to $27m. Ironically, in world terms, cassava is an export product for South Eastern Asian, Central American and the Caribbean countries but not for African countries, where more than 50% of world production occurs. In Africa the vegetable is used predominantly for human consumption (starch, pastes, flour, etc.), whereas in China (and other Asian countries) the crop is used not only as food but also as feed for animals, and perhaps more importantly, as a binding agent in the production of paper and textiles and in monosodium glutamate (for food flavouring). The crop is ideally suited to be grown in many African countries due to its

Table 26: East Asian imports of vegetables, 2004

Rank		Imports, 2004 (US$m)						Annual growth, 00-04 (%)						Growth (%) p.a.	
		Jap	Chi	Kor	HK	Tai	East Asia	Jap	Chi	Kor	HK	Tai	East Asia	96-00	96-04
	The World	1,680	397	241	184	92	2,594	-1.2	50.2	25.9	-6.3	2.2	3.5	1.1	2.3
1	China	868	-	152	126	14	1,159	0.0	-	30.9	0.5	5.8	2.4	4.7	3.5
2	Thailand	81	274	21	4	18	398	7.7	164.4	110.8	-5.6	18.7	48.6	-14.4	12.8
3	US	225	13	16	20	22	297	-6.7	-2.3	30.8	-22.9	2.7	-6.8	-3.3	-5.1
4	New Zealand	109	4	5	6	3	126	-2.7	6.5	67.7	-6.4	-3.2	-1.8	2.4	0.2
5	Vietnam	11	50	26	0	6	94	27.0	97.0	4.7	-24.4	-0.6	26.8	16.2	21.4
6	Korea, Rep.	86	0	-	0	0	87	-2.3	38.9	-	5.6	-6.9	-2.3	25.1	10.6
7	Taiwan, China	72	1	0	3	-	77	2.9	2.6	-4.1	-4.2	-	2.5	-5.4	-1.5
8	Australia	36	1	8	10	4	60	-0.9	0.6	19.9	-13.6	-14.4	-3.3	-7.3	-5.3
9	Canada	29	13	1	1	4	48	2.2	-3.3	-2.2	-16.5	3.3	0.0	-0.3	-0.1
10	Mexico	38	0	0	-	0	38	-7.9	-66.4	37.1	-	-51.1	-9.0	-6.6	-7.8
11	Indonesia	6	22	6	0	3	36	6.2	11.6	1.5	-24.1	7.4	7.9	-7.3	-0.0
12	The Netherlands	24	0	0	3	0	28	-5.3	-3.7	-7.3	-9.4	-33.7	-6.5	3.3	-1.7
13	Myanmar	5	3	3	0	5	16	-11.2	22.4	2.4	-14.0	0.9	-1.1	1.4	0.1
14	Philippines	14	-	0	0	1	15	-13.1	-	197.9	3.3	159.8	-11.0	-9.1	-10.0
15	Japan	-	0	0	6	7	14	-	-1.5	-5.4	1.0	-1.4	-0.6	9.8	4.5
Selected countries															
18	Korea, Dem. Rep.	10	2	-	-	-	11	-17.5	36.7	-	-	-	-14.8	17.3	-0.1
19	Ecuador	10	-	-	-	-	10	27.7	-	-	-	-	27.7	-	-
28	Argentina	1	-	-	-	1	2	1.5	-	-100.0	-	287.6	22.0	-20.3	-1.4
29	Guatemala	2	-	0	-	-	2	22.2	-	-	-	-	22.2	288.1	117.8

Source: UNCTAD WITS and own calculations

hardy nature, because it can be cultivated in marginal lands with poor soil and its ability to survive prolonged droughts. The sudden increased demand for the product in China (and other Asian countries), combined with its increasing importance for sustenance in Africa (it is now being used as a substitute for wheat flour), means that cassava holds massive potential for future exports.

Deemed as particularly important is the rapidly emerging Chinese vegetable market, both in production and consumption, especially given the decline of the giant importer in the region, Japan. China produces almost half of the world's vegetables, and because vegetables form an important component of the traditional diet, the Chinese market has always been a truly gigantic one. More recently, with increasing incomes and a shift from traditional staple foods, greater levels of trade brought on by China's emergence as an economic 'superpower' and its joining of the WTO, and lagging production techniques (and a lack of commercialisation), many have speculated that the Chinese market might provide enormous opportunities for those ready and able to supply vegetables. How long this window of opportunity will exist, or even if it will

arise in the first place, depends greatly on the supply-side response of the Chinese agricultural sector. It may also crucially revolve around whether certain infrastructural and transport logistics can be overcome by those directing operations in China. Low-technology farming techniques and operations in China are rapidly being replaced by commercialised farms, co-operatives and other joint ventures, many of which are being financed substantially through the government. However, much of the competitive advantage that exporters might have at the moment is based on low capital availability and (partly as a result of this) inferior quality products, as well as limited use of marketing techniques (production and packaging) and industry-wide standards. Thus, whilst demand for vegetables is expected to continue to increase at a

Table 27: East Asia's imports of vegetables by variety, 2004

	Imports, 2004 (US$m)					Extra-EA share (%)	China share (%)	Growth, 00-04 (%) p.a.	
	China	Taiwan, China	East Asia	Intra-EA	Extra-EA			East Asia	Extra-EA
Cassava, etc.	71.9	0.0	483.5	79.3	404.2	83.60	14.87	37.5	65.7
Frozen mixed veg	239.8	0.8	315.6	241.2	74.4	23.57	75.99	8.3	-3.8
Onions, etc.	149.7	0.6	208.8	151.2	57.7	27.61	71.68	8.8	-7.0
Other vegetables	86.6	1.4	204.0	92.0	112.0	54.90	42.44	3.1	1.8
Dried legumes	94.8	0.2	198.0	95.2	102.9	51.94	47.87	1.5	0.1
Frozen legumes	73.9	48.6	176.0	122.6	53.4	30.35	41.99	-3.0	-0.8
Cabbages, etc.	68.3	0.3	174.5	76.5	98.0	56.17	39.17	-0.8	-5.9
Mushrooms	118.7	1.5	171.2	135.2	36.0	21.03	69.32	-8.7	-5.8
Veg preserved	123.0	0.2	133.7	123.5	10.2	7.65	91.95	-4.2	-5.4
Carrots, etc.	84.5	14.4	109.3	99.8	9.4	8.65	77.37	4.9	-15.2
Asparagus	0.8	0.0	95.9	0.8	95.1	99.20	0.80	-5.3	-5.3
Capsicum & pimenta	1.4	0.0	87.0	51.0	36.0	41.36	1.55	6.1	-5.0
Sweet corn	2.6	0.0	76.2	2.7	73.5	96.45	3.39	-0.6	-0.9
Lettuce	4.7	0.7	41.4	6.1	35.3	85.23	11.24	1.4	-1.6
Peas	19.8	-	22.3	19.8	2.5	11.17	88.83	-13.3	-0.1
Frozen spinach	6.7	4.8	21.8	11.5	10.3	47.19	30.66	-15.5	203.2
Potatoes	0.9	-	19.4	1.2	18.3	94.04	4.50	11.2	15.2
Tomatoes	1.4	-	18.7	9.7	9.0	48.31	7.48	-11.5	2.8
Celery	0.8	0.0	9.7	0.9	8.8	91.10	8.68	-11.1	-12.9
Frozen potatoes	4.2	0.0	8.3	4.3	4.0	47.82	51.15	-28.6	-39.0
Beans	0.3	0.0	6.0	0.3	5.7	94.87	4.66	2.8	3.1
Cucumbers & gherkins	2.4	-	4.8	4.6	0.2	3.98	50.68	-20.8	-20.7
Other legumes	0.6	2.9	4.3	3.5	0.8	18.26	13.43	-15.5	-15.2
Aubergines	1.0	-	3.1	3.1	0.0	0.62	31.32	-9.4	-15.8
Spinach	0.5	-	0.8	0.6	0.1	17.89	64.56	24.6	9.7
Artichokes	0.0	-	0.2	0.0	0.2	99.73	0.27	9.4	9.3
Total	1,159.1	76.6	2,594.5	1,336.5	1,258.0	48.49	44.68	3.5	5.1

Source: UNCTAD WITS and own calculations

rapid pace for an indefinite period, the real question is whether Chinese producers will respond to these market signals and increase both the production of those varieties in short domestic supply and the quality of their produce. At the same time, many foreign (generally larger) companies have invested in packing houses and cold storage systems to take advantage of China's lower labour costs. The verdict is therefore still out on the long-term prospects for trade, but anyone wishing to compete effectively in this market will have to do so on the basis of quality, reliability and consistency.

4.5 SADC export performance

SADC's trade in vegetables is heavily dominated by four countries: South Africa with 35% of all trade in the region, Tanzania with 22%, Zimbabwe with 14.5% and Zambia with 13%. In total, the SADC region exported $133m worth of fruit in 2004. Roughly 60% of all exports from the region were destined for the EU ($79m), followed by other SADC countries ($22.4m or 16.8%) and South Asia ($21.3m or 16%). South Africa exported predominantly to the EU, other SADC countries and to a lesser extent to the US. Most of South Africa's exports to the SADC region were dried legumes, of which $9m went to Zimbabwe and $1.2m to Zambia, whilst the country's biggest overall trade partner was the UK (frozen vegetables, other vegetables, onions, carrots, etc., cabbages, cauliflower and broccoli, and asparagus). Tanzania, on the other hand, hardly exported any vegetable produce to other SADC countries, but traded with South Asia (some $13.7m), most of which was dried legumes that were sent to India, and the EU (beans, peas and other vegetables to the UK, and dried legumes to the Netherlands). Malawi and Mozambique also exported dried legumes to India. Zambia and Zimbabwe both exported beans and peas to the UK, while Zimbabwe also exported peas to the Netherlands, potatoes to Zambia and small amounts of different vegetables to South Africa.

SADC has seen positive per annum growth in exports to the EU (12.9% from 2000 to 2004), led by good export growth to the newer eastern members (90%). It has also grown its exports to South Asia by some 78% from 2000 to 2004 (24% from 1997 to 2000), thanks to Tanzania, Malawi and Mozambique (dried legumes). Exports to other SADC countries, East Asia and the Middle East have been declining in the last four years. Exports of vegetables from Tanzania have seen the best growth over the period (62% per annum). Namibia's exports have grown at over 200% but this was off a low base. Zambia, Malawi and Mozambique have seen good growth rates of 20% or more. South Africa and Zimbabwe exhibited declining growth rates, with South Africa's due to a growing domestic market and Zimbabwe's due to internal political and economic issues. South Africa saw the best growth (27%) over the period 1997 to 2000.

Table 28: SADC vegetable exports by region and country (US$'000 or %)

												Growth (%) p.a.	
Country	EU 15	EU 10	EU total	Africa	SAARC	E Asia	Mid East	NAFTA	SADC	Total	%	97-00	00-04
South Africa	24,349	116	24,465	14,883	17	224	47	1,143	14,326	46,725	34.9	27.2	-5.3
Tanzania	13,244	829	14,073	1,032	13,710	17	86	-	753	28,979	21.7	-12.1	62.1
Zimbabwe	15,265	6	15,271	3,717	-	-	-	1	3,680	19,333	14.5	0.5	-5.5
Zambia	17,030	-	17,030	218	-	-	-	1	191	17,402	13.0	-3.3	19.0
Malawi	475	7	483	1,031	3,933	-	-	15	769	6,646	5.0	-4.3	22.5
Madagascar	4,859	-	4,859	1,100	-	-	2	2	1,100	5,986	4.5	-16.6	1.8
Mozambique	9	-	9	1,641	3,644	24	-	31	1,641	5,398	4.0	16.5	36.1
Swaziland	1,685	-	1,685	7	-	-	-	-	7	1,692	1.3	-	-0.0
Namibia	887	35	922	-	-	-	-	-	-	924	0.7	-	213.9
DRC	447	-	447	-	-	-	-	-	-	491	0.4	-11.8	-7.9
Mauritius	135	-	135	-	-	-	-	-	-	171	0.1	21.6	-7.1
Angola	16	-	16	-	-	-	-	-	-	16	0.0	-19.6	77.1
Botswana	-	-	-	-	-	-	-	10	-	10	0.0	-	-17.4
Lesotho	2	-	2	-	-	-	-	-	-	2	0.0	-	-65.8
SADC	78,405	993	79,397	23,630	21,304	265	135	1,202	22,468	133,775	100.0	9.2	5.5
%	58.6	0.7	59.4	17.7	15.9	0.2	0.1	0.9	16.8	100.0			
Growth 97-00 (%)	-9.8	17.5	-9.8	83.0	24.3	-12.5	100.0	1.6	84.5	9.2			
Growth 00-04 (%)	12.9	90.4	13.2	-16.3	78.5	-11.4	-46.4	10.5	-16.8	5.5			

Table 29: SADC exports of vegetables by variety, 2004 (US$'000)

	SADC	SA	Tan	Zim	Zam	Mal	Mad	Moz	Swa	% total exports
Dried legumes	48,852	11,059	20,973	406	1	6,585	4,555	5,258	-	36.96
Other vegetables	19,144	6,559	2,071	3,780	4,726	-	1	1	657	14.49
Peas	15,436	396	1,570	5,973	7,207	6	271	-	12	11.68
Beans	12,940	81	3,990	4,287	4,395	-	188	-	-	9.79
Onions, etc.	9,719	8,920	23	336	29	-	358	-	-	7.35
Frozen vegetables	8,389	5,959	1	879	71	7	349	24	1,018	6.35
Potatoes	3,655	1,552	136	1,963	-	-	3	-	-	2.77
Mushrooms	3,516	3,193	-	315	-	8	-	-	-	2.66
Capsicum & pimenta	2,583	268	109	1,183	653	24	233	98	4	1.95
Cassava	2,565	2,512	1	1	-	-	11	-	-	1.94
Cabbages, etc.	2,169	2,102	7	31	8	-	-	4	-	1.64
Carrots, etc.	1,766	1,406	1	76	276	-	6	1	-	1.34
Asparagus	603	598	-	3	2	-	-	-	-	0.46
Tomatoes	413	361	3	-	-	-	10	11	-	0.31
Other legumes	234	114	20	74	27	-	-	-	-	0.18
Lettuce	118	113	1	4	-	-	-	-	-	0.09
Cucumbers & gherkins	57	33	-	23	-	-	-	-	-	0.04
Total	132,159	45,224	28,906	19,333	17,395	6,631	5,984	5,398	1,692	

Source for Tables 28 and 29: UNCTAD WITS and own calculations

5. Market access

5.1 General

Barriers to trade can be divided into tariff barriers (including quotas, ad valorem tariffs, specific tariffs and entry price systems) and non-tariff barriers (sanitary and phytosanitary measures, labels, etc.). The main markets for fruit employ various measures, both tariff and non-tariff, to protect their domestic industries. Whilst many of the non-tariff measures can be justified under the auspices of issues such as health and standards, the tariff measures are increasingly under the scrutiny of the WTO, and as such are gradually being phased out. Nevertheless, exporters need to be aware of all the barriers they may encounter when trying to get their produce on foreign shelves.

Tariffs, quotas and the entry price system

Tariffs are either designed to earn a Government revenue from products being imported or to raise the price of imports so as to render local produce more competitive and protect domestic industries.

Quotas can be used to protect domestic industries from excessive imports originating from areas with some form of comparative advantage (which can therefore produce lower cost produce). Tariffs and quotas are often combined, allowing imports to enter at a certain tariff rate up to a specified quantity. Thereafter, imports from that particular region will attract higher tariffs, or will not be allowed at all.

The entry price system, which is used in many northern hemisphere markets, makes use of multiple tariff rates during different periods (seasons), stipulating higher tariffs during those periods when domestic producers are trying to sell their produce, and lower tariffs during the so-called off-seasons. Alternatively, the tariff rate can be a function of the market price – if the produce enters at a price which is too low (and therefore likely to be too competitive), it qualifies for a higher tariff schedule.

Table 30 compares tariffs across three countries/regions – China, the EU and the US – for vegetable products (unfortunately data were not readily available for Japan, as its tariff structures are complex). These tariffs are the most favoured nation (MFN) tariffs, and are generally applicable to any country that does not have a preferential trading agreement (PTA).

Of course, South Africa has a PTA with the EU, and all countries within SADC (bar Zimbabwe) have access to the US market under the AGOA, which significantly lowers tariff barriers. Certain countries in SADC are also able to access preferential tariffs into the EU under the 'Everything But Arms' preferential agreement for the Least Developed Countries (LDCs) of the world – Angola, the Democratic Republic of Congo, Lesotho, Madagascar, Malawi, Mozambique, Tanzania and

Zambia. This is a highly preferential agreement where the tariffs on most goods are zero.

The rest of the countries can access the EU market through the more general GSP (General System of Preferences), which was recommended by the United Nations Conference on Trade and Development (UNCTAD) in 1968, and first implemented in the EU in 1971. The current cycle of the agreement started on 1 January 2006 and will run until 31 December 2008.

Japan also has a GSP system in place, for which all of the SADC countries qualify; however, China as yet does not have any preferential

Table 30: Tariffs for selected countries and vegetables, 2004

		China		EU		US	
Product	**Product name**	**AHS***	**MFN**	**AHS**	**MFN**	**AHS**	**MFN**
070110	Potatoes	13	13	3.53	4.5	0	n/a
070190	Potatoes	13	13	7.65	10.36	0	n/a
070200	Tomatoes	n/a	n/a	7.82	10.9	0	n/a
070310	Onions and shallots	13	13	7.75	9.6	0	n/a
070320	Garlic	13	13	2.2	n/a	0	n/a
070390	Leeks & other alliaceous vegetables	n/a	n/a	6	10.4	0.33	20
070410	Cauliflowers and broccoli	10	10	1.9	n/a	0.24	8.83
070420	Brussels sprouts	13	13	10.67	12	0.17	12.5
070511	Lettuce	10	10	2.66	n/a	0	n/a
070610	Carrots and turnips	13	13	9.93	13.6	0.01	7.45
070700	Cucumbers and gherkins	n/a	n/a	7.72	14.02	0	n/a
070810	Peas	13	13	0.67	9.87	0	n/a
070820	Beans	n/a	n/a	4.17	n/a	0	0
070890	Other legumes	n/a	n/a	2.23	11.2	0	0
070910	Artichokes	13	13	9.5	10.4	1.13	11.3
070920	Asparagus	n/a	n/a	6.74	10.2	3.35	13.15
070930	Aubergines	13	13	10.26	12.8	0	n/a
070951	Mushrooms agaricus	13	13	8.51	12.8	0	n/a
070952	Truffles	13	13	5.57	6.4	0	0
070960	Capsicum & pimenta	13	13	1.36	3.4	0	n/a
070970	Spinach	13	13	9.16	10.4	0.04	20
070990	Other vegetables	13	13	4.53	11.21	0.11	14.37
071010	Frozen potatoes	13	13	13.83	14.4	3.79	14
071021	Frozen peas	13	13	12.45	14.4	0	n/a
071022	Frozen beans	13	13	7.93	14.4	3.06	5.6
071040	Sweet corn	10	10	0	n/a	0.49	14
071090	Frozen mixed vegetables	10	10	9.92	14.4	1.16	10.95
071120	Olives	13	13	1.83	6.4	0	n/a
071130	Capers	13	13	0.15	4.8	6.48	8
071340	Lentils	3.5	3.5	0	0	0	n/a
071410	Cassava	8.33	8.33	0	n/a	0.01	9.6

* Effectively applied rates, taking into consideration applicable (and available) preferential rates

Source: ITC MacMAP & UNCTAD Trade Analysis and Information System

agreements with any of the SADC countries. Therefore, when considering table 30, it is important to remember that it is only useful as a rough glance at the general level of tariffs that one may expect to encounter when trying to export to a particular country.

In reality, the tariffs are likely to be far lower for SADC countries when considering the preferential agreements, but at the same time, most tariff structures are particularly complex, with quotas, seasonal tariffs and specific tariffs (an amount per unit rather than a percentage of the value) all contributing to many different tariff lines and often higher duties payable than one might have anticipated initially. One must also bear in mind that most tariff are designed to protect domestic industries, and as such are likely to discriminate against those attempting to compete with the domestic producers of that country. Again, this could be seen as an advantage for SADC with its counter-seasonal harvest periods.

Notwithstanding the fact that there are limitations to an analysis from the tariff data since it is too disaggregated, one can clearly see that China has relatively high tariffs, which for the most part are set at 13% of the value of the commodity being imported (*ad valorem*). Added to this is the fact that there is no preferential access to the country's markets as yet, something that is currently enjoyed in varying degrees by SADC countries for all the other markets shown in the table. Any form of preferential access would mean far lower general tariffs than those represented in table 30.

For those commodities where the rate is shown as n/a there are either quotas in place or other systems which make calculating an average weighted equivalent unfeasible. The MFN column shows the official rates for countries with MFN status, while the AHS rates are calculated by UNCTAD TRAINS to show the actual average applied rates for all countries worldwide. Because many countries have preferential rates, this AHS rate is shown as lower. One can also see that certain countries wishing to protect particular industries (presumably in which they feel vulnerable or where a large number of farmers are employed) will raise tariffs to prohibitive levels, whereas those commodities in which they have the productive edge (or no need to protect) will have lower tariffs (for example, compare the EU's tariff's on cucumbers and gherkins to capsicum and pimenta, or lentils). Many developed countries also try to protect those industries which require further processing (and presumably incorporate higher value added) over the more primary industries.

Whilst tariff regulations can be prohibitive and result in inferior market access, it is often the non-tariff barriers that restrict developing countries from successfully entering the large developed markets. Many of these barriers revolve around different types of standards, including SPS, food health and safety issues, food labelling and packaging, organic produce certification, quality assurance and other standards and grades.

5.2 The European Union

5.2.1 General

The EU is a customs union whereby all countries within the union have a common external tariff for third countries. At the same time the EU implements a Common Market Organisation (CMO) structure in an attempt to stabilise and control the agricultural sector through a series of policy mechanisms and trade agreements. Thus policies and tariffs (and other trade barriers) are controlled centrally and apply to all the countries within the EU. By managing the amount of produce that enters the market, the EU hopes to be able to support and protect local farmers from sudden inflows of various vegetable varieties, which would drive prices down (and presumably bankrupt or seriously injure farmers' revenues), whilst at the same time deliver enough produce to meet domestic demand adequately, and maintain prices at reasonable levels (keeping consumers happy).

The EU are able to achieve these objectives by having seasonal tariff structures which are highest during European peak harvesting seasons (the price entry system), quotas and specific tariffs, and various policies that allow, amongst other things, government organisations to purchase produce should supply rise too quickly (and thereby maintain prices), and then release this excess back onto the market as and when supply drops again. The immediate implication of these policies for SADC countries is that an opportunity exists to supply the European market in off-season periods, as the produce would not compete directly with European producers and thus would not be liable to a whole array of tariffs and other protective mechanisms. However, there are other non-tariff barriers, including the phytosanitary and food-health regulations laid down by EU legislation, marketing standards and certificates of conformity, and the ever-changing demand patterns of the EU consumers. Europeans have recently become more focussed on the health and safety of a product, the production techniques, whether they are environmentally friendly and socially responsibly produced, and various labels that designate where and how the product was produced and to what standards it conforms. In a word, quality is the key.

The legislature that controls the vegetable sector is extensive, and all the amended directives that apply to the particular vegetable produce one wishes to export are listed at *http://europa.eu.int/eur-lex/*lex/en/repert/036054.htm. One caveat, though: it can quite a task to read through all the legislature covering the products of interest.

5.2.2 The Common Agricultural Policy

Price supports

The EU Agriculture Commission determines the market policy of vegetables through its common agricultural policy (CAP), which applies

to all vegetables except olives, potatoes and sweet corn. These commodities have their own specialised policy regimes due to their sensitive nature and perceived importance in terms of employment and other political objectives. It is important that potential exporters understand the CAP structure, as it has a significant effect on agricultural market prices and therefore on agricultural markets, and is not only a part of but the main reason for the high levels of protection that exist for the EU farmers.

The CMO for vegetables is implemented through the various producer organisations (POs) who have contracts with local growers (members). In all there are some 1400 POs handling over 40% of all (fruit and) vegetable production in the EU, with some countries having much higher proportions of vegetables handled by POs (Belgium and the Netherlands 70%, and France and Spain 50%) and some countries having less (Italy 30%) (Huang, 2001).

Compensation for withdrawal of produce from markets is made if prices are deemed too low by the various POs, whilst processing aid (for canning and preserving fruit) is also available to farmers to divert fresh produce away from over-supplied markets, for storage or eventual export. Because all of the production of PO members must go through the PO, it becomes easier to apply the various rules on compensation and financing, and these POs become responsible for determining prices and paying compensation, as well as ensuring that the grower adheres to good environmental practices. Produce that is withdrawn is either destroyed or distributed to institutions that would not affect EU markets, which introduces the debate on food aid, its source of supply and its effects on developing countries markets.

The withdrawal and processing compensation programmes clearly have an effect on the prices that can be fetched on the European markets for the affected produce, as well as on growers' long-term planning and whether they intend planting/harvesting more or less produce in the coming seasons. The regulatory effects are therefore seen as particularly important for maintaining the livelihoods of farmers/growers and the resultant stability (against unemployment and dissent) in these sectors. They are also seen as vital in maintaining healthy political relations between different member states, which have varying proportions of farmers in their populations, and some more successful/profitable than others. The sensitivity of these withdrawal and processing compensation funds, in terms of vegetables, is due to the fact that much of the fruit is produced in the Mediterranean region where many farmers are dependant on these funds and other subsidies to remain profitable. Tomatoes, cauliflowers, melons (including watermelons) and aubergines are the main vegetable candidates for support (as well as the massive olive oil processing fund), and are seen as the quid pro quo for the northern countries' receipt of funds from CAP for grains and animal products. Of course any attempt to maintain certain minimum

(inflated) prices cannot succeed without strict controls on 'cheaper' foreign imports – the reason why the tariff/quota/price entry system is so prohibitive and complex.

The EU is, however, aiming at reducing some of these price supports through a ratcheting system designed to lower the threshold level of metric tons that will be supported each year or the compensation amount payable, but so far progress has been limited. Processing aid in 2000 was €707m, and withdrawal funds for the same year €800m. The EU Agricultural Commission undertakes to withdraw produce and compensate farmers, depending on the market price, up to the threshold level and at the rate specified. Alternatively they will pay a certain rate (per ton) to aid the farmers to process the products further and export the processed produce. Table 31 gives an example of the threshold value and the amount available per ton for withdrawal compensation for tomatoes, the EU's largest 'protected' commodity.

Table 31: Threshold value and amount available (per ton) for withdrawal compensation: tomatoes

Country	EU	Greece	Spain	France	Italy	Portugal
Threshold ('000 tons)	8,251.0	1,211.0	1,239.0	402.0	4,350.0	1,050.0
Compensation (Euro/ton)	54.7	54.7	54.7	54.7	54.7	54.7

Source: Huang, 2001

Export subsidies, promotional aids and financial aids

In addition to the withdrawal and processing compensation funds allocated to the vegetable industry, the EU also provides export subsidies for fresh fruits to alleviate market pressures (€25m in 2000), promotional funds for marketing, restructuring funds for modernising markets and marketing structures, and other amounts available for those industries under pressure from international competitors. All of these funds allow European farmers to reduce the price of their produce to compete more effectively with foreign competitors. This, in addition to the complicated tariff structure (including quotas and the price entry system) can make entering the EU market, especially during peak EU harvesting periods, prohibitively difficult. Having said this, the EU is slowly lowering its export and other subsidies in compliance with the WTO, and especially after the last round of talks in Hong Kong, where it was agreed that all export subsidies would be abolished by 2013.

5.2.3 Tariff barriers

The EU makes use of tariffs and quotas, as well as a system which is known as the entry price system. In all there are thousands of lines.

The entry price system

The EU establishes an 'entry price' at which produce may enter the EU market, which is based not only on the market price for the current year (demand and supply) and for previous years, but also on the prices of domestic producers (prices they need to maintain profitability).

It is calculated by the regulatory authorities so that it can be used in combination with tariffs and quotas to aid the EU's attempts at protecting its agricultural system. The entry price is thus the minimum price at which produce may enter into the market; if the price of the produce is lower than this calculated price, it is liable to have duties imposed upon it over and above any duties/quotas it might ordinarily attract.

Agricultural duties are applied as follows:

- When the value of the imported party is between 92% and 94% of the entry price, 8% of the entry price will be added to the normal customs duty.
- When the value of the imported party is between 94% and 96% of the entry price, 6% of the entry price will be added to the normal customs duty.
- When the value of the imported party is between 96% and 98% of the entry price, 4% of the entry price will be added to the normal customs duty.
- When the value of the imported party is between 98% and 100% of the entry price, 2% of the entry price will be added to the normal customs duty.

Added to this is the quota system, which comes into effect should exports from a country exceed a certain amount. Under this system, the tariffs which are quoted, along with an entry price system, are only applicable should net imports from a particular country be under a certain amount (termed the trigger amount) during the 'peak seasons'. These are termed in-quota tariffs. Out-quota tariff's (when the quota is exceeded) are at a much higher rate.

5.2.4 Non-tariff barriers

Non-tariff barriers can be divided into those that are mandatory and laid out in the EU Commission's legislature, and those that are as a result of consumers, retailers, importers and other distributors' preferences.

Product legislation: quality and marketing

There are a number of pieces of EU legislation that govern the quality of produce that may be imported, marketed and sold within the EU.

General Food Law covers matters in procedures of food safety and hygiene (micro-biological and chemical), including provisions on the traceability of food (for example, Hazard Analysis and Critical Control Points, or HACCP), and is laid out under regulation EC 178/2002 (see http://www.europa.eu.int/comm/food/index_en.html).

EU Marketing Standards, which govern the quality and labelling of vegetables, are laid out in the CAP framework under regulation EC 2200/96 (see www.defra.gov.uk/hort/hmi/common/standard.htm). These regulations include diameter, weight and class specifications, and any produce that does not comply with these standards are not al-

lowed to be sold on the EU markets (detailed lists of products and their standards can be found in the annexes to the directive). The legislation (under EC 1148/2001) also dictates that a ***Certificate of Conformity*** must be obtained by anyone wishing to export and sell vegetables in the EU, if that particular vegetable falls under the jurisdiction of the EU marketing standards. Vegetables to be used in further processing needs a ***Certificate of Industrial Use***, whilst another legislative directive covers the ***Maximum Residue Limits*** (MRL) of various pesticides allowed.

Product legislation: phytosanitary regulations

The international standard for phytosanitary measures was set up by the International Plant Protection Committee (IPPC) to protect against the spreading of diseases or insects through the importation of certain agricultural goods. The EU has its own particular rules formalised under EC 2002/89, which attempts to prevent contact of EU crops with harmful organisms from elsewhere in the world. Article 13 of the directive states that:

"...member states should ensure... that plants, plant products or other objects, listed in Annex V, Part B, which come from a third country and are brought into the customs territory of the Community, shall, from the time of their entry, be subject to customs supervision pursuant to Article 37(1) of the Community Customs Code and also to supervision by the responsible official bodies... such as to conclude, as a result of these formalities and as far as can be determined:

- That the plants, plant products or other objects are not contaminated by harmful organisms listed in Annex I, Part A.
- In the case of plants or plant products listed in Annex II, Part A, that they are not contaminated by the relevant harmful organism listed in that Annex.
- In the case of plants, plant products or other objects listed in Annex IV, Part A, that they comply with the relevant special requirements indicated in that Annex.

(Directive 2002/89 of the European Union Commission)

The crux of the directive is that it authorises the Plant Protection Services to inspect a large number of vegetable products upon arrival in the EU. This inspection consists of a physical examination of a consignment deemed to have a level of phytosanitary risk, identification of any harmful organisms and certification of the validity of any phytosanitary certificate covering the consignment. If the consignment does not comply with the requirements, it may not enter the EU, although certain organisms can be fumigated at the expense of the exporter. The annexes to the Directive contain an extensive list of the various bacteria, fungi, viruses, insects and other organisms that are either banned outright (Annex I & II, Part A, for example *Liberobacter africanum*) or only to specific protected zones (Annex I & II, Part B). They also contain a list of plants and plant products that are prohibited if they originate from

certain areas/countries (Annex III) or require plant health inspections (Annex V). Annex IV details special requirements that must be adhered to for various plants and plant products.

Once the consignment has been inspected, a phytosanitary certificate is authorised. It is not always necessary to inspect each and every batch – generally, phytosanitary certificates can be issued at the point of origin to facilitate the process. An acceptable phytosanitary certificate needs to include various stipulations: the origin and destination of the plant, botanical names of produce, net weight, etc. It also needs to be authorised by a plant protection services officer and issued within 14 days of leaving the country.

Product legislation: packaging

The EU commission lays downs rules for materials that come into contact with food and which may endanger people's health or bring about an unacceptable change in the composition of the foodstuffs. The framework legislation for this is EC 1935/2004. Recycling packaging materials are also emphasised under 94/62/EC, whereby member states are required to recycle between 50% and 65% of packaging waste. If exporters do not ship produce in packaging which is reusable, they may be liable for the costs incurred by the importing companies. Wood packaging is subject to phytosanitary controls (see Directive EC 2002/89) and may need to undergo heat treatment, fumigation, etc.

Non-legal market requirements: social and environmental accountability

To access a market, importers must not only comply with the legal requirements set out above, but also with market requirements and demands. For the most part, these revolve around quality and the perceptions of European consumers about the environmental, social, health and safety aspects of both the products and the production techniques. Whilst supplying vegetables that complies with these issues may not be mandatory in the legal sense, they are becoming increasingly important in Europe and cannot be ignored by existing or potential exporters.

Social accountability is becoming important in the industry, not only amongst consumers, but also for retail outlets and wholesalers. The Social Accountability 8000 (SA8000) certification is a management system based on International Labour Organisation (ILO) conventions, and deals with issues such as child labour, health and safety, and freedom of association, and requires an on-site audit to be performed annually. The certificate is seen as necessary for accessing any European market successfully. The major retailers in the EU also play an important role in tackling environmental issues, which means that exporters have to take these into account when negotiating exporting arrangements.

Consumers are becoming increasingly aware of ***environmental issues***, with consumer movements lobbying against purchasing non-

environmentally friendly or non-sustainable produce. To this end, both governments and private partners have created standards (such as ISO 14001 and EUREPGAP) and labels to ensure produce adhere to particular specifications.

Although ecolabels (for example, the EU Ecolabel, the Netherlands Milieukeur, the German Blue Angel and the Scandinavian White Swan) are voluntary, they can afford an exporter a marketing edge, as consumers wishing to purchase environmentally sound produce demand products that are easily recognisable.

Labels are an absolute must for exporters attempting to enter the rapidly expanding organic produce market. The EU Commission has recently adopted an EU label for identifying food produced according to EU organic standards in the directive EEC 2092/91 (see www.europa.eu.int/comm/food/index_en.html).

Another important emerging label is Fairtrade, and includes those labels offered by Max Haavelaar Foundation, TransFair International and the FLO (Fairtrade Labelling Organisation). Recently a 'universal' logo was adopted, based on international fair trade standards developed by FLO, which covers, amongst other things, minimum quality and price, various processing requirements, compensation of small farmers that covers sustainable production and living standards, and contracts that allow for long term-planning and development (see www.fairtrade.net/sites/standards/general.html or www.maxhavelaar.nl).

Consumer health and safety requirements

Increasing consumer conscience about health and safety issues has prompted a number of safety initiatives in Europe, such as EUREPGAP on good agricultural practices (GAP) by the main European retailers (www.eurep.org), the international management system of HACCP, which is independently certified and required by legislation for European producers as well as food imported into Europe (EC 852/2004), and the ISO 9000 management standards system (for procedures and working methods), which is certified by the International Standards Organisation (ISO) (see www.iso.ch).

5.3 The United States

5.3.1 Tariff barriers

Table 32 lists the applicable tariffs on selected vegetables categories entering the US during different time periods. The first column contains the MFN rates, which are for the most part specific tariffs or tariffs that attract a duty based on the number of units or the weight of units being imported. The second column gives an approximation of what the ad valorem tariff (which is a percentage of the value of the imports)

Table 32: MFN and preferential tariffs on selected vegetables for SADC and other countries

HST 8 code	Product description	MFN rates	Rates for SADC	Pref. Agree	Chile PTA
7011000	Seed potatoes, fresh or chilled	0.5 cents/kg	0.00%	LA	0.2 cents/kg
7020020	Tomatoes, Mar. 1 to July 14, or Sept. 1 to Nov. 14 in any year	3.9 cents/kg	0.00%	A	2.9 cents/kg
7020040	Tomatoes, July 15 to Aug. 31 in any year	2.8 cents/kg	0.00%	A	2.1 cents/kg
7020060	Tomatoes, Nov. 15 thru the last day of Feb. of the following year	2.8 cents/kg	0.00%	G	0
7039000	Leeks and other alliaceous vegetables nesi, fresh or chilled	20%	0.00%	LA	16.60%
7041020	Cauliflower and broccoli June 5 to October 15, inclusive, in any year	2.50%	0.00%	G	0
7041040	Cauliflower and broccoli, not reduced in size, Oct. 16 through June 4	10%	0.00%	G	0
7041060	Cauliflower and broccoli, reduced in size, Oct. 16 through June 4	14%	0.00%	G	0
7042000	Brussels sprouts, fresh or chilled	12.50%	0.00%	G	0
7049020	Cabbage, fresh or chilled	0.54 cents/kg	0.00%	G	0
7051920	Lettuce, June 1 to October 31	0.4 cents/kg	0.00%	G	0
7051940	Lettuce, Nov. 1 through May 30	3.7 cents/kg	0.00%	G	0
7061005	Carrots, fresh or chilled, reduced in size	14.90%	0.00%	LA	Quota
7070020	Cucumbers, including gherkins, December 1 to the last day of February	4.2 cents/kg	0.00%	G	0
7070040	Cucumbers, including gherkins, March 1 to April 30	5.6 cents/kg	0.00%	G	Quota
7070050	Cucumbers, including gherkins, May 1 to June 30, or Sept. 1 to Nov. 30	5.6 cents/kg	0.00%	A	4.4 cents/kg
7070060	Cucumbers, including gherkins, July 1 to August 31	1.5 cents/kg	0.00%	G	0
7081020	Peas, shelled or unshelled, July 1 to Sept. 30	0.5 cents/kg	0.00%	G*	0
7081040	Peas, shelled or unshelled, Nov. 1 to June 30	2.8 cents/kg	0.00%	G	0
7082010	Lima beans, shelled or unshelled, November 1 to May 31	2.3 cents/kg	0.00%	G*	0
7082020	Cowpeas (other than black-eye peas), shelled or unshelled	Free	0.00%		0
7082090	Beans nesi, shelled or unshelled	4.9 cents/kg	0.00%	LA	2.4 cents/kg
7089005	Chickpeas (garbanzos), shelled or unshelled	1 cents/kg	0.00%	G	0
7089015	Lentils, shelled or unshelled	0.1 cents/kg	0.00%	G	0
7089040	Leguminous vegetables nesi, shelled or unshelled	4.9 cents/kg	0.00%	LA	2.4 cents/kg
7092010	Asparagus, September 15 to November 15, transported by air	5%	0.00%	G*	0
7092090	Asparagus, nesi	21.30%	0.00%	LA	15.90%
7093020	Eggplants (aubergines), April 1 to November 30	2.6 cents/kg	0.00%	G	0
7093040	Eggplants (aubergines), December 1 to March 31	1.9 cents/kg	0.00%	G	0
7095101	Mushrooms of the genus Agaricus	8.8 cents/kg + 20%	0.00%	LA	7 cents/kg & 16%
7095200	Truffles, fresh or chilled	Free	0.00%		0
7096020	Chili peppers, fresh or chilled	4.4 cents/kg	0.00%	G	0
7096040	Fruits of the genus capsicum (peppers) (ex. chili peppers) or pimenta (e.g. allspice)	4.7 cents/kg	0.00%	G	0
7097000	Spinach	20%	0.00%	LA	Quota
7099014	Okra	20%	0.00%	G	0
7099020	Squash	1.5 cents/kg	0.00%	G	0
7099035	Olives	8.8 cents/kg	0.00%	LA	6.6 cents/kg
7099045	Sweet corn, fresh or chilled	21.30%	0.00%	A	Quota

Note: * L = LDC, A = AGOA, G = GSP, M = MFN

would be (the calculation is performed using actual imported values). The third column shows the tariffs applicable to SADC members.

As can be seen from the table, SADC members have completely free access to the US markets under either the general GSP, the GSP for LDCs or the AGOA. The final column can be used as a reference point to see what Chile, a major vegetable supplier to the US and therefore one of SADC's main potential rivals, must pay in terms of tariff duties when exporting vegetables. Bear in mind that Chile's access to the US vegetable market is considered to be highly preferential under its own PTA, thus SADC's access, which is markedly lower than Chile's is 'as good as it gets'.

5.3.2 Non-tariff barriers

The US's phytosanitary regulation is conducted by APHIS (Animal and Plant Health Inspection Service), which is divided into nine subsections. PPQ (Plant Protection and Quarantine) and VS (Veterinary Services) are responsible for issuing permits for commodities and determining whether a commodity can be imported. The PPD (Policy and Programme Development) division works together with both of these divisions in determining long-term plans and import procedures.

Some products can get pre-clearance from International Services (IS) personnel stationed in the country of origin, either at exporting terminals or site inspections. The PPQ's main focus is to prevent the spread of diseases and pests into US agriculture resources, and it has personnel stationed at all airports, seaports and border stations that check imported cargo and oversee the quarantine process. Exporters or importers must make a request to export/import a commodity, provide as much information as possible on the product, its region of origin and its status (that is, whether there are restrictions or regulations governing that particular product from that particular region) before a permit is issued, along with the conditions of importation (disinfestation treatment) or mitigation measures. Denials can be challenged – and governments and companies can request a change in the status of a prohibited commodity (an investigation must be performed by the PPQ scientific team), as long as sufficient conditions have changed or a risk assessment has not been conducted within the last 10 years).

Most approved commodities can enter with inspection alone, but some may have to undergo mitigating measures, including post-harvest treatments (hot/cold temperature treatments, irradiation or fumigation, depending on the requirements and which particular treatment is least harmful), the establishment of specifically defined and maintained pest-free areas in a country (which obviously requires extensive co-operation between the country's plant health services and the APHIS IS division), or systems approaches (field surveys, random inspections or various on-site treatments).

A list of the various prohibited commodities originating from particular regions and those that require particular inspection or quarantine measures as a condition of entry can be found at www.aphis.usda.gov. An online programme explaining the procedures of APHIS and the USDA can also be found at www.aphis.usda.gov/is/sps.

In addition to phytosanitary regulations, the USDA Food Safety Inspection Services (FSIS) regulates sanitary practices in the packing of food products, while the Food and Drug Administration (FDA), which is part of the US Department of Health, regulates packaging and labelling (www.fsis.usda.gov/regulations_&_policies/labeling_guidance/index.asp). The HACCP protocol is used extensively. The USDA also has quality standards for vegetables that provide a basis for domestic and international trade and promote efficiency in marketing and procurement. At the same time the USDA issues quality certificates based on these standards and a comprehensive grading system. Graders are located around the country at terminal markets. These certification services, which facilitate the ordering and purchasing of products by large-volume buyers, assure these buyers that the products they purchase will meet the terms of the contract in terms of quality, processing, size, packaging and delivery. Detailed information is available at www.ams.usda.gov/fv/fvstand.htm. (For information on certification of organic produce, visit www.ams.usda.gov/nop/CertifyingAgents/CertAgenthome.html.)

5.4 Asian market access

Japan's agricultural sector is heavily protected, with calculations from the Organisation for Economic Co-operation and Development (OECD) estimating that almost 60% of the value of Japan's farm production comes from trade barriers or domestic subsidies. Japan uses tariff rate quotas (TRQ) to protect its most sensitive products, and reserves the right for trading many of these products (within the quota) for one or two state trading enterprises. However, these extremely protective measures apply only to some products; others are able to compete more effectively with outside competition, often on the grounds of higher quality.

Perhaps the biggest barrier to trade with Japan in vegetable markets is its strict phytosanitary requirements, which have often been challenged in the WTO as having little or no scientific justification . Other measures that are being challenged include Japan's use of fumigation on agricultural products when cosmopolitan pests (already found in Japan) are detected.

Japan is also increasing its labelling requirements. It now (as of 1 April 2000) requires fresh food, including fruit, to be labelled with the place of origin, whilst new technological ('smart') labels that have em-

bedded semi-conductors and information on just about everything are being adopted in various agricultural sectors.

Food containing genetically modified organisms (GMOs) need to be assessed for environmental and food safety by the MAFF or the Ministry of Health, Labour and Welfare (MHLW). At the same time, the MHLW tests food imports for maximum residue levels from pesticides, and as of May 2006, any food with pesticides not on an approved list, regardless of residue levels, are not allowed entry.

Japanese organic definitions changed in 2001 (they roughly corresponded to world standard definitions), and any foreign producers wishing to enter the Japanese market must be certified under Japanese standards (not general world standards).

China also has a massive system of government support for farmers and generally for rural dwellers (who are lagging far behind urban dwellers in terms of income levels). To this end, most of the agricultural sectors are protected and promoted through a series of subsidies, tax cuts and infrastructure spending policies (as well as low-cost loans, research, land use protection, market stabilisation measures, etc.). Part of the protection of its massive farming population, which for the most part consists of small farmers not benefiting from economies of scale, necessarily occurs in the form of high tariffs and other restrictions. However, China is obliged to reduce tariff levels as a condition of being a member of the WTO. It therefore remains to be seen just what policies will be adopted going forward, but the general consensus is that it is a vitally important market to watch, and endeavour to enter.

6. Distribution channels and logistics

6.1 General distribution channels

There are roughly three distinct sales channels for exporting vegetables. One can sell directly to an importer with or without the assistance of an agent (usually larger, more established commercial farms/orchards). One can supply a vegetable combine, which will then contract out importers/marketers and try to take advantage of economies of scale and increased bargaining power. At the same time vegetable combines might also supply large retail chains. One can also be a member of a private or co-operative export organisation (including marketing boards) which will find agents or importers and market the produce collectively. Similar to a vegetable combine, an export organisation can either supply wholesale markets or retail chains depending on particular circumstances. Export organisations and marketing boards will wash, sort and package the produce.

They will also market the goods under their own name or on behalf of the member, including labelling, bar-coding, etc. Most of the time, export organisations will enter into collective agreements with freight forwarders, negotiating better prices and services (more regular transport, lower peak season prices, etc.). Some countries have national marketing boards that handle all the national produce (membership is compulsory) and only sell to a restricted number of selected importers.

Agents will establish contracts between producers/export organisations and buyers in the importing country, and will usually take between 2% and 3% commission. In contrast, an importer will buy and sell in his/her own capacity, assuming the full risk (unless on consignment). They will also be responsible for clearing the produce through customs, packaging and assuring label/quality compliance, and distribution of the produce. Their margins lie between 5% and 10%. The contract importers of vegetable combines market and distribute the produce of the combines, clear it through customs and in some cases treat and package it.

Only a few exporters have long-term contracts with wholesale grocers (who deliver directly to retail shops), but with the increasing importance of standards (EurepGap, etc.) and the year-round availability of fruit, the planning of long-term contractual relationships is expected to increase.

Finally, a new medium of e-commerce is expected to have a significant impact on potential exporters/suppliers and their ability to supply directly to wholesalers/distributors in the target markets. See, for example, www.agribuys.com, www.foodstrading.com or www.hairyape.info/index.html.

6.2 Globalisation and retail consolidation

With fewer constraints and lower transaction costs (especially transport costs), many firms are opting to source produce internationally. Of course this may mean being a multi-national company that produces in one country (owns commercial farms) and then sells the produce in another country, but it could also mean just maintaining relations with foreign companies/organisations/farmers. Traditional importers have no ties to either domestic producers or foreign producers; they simply market the produce – but this state of affairs is changing. Many importers are now simply the marketers of large foreign producer organisations, whilst some companies have divisions that handle the production of the produce, other divisions that package and ship it, and still others that act as sellers, to wholesale outlets or even under their own brand names/retail outlets.

Clearly the whole industry is becoming more globalised, and to meet consumer demands (variety, increased quality, packaging and convenience), companies in some industries will only stay competitive if they expand and compete on a much more integrated level. Examples include Chilean suppliers, who traditionally supplied winter produce to the US markets but are now expanding and producing on farms that they own in the US in order to provide a year-round supply; US companies that conversely own farms in Mexico and Chile for producing and importing produce; or even company mergers to take advantage of economies of scale.

At the same time consolidation in the retail sector has a large impact on buyer/seller relationships, with retailers in the EU, US and Japan now expanding and capturing more of the market than ever before. The large retailers, however, desire large quantities of standardised products that can be supplied consistently and over the long term – no more fly-by-nights or wholesalers supplying markets with whatever produce they can find. If one is able to satisfy the stringent requirements of a large retailer, however, one has access to long-term guaranteed sales and a consistent stream of revenue, which of course assists with financing and planning.

Thus, again, size is likely to count in a farmer's favour. But if the sizes of farms do not lend themselves to such contracts, or generally to economies of scale, this problem could be overcome by producer organisations that act on behalf of the member farmers and pick up, market and distribute the produce collectively.

6.3 Logistical issues

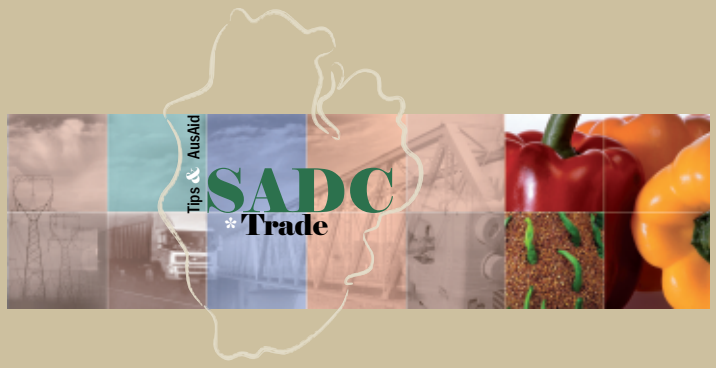
The transportation of vegetables falls within two categories – ***ocean cargo*** and ***air cargo*** – with ocean cargo taking much longer to reach

the desired location but costing considerably less. Of course, the choice of transportation method depends, for the most part, on the fragility of the produce and how long it can remain relatively fresh. With the advent of technology and container improvements, the feasibility, cost and attractiveness of sea transportation have improved considerably. As more developing countries begin to export and supply major developed countries markets, so the number and regularity of maritime routes, and the container vessels travelling these routes, increase. Presently South American countries like Peru benefit from the asparagus trade, which has lead to some level of economies of scale with other vegetable products, and this has enabled cheaper transport prices for their other vegetable varieties. Such economies of scale could benefit SADC countries if more producers became exporters and took advantage of the various ports which have special capabilities in handling vegetable produce (for example, the proposed terminal in Maputo).

For some products, in order to reach the destination market with an acceptable degree of freshness, air transport is the only option (asparagus, for example, is flown from Peru to the US). Obviously, the price fetched on these markets needs to be sufficient to cover the transport costs, and collective agreements between farmers of different commodities with different harvest periods can become particularly important. There are numerous bottlenecks and infrastructural 'weak points' that exist in the SADC region which presently disadvantage (sometimes prohibitively) potential vegetable exporters, and therefore are particularly important to research and be aware of. Often it is these shortcomings that will determine whether one can export profitably, rather than other economical factors or market access requirements.

Cold chain management is crucial when handling perishable products, from the initial packing houses to the refrigerated container trucks that transport the produce to the shipping terminals, through to the storage facilities at these terminals (and their pre-cooling capability), onto the actual shipping vessels and their containers, and finally on to the importers and distributors that must clear the produce and transport it to the markets/retail outlets, etc. For every 10˚C increase above the recommended temperature, the rate of respiration and ripening of produce can increase twice or even thrice. Related to this are the increasingly important traceability standards, which require an efficiently controlled ***supply chain*** and internationally accepted business standards.

Packaging also plays a vital role in ensuring safe and efficient transport of a product and conforming to handling requirements, uniformity, recyclable materials specifications, phytosanitary requirements, proper storage needs and even attractiveness (for marketing purposes).



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