Chapter 5: Drivers of change in South African Agribusiness

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5.1 Introduction

This chapter sets the background for the analysis of the South African case studies. The previous chapters identify the dimensions of the supply chain and the governance structures available to management. The drivers of change essentially constitute the competitive environment in which the agribusiness operate and consequently the strategies that the firm will adopt to maintain and build its competitiveness.

Three main trends are generally recognised in the food system namely the movement away form undifferentiated agricultural commodities towards more specialised products, a movement away from open markets for raw agricultural products towards vertically coordinated of transactions, and a movement towards agricultural industrialisation.

Tom Urban coined the phrase "the Industrialization of Agriculture" at the turn of the previous decade. The term 'agricultural industrialisation' is used to describe to the trend towards economics of scale through the movement to larger production units and the increasing occurrence of vertical cooperation and integration between the various stages of the food and fibre system i.e. the supply chain (Antonovitz, *et al* 1996). Boehlje (1996) defines industrialisation as the application of modern manufacturing, production, distribution and cooperation methods to the food supply chain. Drabenstott (1995) identified the primary changes as a shift from food commodities to food products, and a shift from spot markets to more direct market channels, such as production contracts. The Council of Food, Agriculture and Resource Economics defines industrialisation of agriculture in Sonka (1995) as the increasing concentration of farms and vertical cooperation (contracting and integration) among the various stages of the food and fibre system. The emerging system is expected to be highly competitive in global markets, more efficient, more responsive to consumer demands, less dependent on government assistance, and more able to rapidly adopt new technologies.

"Agroindustrialisation" comprises three related sets of changes: (1) the growth of agroprocessing, distribution and farm-input provision activities off-farm, undertaken by what can be called "agroindustrial firms" or "agribusiness firms"; (2) institutional and organisational change in the relation between agroindustrial firms and farms, such as increasing vertical cooperation; and (3) concomitant changes in the farm sector, such as changes in product composition, technology, and sectoral and market structures. The 1990's heralded a relatively rapid and intense agroindustrialisation in many low- and middle-income countries (Reardon and Barret, 2000; and Cook and Chaddad, 2000)

The trends in agricultural markets can be attributed to three general 'drivers of change' namely the changes in consumer demand; changes in agricultural policy; and changes in the agricultural supply structure. This chapter discuss these three forces in the context of the changes in the South African Agribusiness environment. The first section of this chapter deals with the changes in the consumer market for agricultural produces and the changes in South African agricultural policy. The second part of the chapter is devoted to the views and strategic response of South African agribusiness to the changes in the agrofood sector. The changes in the agricultural supply structure are extensively discussed in chapter 4.

5.2 Changes in the demand for agricultural produce

5.2.1 Consumers and retailers

Expanding production at the hand of improved technology in conjunction with stagnating markets due to low population growth rates in industrialised countries have led to saturated markets. Opportunities for expansion or entry in these highly competitive markets are very scare and many firms are increasingly under competitive and financial pressure. Given these pressures firms are forced to lower their costs and to find innovative ways to provide customer value to enable them to maintain their position in the market. (Fearne and Hughes, 1999; Zuurbier *et al,* 1996; and Boehlje, 1996) Although other markets are increasing in importance, the developed markets have always been an important source of income for South African agricultural and food producers. The United Kingdom, Netherlands, Japan, Mozambique and the United States were the five largest export destinations for South African agricultural

exports in 2001 with export values of R1 936 million, R1 893 million, R1 421 million, R995 million and R944 million, respectively (NDA, 2002). The challenge that saturated markets are posing to agricultural and food producers is not only limited to export markets, but it is fundamentally changing the way agribusiness is conducted. These fundamental changes are permeating the agricultural and food sector from the affluent high-end markets to the economy markets as firms compete to gain market share.

5.2.2 Chain Reversal

Although the term 'supply chain' is generally used, 'demand chain' is actually a much more appropriate term to describe the functioning of the system. Analogous to the change in company orientation towards marketing (Kotler, 2000) from production to marketing, the marketing of agricultural and food products has also evolved. Traditionally the focus of agricultural and food marketing has been on effectiveness and efficiency, or getting products as quickly as possible to customer in sufficient quantities at competitive prices. Since markets have become saturated agricultural and food producers have to find new ways to create customer value as in the case of industrial products. Chain reversal implies that the market or consumer's needs stand central to technological improvement and processes in supply chains. (Boehlje, 2000; Downey, 1996; Drabenstott, 1995; and Zuurbier *et al,* 1996)

5.2.3 New Consumer Demands

Consumer demands is probably the most important driver for change in agricultural and food supply chains. Food quality and assurance is increasingly important to the modern health conscious consumer. Recent food scares have also contributed heavily to the newfound consumer attention to the quality of food. This presents a significant opportunity to food and agricultural chains to establish a competitive position in the market. Consumers with expanded discretionary income are more discerning in their tastes and demand more convenience, variety, and added value as part of the product mix. Consumer value can be created by giving attention to quality and quality assurance, production process, assortment width and depth, consumer service, product information and traceability. Dedicated firms can maintain strong competitive positions by servicing highly defined market niches with specially tailored products, packaging and delivery to meet the needs of these markets. The bulk of agricultural

and food products will require a mass customisation strategy i.e. to provide individually designed products and communication to meet each consumer's requirements on a mass basis. Mass customisation of agricultural and food products cannot be addressed by a single firm and supply chains are challenged to supply mass customised product at competitive prices. The result is a highly fragmented market on the consumer side where agribusiness is serving a large number of distinct niche markets. (Boehlje, 2000; Drabenstott, 1995; Davis and Langham, 1995; Verbeke and Viaene; 2000 and Zuurbier *et al*, 1996)

5.2.4 Societal Values

The topic of the 2002 conference of the International Food and Agribusiness Management (IFAMA) was "Connecting Value with Values". This is not the first time that this topic was addressed at the conference, but the importance given to corporate social responsibility is significant. The annual reports of most international companies are extending their coverage of traditional profit, loss and business trends to include 'corporate social responsibility'. However, maximising shareholder value and spending resources on public ecological and ethical concerns contradicts each other. Agribusinesses are challenged to balance these issues in their supply chain processes (IFAMA, 2002).

International agribusiness is devoting more attention to societal values because consumers are increasingly aware of these issues. This is evident in the increasing popularity of 'green' parties in European politics and the strength of anti-globalisation movement. Consumers are modifying their buying behaviour according to these values. Bax (2002) indicates that 63% of the Dutch population takes corporate governance into account when shopping and 80% of Belgian consumers want information on the circumstances in which products are produced. The critical issues that agribusinesses should address and balance as identified by Eccles (2002) are presented in Table 5.1.

Table 5.1: Ecology, Ethics and Economy in Agricultural Supply Chains

Ecology	Ethics	Economy
• Air, soil, noise, water, light or skyline pollution	• Bribery, corruption	• Cash flow
• Climate change	• Child labour	• Competitive landscape
• (Disappearing) ozone layer	• Civil rights and equal rights	• Profitability
• (Disappearing) biodiversity	• Fair labour conditions	• Solvability
• Exhaustion of natural resources	• Fair trade	• Market growth
• Food safety	• Use of novel technology (e.g. GMO)	• Market share
• (Hazardous) Waste	• Local culture reinforcement	• Market size
• Health/safety (in/external)	• Training, education and development	• Quality/experience of management team
• Refuse (street rubbish)	• Transparency	• Speed to market (first to market)
• Soil erosion and dehydration	• Usage of animals for research	• Strategic direction

Source: Eccles, 2002

Emerging societal values present challenges to agribusiness management, but also opportunities for value adding. The trend towards customer-centred value creation is taking organisations beyond technology or product innovation. Measuring customer and societal satisfaction is critical to the process of serving the customer and society. This will enable agribusinesses to respond faster and better to customer needs than competition. (Goddijn and Ziggers, 2002) These values are not tangible and will increase the need for traceability, assurance and transparency (5.2.9).

5.2.5 Concentration

The market structure for food and agricultural products is also subjected to a significant evolution. At the retail level companies have been growing and amalgamating into mega businesses - true super markets. A larger market share implies improved economics of scale, higher turnovers, higher margins, and a stronger procurement position. However, these firms are challenged to be big and scale efficient as well as flexible enough to respond to changing customer requirements. (Zuurbier *et al*, 1996)

A significant degree of concentration is taking place at the retail level as multiples compete intensively for market share. The only market growth that the retailers can

achieve is a result of increased expenditure rather than new customers. This is due to the expansion of the food retailing sector in the late 1980's early 1990's into the markets of independent retailers (butchers, bakers and greengrocers) which leaves very little scope for market expansion. As a result retailer strategies have moved away from location and size dominance to product differentiation and own labels. (Fearne and Hughes, 1999).

5.2.6 Consumer demand meet concentration

Consumers, and especially affluent consumers, are highly sensitive to the safety of agricultural and food products. In order to build a competitive position in the market food industry firms launched private labels to satisfy consumer demands for the safety and quality. Food manufacturers, distributors and retailers invested massive amounts of money to build brand recognition and trust with consumers. Information and communication technology enables consumers to communicate the news (or rumours) of chemical or drug contamination or disease outbreaks virtually instantaneously. This can cause enormous damage to a brand, firm or an entire market in a very short timespan. The name of the food industry firm is invariably attached to a private label product and a breach of trust with the consumers can severely compromise the firm in the highly competitive retail market. Food industry firms are therefore extremely set on product standards and quality and exploit their market power to exert considerable pressure on their suppliers to ensure the best (lowest) prices and assured quality standards for their private label products. Similarly, some food industry firms attempt to build differential advantage upon unique qualities of their products. These qualities can usually only be provided and assured through high levels of selectivity and care in the production process.

5.2.7 Biotechnology

Technological advances, and specifically in biotechnology, are providing new opportunities for competitive positioning to agricultural and food producers. Genetically Modified Organisms (GMOs), which is only a small component of biotechnology, are usually designed to induce two categories of characteristics namely lower farm-level production costs (e.g. pest resistance) and or to enhance product quality (e.g. nutritional content, storage characteristics, product appearance). Global positioning systems, preventative animal health programs, complex and safer

agrochemicals will all contribute to the productivity and differentiability products supplied by farmers to the system. Improved supply chain management will be required to ensure the management and provision of differentiated products to the consumer. The provision of GMO free products to the European markets for example, will require supply chain management systems verify and certify these products.

5.2.8 Communication and Information Technology

Communication and Information Technology provide numerous new opportunities for management and control systems. Electronic communication is nearly instantaneous and removes spatial barriers, enabling managers to monitor production, transportation, inventories, and consumer preferences very fast and accurately. This data is utilised to optimise logistics management in the supply chain in order to lower stocks, product losses and out-of-stock costs. Fresh produce especially, is placed under considerable pressure due to the perishable nature of these products requiring low inventories, frequent replenishment and stringent quality control. The ability to measure more precisely and track product and processes more easily increases the accountability of each actor in the supply chain for their contribution to the final product. The implementation of these processes in agricultural and food chains therefore requires considerable cooperation between actors in the chain. (Downey, 1996)

5.2.9 Traceability, transparency and assurance

The issues of traceability, transparency and assurance are closely linked to the new emerging demands of consumers and communication and information technology. Traceability is also called identity preservation and is the ability to track the identity of a product backwards from retail through the different stages of production. Transparency is the availability of information to consumers regarding the processes used at each stage of the product's creation. Assurance is the monitoring and of the food chain for safety by means of product tests and process audits. (Dickson and Bailey, 2002) There are numerous reasons for the emerging importance of traceability, transparency and assurance, but the impact of consumer's health consciousness and safety sensitivity is considered the single most important driving force for the implementation of these systems (Verbeke, Doyer and Visser, 2002). Traceability, transparency and assurance represent and important source of value

adding to improve a company's competitive position in the market. These activities require system or supply chain wide coordination of the activities of each of the actors at each stage of the product's creation.

5.2.10 Synopsis

The drivers discussed in this section are some of the most significant reasons for the emergence of supply chain management in the agricultural and food sector. The most important driver is consumer demand, supported by the pressure on retailers to innovate to maintain and expand their market share. The actors in the supply chain utilise technology, especially biotechnology and information and communication technology to create product differentiation and competitiveness in the retail market. These processes require coordination across the different actors in supply chains to deliver products of superior value. However, these drivers are generic drivers putting pressure on just about every food supply system in the world. The South African political economy and agricultural sector has also experienced substantial changes over the last ten year. These changes and their impact on local supply chains are discussed next.

5.3 The South African situation

5.3.1 Introduction

Food and agricultural policies continue to play a major role in the evolution of the food and agricultural system. The demise of the control board system in South Africa left a vacuum in the cooperation of product allocation and food and agricultural system governance. Actors in supply chains are now faced with new opportunities within a more flexible marketing system like expanded opportunities for product differentiation, but also challenges due to higher risk exposure in the free market. The co-ordinating role of government is being replaced with alternative governance systems.

In addition lowering trade barriers under WTO agreements acts as a double edged sword. On the one hand new market opportunities are presented to the South African agricultural and food systems, but on the other hand, multinational firms are entering domestic markets with new strategies and abilities changing the nature of the

competition in these markets. Local firms have to develop and implement new strategies to compete successfully with powerful and resourceful international companies. These firms are able to procure products from almost any country in the world by means of efficient and effective supply chains. Domestic producers are not only competing against each other any more, but against international producers. Globalisation presents new market opportunities to the South African food and agricultural system. New markets will require particular strategies and processes to serve the diverse requirements of the consumers in these markets. The agricultural and food system can source material from anywhere in the world, obtaining the best price and quality inputs. Bigger markets will create new opportunities to realise economics of scale and scope in manufacturing and distribution of produce.

The creation of trade blocks present additional and more competitive resources to actors in the agricultural and food complex. However, new skills, processes and strategies will be necessary to utilise these resources optimally. The government's role is imperative to the creation of a vital Southern African trade block in terms of the political establishment of the trade block, but even more to establish and maintain an enabling infrastructural environment.

5.3.2 The evolution of South African agricultural policy

The nature of South African agricultural sector and especially the marketing of agricultural produce has changed fundamentally over the last two decades. Various authors have recorded this process extensively (Van Zyl, Kirsten and Binswanger, 1996; Vink and Kirsten, 2000; and Bayley, 2000). This process has not proven to be an easy one. The complexity of issues related to new marketing systems, institutions and relationships require innovative approaches and research programs.

Governments throughout the world are involved in the marketing of agricultural products. The degree of statutory involvement rose sharply in the 1930s due to the worldwide depression where consumers were out of jobs and farmers saw their produce perish in storage, as there was nobody that could by their products. The public were disillusioned by the "invisible hand of the market" and wanted government to intervene to ensure their economic well being (Lombard, Du Pisanie and Steyn, 1986). The South African economy and agricultural sector was no

exception (Bayley, 2000). The political-economical cycle provides a framework to gain insight into the evolution of the political economy and eventual government involvement in the South African agriculture.

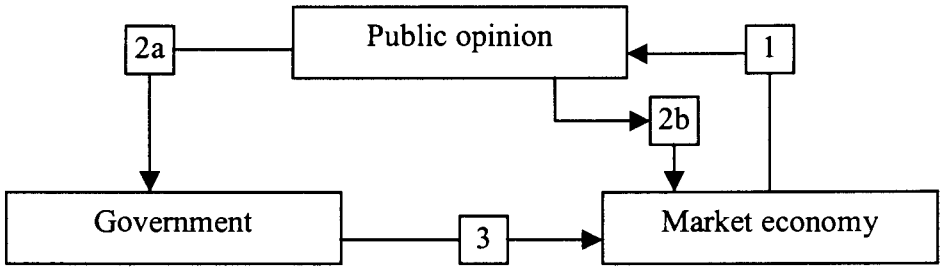


Figure 5.1: The Political-Economical Cycle

Source: Lombard *et al* (1986)

The market economy is a collection of processes regulated by the price mechanism in which private firms are involved. The government is a collection of political processes, autonomous or collective in nature. Public opinion is a collection of information processes that yields a collective opinion. These three elements interact in three dimensions. The first dimension (1) is the result of the mixed market system, which is evaluated by public opinion. Important issues in this regard are for example food prices, commodity prices, market access and distribution of land ownership (Vink and Kirsten, 2000, Bayley, 2000, Mbongwa *et al* 1996). The nature and extent of government involvement in the market economy is influenced by different ideological approaches to addressing the results of the market economy. The second dimension (2a and 2b) concerns the influence that public opinion has on the government (2a) and on the market economy (2b). The efficacy of public opinion on government policy (2a) depends on the prevalent political system i.e. dictatorship, democracy (federal or unitary). Public opinion also influences the market economy directly (2b). This does refer to individual action like consumer resistance to certain products, but rather to collective action like strikes. The importance of this dimension decreases as the efficiency of political dimension (2a) increases. The final dimension is that of government involvement in the market economy. The most important issue in this dimension is the extent of involvement. Direct involvement implies that the government disregards all pretences of a market economy, while indirect involvement would be market orientated (Lombard *et al* 1986).

Agricultural policy in South Africa was guided to a large extent by the general political and economic philosophy of white domination or apartheid. The result of these policies included distorted output and input markets, land and labour markets, infrastructure, agricultural credit services, and the creation of large-scale farms in the hands of white owners (Mbongwa *et al* 1996).

The evolution of South Africa's agricultural political economy can be divided into five main periods namely (Mbongwa, 1996; Vink and Kirsten, 2000; and Bayley, 2000):

- Pre 1900
- Segregation and support – 1910-1947
- 1947 – 1980
- 1980-1994
- Post independence 1994-

These are discussed in more detail in the next section.

5.3.3 Pre 1900

The agrarian economy of South Africa in the 1800's was divided into two main geographic sub-sectors namely coastal and interior farming. Coastal farming included horticulture, livestock and crop farming. Wool, wine, hides and ostrich feathers were exported to Europe. Interior farming was mostly subsistence-based. Livestock farming, by indigenous farmers who produced for home consumption and engaged in surplus marketing to a limited extent, was the primary agricultural system in the interior. Trade between the two regions consisted of livestock, hides and ivory in exchange for guns, ammunition, textiles and transport equipment (Bayley, 2000; and Mbongwa *et al*, 1996).

The discovery of diamonds in 1867 and gold in 1886 in the interior revolutionised the structure of the South African economy. Large and rapidly growing urban areas were developed around the mining areas with the associated demand for food and agricultural products. (Mbongwa *et al*, 1996; and Bayley, 2000).

5.3.4 Segregation and support: 1910-1947

The Union of South Africa was established in 1910. British interests and policies revolved around gold mining and related economic considerations. The mines' requirement for cheap labour was prominent in this regard. Britain also desired political stability after the war and actively pursued improved relationships with the large Afrikaner landowners. The political economy centred around two central and interrelated themes (Bayley, 2000):

- The political and economic deprivation of the African population; and
- The attainment of, and effort to maintain, a symbiosis between the (Afrikaans speaking) state and (English speaking) capital.

The Great Depression and South Africa's delay in coming of the gold standard resulted in lower agricultural prices. This paved the way for stronger lobby groups in agriculture with popular support, which led to the promulgation of the Marketing Act of 1937 (Bayley, 2000).

The expansion of statutory control in over agricultural marketing in this period can be divided into three phases (Bayley, 2000):

- commodity-specific controls were instituted during the 1920s in respect of three commodities – wine, sugar and tobacco;
- commodity-specific interventions expanded during and following the Depression (1930-1936), affecting maize, wheat, livestock, and dairy products; and
- marketing controls were extended, initiated, and managed in terms of the 1937 Marketing Act.

The Marketing Act of 1937

The Marketing Act of 1937 was a consolidation of governmental support to agriculture. Before 1937 State intervention in agricultural marketing was disaggregated and on an *ad hoc* basis. The 1937 Act was the cornerstone of commercial agricultural marketing and policy as the Act was structured to be the most important instrument for State involvement/intervention in agriculture (Vink and Kirsten, 2000).

Bayley (2000) cites the following motivation for the Marketing Act of 1937 by De Swart, who is generally recognised as the architect of the legislation:

- The inelastic demand for agricultural products meant that relatively small changes in the level of supply resulted in relatively large price movements;
- South Africa agricultural production was vulnerable to signidficant supply shocks due to the weather and the sector's relative isolation form international markets;
- Importing, exporting and storage was risky in as situation of imperfect knowledge about market conditions;
- Market imperfections resulted in significant differences between the prices attained in overseas markets and domestically; and
- The resulting speculation and suspicion of market manipulation, led to widespread dissatisfaction amongst producers.

He furthermore argued that stable prices throughout the year, and a marketing authority with statutory powers including the ability to store and finance surpluses, and to control imports. The problems facing the agricultural sector has become too involved to be handled by thousands of ill organised and financially weak individuals with conflicting interests. He proposed that prices be determined by a small body of responsible men equipped for the task and in possession of all the necessary facts and statistics. (De Swart in Bayley, 2000).

The extent of the statutory and executive powers of the Marketing Act as implemented by the control boards is evident when the interventions that were provided for in the Act are considered (Bayley, 2000):

- the placing or prohibitions on the sale of a commodity by farmers or the purchase of a commodity by trader and processors;
- the placing of conditions or prohibitions on the import or export of an agricultural commodity;
- the conducting and financing of pools;
- the collection of levies to pay for the operations of, and interventions by, the regulatory board;

- the appointment of agents to act on behalf of the board;
- the prohibition of the manufacturing or processing of an agricultural product except with a permit; and
- the fixing of margins for the manufacturing and processing of agricultural commodities.

By 1961 more that 90% of the agricultural production (farm value) was subject to statutory control. The majority of the controls (on 73% of production) were managed by 17 marketing schemes under the auspices of the Marketing Act. The balance of the products (18%) were managed under commodity specific legislation (Bayley, 2000).

5.3.5 Consolidation to Maturity: 1947-1980

In 1948 the National Party defeated the United Party. This victory was partly (but not mostly) due to way the United Party government managed the marketing of agricultural produce. The previous government used the Marketing Act of 1937 to control the price and supply of agricultural produce in the wartime. Farmers received prices that approximated estimated production costs and did not reflect the actual scarcity value of the produce. This led to some dissatisfaction in the rural constituencies which also influenced voting (Bayley, 2000).

The South African economy grew at about 5% per annum until the 1970's after which it grew at about 3% per annum until the 1980's. These growth rates were higher than the population growth rate during this period. However, the economy, and especially agriculture, suffered a high rate of inflation and increasing concentration in the agro-industrial complex. At the beginning of the 1980's these policies had created an unsustainable situation and the agricultural economy badly needed revision.

5.3.6 Maturity to independence: 1980-1994

Given the challenges to the sustainability of the agricultural policies the sector underwent increasing deregulation and market liberalisation seemingly without any stated policy. The most immediate impact from this policy were the decline of the value of the Rand and increasing capital costs. Changes in the reserve requirements by the Reserve Bank made it impossible for the Land Bank to continue subsidised

interest rates for the farming sector. Labour policy was also amended to allow the free movement of labour. The deregulation of the food sector implied increasing activity in the informal sector. The formal sector also benefited form the deregulation and responded with new product and service offerings.

The trade policy reform is of particular significance to the marketing of agricultural products. The trade policy reform was aimed at undoing the decades of 'inward industrialisation' strategies. The Marrakech Agreement called for the tariffication of all agricultural produce as opposed to quantitative measures, and a phased reduction in the tariffs. South Africa reduced its tariffs at a rate faster than required by the Uruguay Round of the Global Agreement on Tariffs and Trade (GATT). The government also negotiated new agreements with the Southern African Development Community (SADC) and the European Union. South Africa is also a member of the Cairns Group which supports the unilateral liberalisation of agricultural trade regardless of the actions by developed countries (Vink and Kirsten, 2000). The net effect of these changes is that the South African agricultural sector is exposed to the vagaries of international markets.

5.3.7 Post-independence 1994-

The main characteristics of the governments new approach were (Bayley, 2000; and Vink and Kirsten, 2000):

- the implementation of GEAR (Growth, Employment, and Redistribution) strategy which was a competitive and outward orientated approach to generating sustained growth;
- currency controls were relaxed;
- free trade and preferential access agreements were sought with, amongst others, the European Union and Southern African States;
- the Labour Relations Act shifted the power balance in favour of labour;
- the commercialisation of parastatals such as Telkom, Transnet and Eskom was initiated; and
- South Africa started to implement WTO commitments.

Within this framework the Marketing Act of 1996 was promulgated. The objectives of the Act were:

- Increased market access for all market participants;
- The promotion of efficiency in the marketing of agricultural products;
- Optimisation of export earnings form agricultural products; and
- Enhancing the viability of the agricultural sector.

The Act was aimed at enabling farmers to stand together to stabilise agricultural prices. Co-operation without state intervention would cut out unnecessary duplication in the marketing which would lower the cost of getting the produce to the consumer in the desired form, time and place (Vink and Kirsten, 2000).

Interventions or government involvement in the agricultural sector should reflect the governments policy goals. The initial presumption was in favour of non-intervention. The responsibilities of the National Agricultural Marketing Council (NAMC) was to advise the Minister of Agriculture on the implementation of the Act. The NAMC was to consultative procedures in the execution of its responsibilities. The NAMC was to be constituted in such a way as to ensure that the statutory advice is based on expertise rather than the interests of particular interest groups (Vink and Kirsten, 2000; and Bayley, 2000).

The promulgation of the 1996 Act heralded the cessation of statutory intervention in agriculture. New players emerged on the markets and familiar institutions vanished.

5.4 Co-operatives: The Agents of the 1937 Marketing Act

Special attention is devoted to the co-operative sector since this sector was extensively involved in the marketing of agricultural produce as agents of the marketing boards. By the mid-1990's co-operatives handled the vast majority of the agricultural production in South Africa. The extent of the involvement of co-operatives in South African agriculture can be observed in Table 5.2. About 250 co-operatives held assets valued at R12.7 billion with a turnover of approximately R22.5 billion in approximately 1200 branches throughout the country and employed approximately 70 000 people (ABC, 1998 and Bayley, 2000).

Table 5.2 The Extent of Co-Operatives in the South African Agricultural Sector (1990)

Product	Involvement
Deciduous and citrus fruit export	100%
Wheat	98%
Maize	93%
Wool	100%
Sunflower	90%
Dried fruit	90%
Tobacco	100%
Wine	86%
Production financing	90%
Fuel	85%
Agro-Chemicals	65%

Source: Bayley, 2000

Co-operatives established this strong presence as agents for the marketing control boards. The massive growth of the co-operative movement can be ascribed to Government support. The following instruments were applied by the Government to support co-operatives (Bayley, 2000; and Vink and Kirsten, 2000):

The Land Bank Act of 1912

- subsidised interest rates to farmers and co-operatives
- this finance was only available to farmers and co-operatives
- these interest rates gave co-operatives a competitive advantage in the input supply and marketing of agricultural produce as they had access to cheaper credit and capital

The Co-operatives Act of 1922

- legislative framework for establishment of limited liability organisational structures
- farmers that owed money to the co-operatives were bound by legislation to delivering their produce to the co-operative
- cheap credit from the Land Bank therefore enabled co-operatives to oblige farmers to deliver their produce to co-operatives

The vesting of statutory marketing powers in agricultural co-operatives

- several co-operatives enjoyed statutory marketing powers for products like ostriches, wine and tobacco

Representation on the control boards

- co-operatives were appointed both as farmer representatives and as agents of the marketing boards on the marketing boards

Control board appointment and remuneration policies for their agents

- marketing boards favoured the appointment of co-operatives as marketing agents
- financing costs of the co-operatives in the execution of their activities were reimbursed by the control boards
- remuneration and appointment of agents favoured co-operative structures
- non-cooperative business found themselves in a weak competitive position in relation to co-operatives given the preferences of the boards and subsidised credit supplied to co-operatives

The silo building program

- the silo building programme allowed co-operatives to build up huge structures (with excess capacity)
- legislation prevented silo building by organisations other than co-operatives

Direct financial support from government

- some co-operatives received direct government support to see them through financial difficulty

Competition policy

- co-operatives were not subject to the provisions of the Competition Act
- the Co-operatives Act determined boundaries for the co-operatives, rendering co-operatives as regional monopolies

Tax status of co-operatives

- prior to 1977 tax was only levied on business with non-members
- after 1977 normal companies tax of 35% was levied
- co-operatives still enjoy special treatment in terms of capital investments and depreciation

Channelling of drought relief through co-operatives

- statutory emergency relief was channelled through co-operatives
- the support of farmers by the government benefited co-operatives indirectly by ensuring a market for agricultural inputs and a supply of products to market

5.5 The Impact of the Marketing Act of 1937 on structures in the Agricultural Sector

The Marketing Act of 1937 had, amongst others, the following consequences (Vink and Kirsten, 2000):

- Beef marketing quotas at the controlled abattoirs resulted in an increase in retail processing and a decrease in producer processing in uncontrolled abattoirs. Large farmers mostly sold at controlled abattoirs as they were able to obtain permits while small farmers sold at the uncontrolled abattoirs.
- Co-operatives were generally appointed as the agents of the marketing boards. This arrangement effectively instated the co-operatives as regional monopolies. Farmers were paid a fixed price regardless of the point of delivery. This resulted in substantial cross-subsidisation from farmers close to markets to those far away.
- The maize scheme resulted in substantial transfers from consumers to producers.
- The implementation of the 1937 Marketing Act distorted the location of capital intensive agro-processing. Berning and Potgieter (1998) noted in this regard that a substantial number of Free State cattle were processed outside the province.

The restrictive licensing of agricultural processors under the 1937 Marketing Act enabled a small number of large-scale agro-processing companies to dominate the processing and marketing of agricultural products. The effect on the milling and baking was summarised by NAMC in Bayley (2000) as:

- The number of registered bakers had fallen from 663 in 1941 to 464 in 1962;
- Millers were taking over bakers at 'excessive' prices with a view to securing a market for their flour, so that there was an increasing danger of a monopoly situation developing;
- In the Witwatersrand three milling groups accounted for 77% of bread production; and
- In certain urban areas bakers were co-operating to such an extent that they were subjecting themselves to production quotas.

The South African Government effectively controlled the marketing of agricultural products of the last six decades. This intervention was justified in terms of factors such as the strategic performance of the sector, the need to stabilise an inherently unstable sector, and to ensure the sustainability of the rural areas in South Africa. The implementation of the Marketing Act had several consequences. The most relevant to the topic of supply chain management are the system of market agents that led to the dominance of the agro-processing sector by a small number of large-scale firms and the use of the marketing controls as vehicles for rent-seeking.

The deregulation and liberalisation of the agricultural sector saw the demise of the marketing boards. In the process of liberalisation all the agricultural marketing boards or state trading organisations were abolished. These marketing boards used to direct the marketing functions in the marketing of agricultural produce to a greater or lesser degree. Farmers and the agribusiness sector therefore never had a direct responsibility in marketing their produce. Most of the functions of these boards were taken over (are in the process in some instances) by the private sector. These functions include to a greater or lesser extent:

- Price formation
- Risk management
- International marketing

- Distribution decisions
- Information supply
- Location of production and processing activities
- Marketing programs and strategies
- Grading and quality standards
- Product procurement
- Management of supply chains
- Decision on the scope and scale of operations

When the marketing boards were abolished producers had to devise and establish new institutional structures and arrangements to govern the marketing of food and fibre products to replace the functions and institutions of the marketing boards (Bayley, 2000; Vink and Kirsten, 2000). The next important influence resulted from the liberalisation of agricultural trade. South African farmers were exposed to international competition in domestic markets and new opportunities on international markets. International food and agribusiness trends became a reality to South African markets.

The deregulation and liberalisation of the South Africa agricultural sector exposed farmers and agribusiness alike to international trends. These actors have to be competitive in order to survive in domestic and international markets.

5.6 South African Agribusiness Strategic Response

Some evidence of the strategic response to the deregulation were already evident in two reports by Vink and Kirsten (2000), and a section 7 committee report on the impact of the deregulation process on the wheat to bread value chain (NAMC, 1999).

Vink and Kirsten (2000) examined the registration of new companies in the agribusiness complex in order to investigate the private sector response to reduced government involvement. The reduced government involvement necessitated private companies to replace the functions previously performed by state departments and marketing boards. Vink and Kirsten (2000) argued that these new business enterprises are more efficient in their service delivery than state and parastatal

institutions. The new enterprises would also present a more diverse set of services to agriculture, create a range of new value added products and engage in export activities.

The increase in registration of new companies after the deregulation period (approx. 1990-1994) can be observed in Figure 5.2. Company registrations increased due to the deregulation process and the newfound confidence in the South African economy after the democratic elections in 1994. The number of companies registered per annum increased rapidly since 1985, but the fastest growth is observed after 1994.

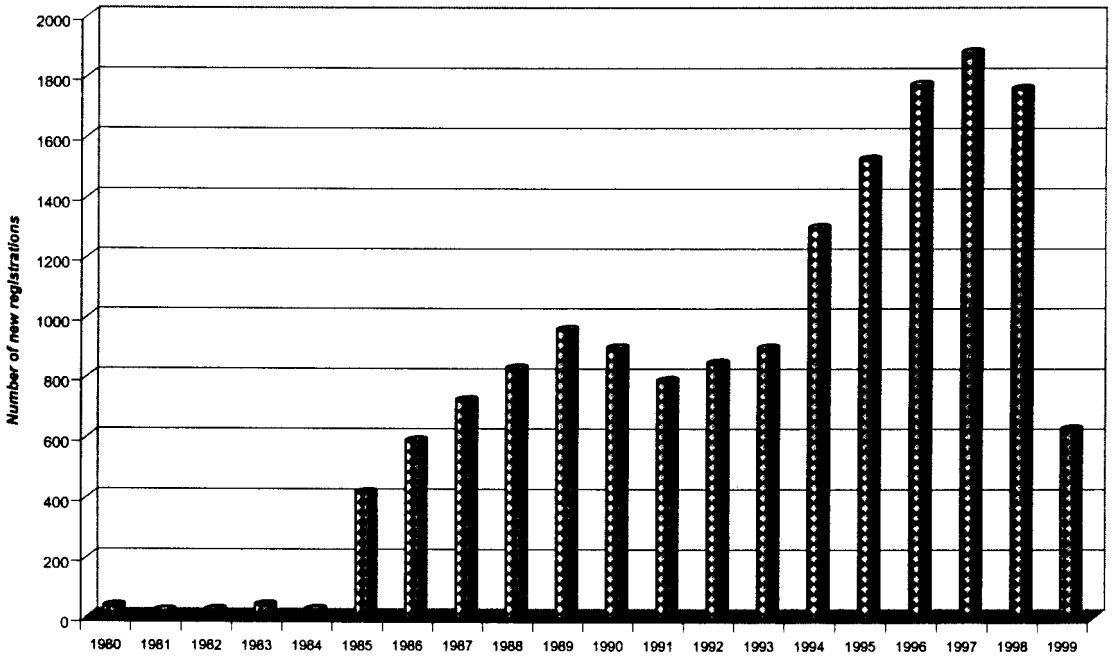


Figure 5.2: Annual New Company Registrations in the Agricultural Sector: 1980 – 1999*

* 1999 figure is only up to March.

Source: Vink and Kirsten, 2000

The deregulation of the wheat sector is also visible in the change of the margins earned by the different players in the bread supply chain. The wheat control scheme was promulgated in 1937 and terminated in 1997 and quantitative wheat import controls were lifted in 1995. The Wheat Marketing Board consisted of seven farmer-, two miller-, one processor-, one baker- and one consumer representative(s) (Wheat

Board, 1993). The shift of power is already evident in the wheat to bread value chain. The share in retail prices by the various role players in the retail sector shows significant changes over the last ten years as presented in Tables 5.3 and 5.4. The shares in retail prices of bread in the downstream activities i.e. production, infrastructure and milling declined significantly while the shares of retailing and baking increased. This shift in relative share can partly be ascribed to the loss of producer's power due to deregulation, and partly to increasing capital costs and expanded product ranges offered to consumers. (NAMC, 1999)

Table 5.3: Percentage Share in the Retail Price of White Bread

Roleplayer	1990/91	1996/97	1998/99
Producer	33.3	24.2	17.9
Infrastructure	6.7	3.3	4.4
Miller	16.7	10.8	9.8
Baker	40.0	42.0	43.9
Retailer	3.3	7.4	11.8
Government	0	12.3	12.2
Total	100	100	100

Source: NAMC, 1999

Table 5.4: Percentage Share in the Retail Price of Brown Bread

Roleplayer	1990/91	1996/97	1998/99
Producer	32.4	23.4	16.7
Infrastructure	6.7	3.8	4.1
Miller	20.9	15.7	12.6
Baker	36.2	46.0	46.3
Retailer	3.8	11.1	20.3
Government	0	0	0
Total	100	100	100

Source: NAMC, 1999

5.6.1 South Africa Agribusiness Survey

A survey to determine the views of agribusiness managers on the shape and drivers of the South African agrofood complex was done in 2001. The survey consisted of six sections namely general information, coordination preferences, strategic direction, strategic focus areas, shape of the agrofood industry, and major factors driving these trends. The survey was mailed to approximately 450 CEO's and managing directors of agribusinesses. A total of 124 questionnaires were received back, of which 94 were usable. This represents a satisfactory response rate of 20.89%. The distribution of responses from the different agricultural sectors is presented in Table 5.5. The contribution of each of these sectors to the gross value of agricultural production is included in Table 5.5 to compare the response distribution to the actual contribution of these sectors. The survey is relatively underrepresented in the livestock section and over represented in the field crop sector. The overall distribution is however satisfactory.

Table 5.5: Response Distribution and Contribution of the Different Sectors to the Gross Value of Agricultural Production in South Africa (1999/2000 season)(%)

	Survey distribution	Contribution to gross value of agricultural production
Field crops	43.6	31.4
Horticultural crops	30.9	26.8
Animal products	25.5	41.9

Source: Own survey and NDA, 2001

Agribusinesses participating in the input supply (44.7%), production (9.8%), processing (17.9%), and marketing (27.6%) functions of the supply chain were represented. The over representation of the input supply function is of some concern.

5.6.2 Growth strategies and coordination preferences

The Ansoff product-market expansion grid is a useful framework to elucidate intensive growth strategies. This matrix is presented in Figure 5.3.

	Current Products	New Products
Current Markets	1. Market penetration strategy	3. Product development strategy
New Markets	2. Market development strategy	(Diversification strategy)

Figure 5.3: Ansoff's Product-Market Expansion Grid

Kotler (2000)

Agribusinesses can opt for one of three intensive growth strategies. The first is the market penetration strategy where the firm attempts to gain more market share in current markets with current products. The second is the market development strategy where the firms attempts to enter new markets with existing products. The third is the product development strategy where the firm attempts to develop products of interest to its own market. The diversification strategy is not seen as an intensive growth strategy as the opportunities are found outside of the current business. South African agribusinesses' growth strategies for the future is mostly centred around the market penetration (35% of all agribusiness managers) and market development (35%). The strategy of agribusiness in South Africa is therefore to use current products to penetrate current and new markets. Only 18% of the managers indicated that they would follow a product development strategy in future with 12% opting for the diversification strategy. When the matrix is considered in terms of the product and market dimension it is interesting to note that the division of the strategic focus between current and new products is respectively 70% and 30% and the division between current and new markets is respectively 53% and 47%. Agribusiness managers will therefore focus more on new markets than the introduction of new products.

The purpose of the questionnaire was to determine whether supply chain management practises were being implemented in the South African agribusiness complex. It is therefore important to determine whether the strategies discussed above will be implemented independently of in cooperation with other enterprises in the supply chain. 47% of agribusinesses indicated that they will implement their strategic direction for the future in cooperation or partnership with other enterprises. 43% indicated that they will base the implementation on their own competences, 8% indicated that they will take over or merge with other companies while 2% indicated other strategies for implementation. It is clear that there is a clear trend towards cooperation and coordination in South African agribusiness supply chains.

Agribusinesses were asked to indicate their current and future coordination preferences according to the coordination continuum suggested by Peterson, Wysocki and Harsh (2001) namely spot/cash market, specifications contracts, relations-based alliance, equity-based alliance, and vertical integration. The most popular coordination mechanism for South Africa Agribusiness is the specifications contract, followed by the spot or cash market. There is a clear trend towards the right of the vertical coordination continuum, although the managers indicate that vertical integration will be reduced in future. These results are according to expectations and it shows that South African agribusinesses are re-engineering their coordination mechanisms to be more responsive and better controlled. This implies that agribusiness governance or coordination systems will increasingly be based on mutual interest, long-term relationships, shared benefits, open information sharing and interdependence according to the Peterson, Wysocki and Harsh (2001) continuum (see 4.3.3). In the Williamson paradigm this will imply that firms will increasingly engage in asset specific investment. This graph clearly illustrates the trend in the emergence of supply chain management in the South African agribusiness sector.

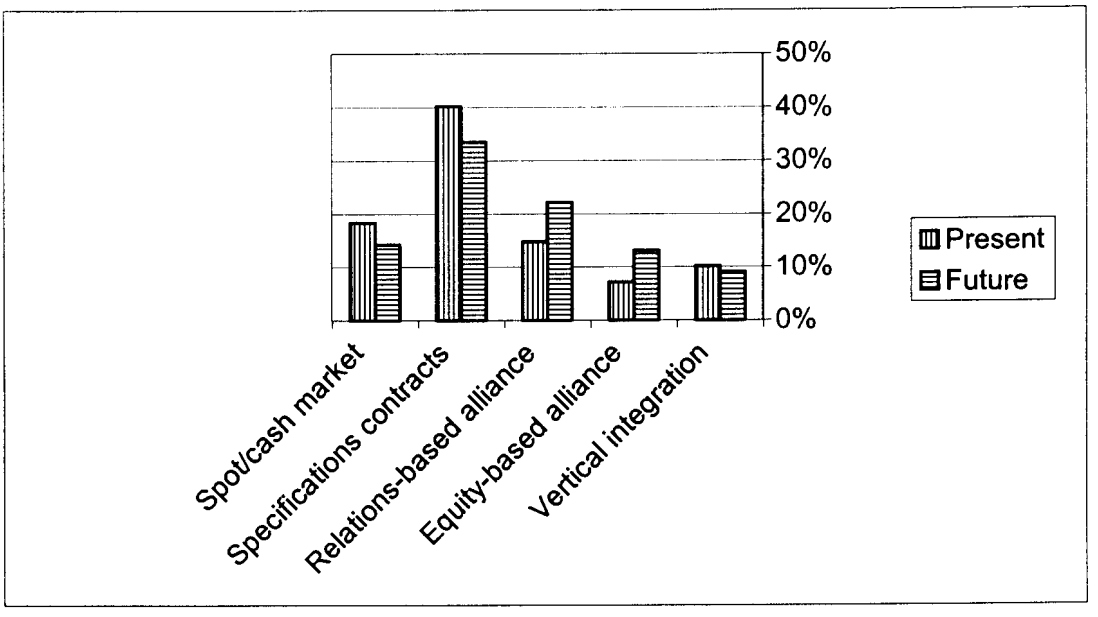


Figure 5.4: Coordination Preferences of South African Agribusiness

Source: Own survey

5.6.3 Strategic focus areas of South African agribusiness

Porter (1980) identified three generic strategies for competitiveness by the firm namely overall cost leadership, differentiation, and focus. The same strategies are employed by various authors in the supply chain management discipline (see Hagelaar, Horbeek, Spee and Don, 1998; and Champion and Fearne, 2001). Zuurbier (1999 a) proposes four strategy drives for firms along the lines of the previous strategies namely:

1. The cost drive – through economics of scope, economising downstream and upstream coordination costs, and a improved scale economics.
2. The value adding drive – similar to the differentiation drive and especially the development of products with bundles of attributes close to new consumer claims.
3. The power drive – building market share through horizontal and vertical expansion, increase profitability, guard risk profile, portfolio of produce that establish differentiation as the basis for successful competitive advantage.

4. The surf drive – integrating new developments in information and communication technology into business systems to facilitate the change from mass customisation to mass individualisation, electronic markets and expanded tracking and tracing capabilities.

Table 5.6: Importance (% choice) of Strategic Focus Areas to South African Agribusiness

Priority	Cost	Value-adding	Power	Surf
1	49 (23)	30 (42)	37 (46)	2 (9)
2	23 (28)	38 (29)	30 (26)	3 (12)
3	25 (26)	28 (24)	30 (22)	7 (20)
4	3 (23)	4 (6)	3 (7)	87 (59)

Numbers in brackets represent future priority

Source: Own survey

The importance of the cost drive or strategy to South African agribusiness firms can be observed in Table 5.6. The power drive is currently second to the cost drive, but the agribusiness managers expect power to be the most important drive in future as they reposition themselves in the market. This is also apparent in the importance of the critical performance areas to the managers as observed in Table 5.7. The optimisation of profitability and risk profile and expanding market share, part of the power drive, is followed by better accounting systems to control costs. The value adding or differentiation drive is never far behind as this is the basis on which the other strategies can be driven. The surf drive is not seen as an important strategy for agribusinesses. The only aspect of the surf drive that enjoys some popularity is the business to business linkages.

Table 5.7: The importance of Core Performance Areas in Strategic Focus Areas

Core Performance Area in Strategic Focus Area	Strategic Focus Area *	Score**
Optimising profitability and risk profile	P	6.34
Increasing market share	P	5.73
Accounting systems to control costs better	C	5.72
Developing new value-added products	V	5.48
Value-adding to address unique customer requirements	V	5.46
Developing and presenting a diverse portfolio of produce	P	5.30
Coordinating with downstream companies to ensure better service/products	C	5.24
Coordinating upstream to plan and implement marketing strategies	C	5.21
Providing new and more convenient products to customers	V	5.15
Strong competition with other supply chains	P	5.15
Computer systems linked with suppliers and buyers	S	4.83
Always buy produce at lowest possible prices	C	4.80
Rationalisation of business	C	4.28
Selling products on electronic markets	S	3.70
Providing agriculture and food products over the internet	S	3.38

* C = cost drive; V = value adding drive; P = power drive; S = Surf drive

**Likert scale 1 (least important) - 7 (most important)

Source: Own survey

5.6.4 Shape of the agrofood sector

It is clear from Table 5.8 that most agribusiness managers agree that electronic markets will dominate the shape of the agrofood sector in future. The next seven factors all indicate shorter supply chains, stronger networks, and closer cooperation between bigger companies, also on a global scale. Small companies and cooperatives will have a negligible effect on the shape of the sector in future. Agribusiness managers feel that there will be more trust and less opportunism in the market indicating a new approach to interaction with other players in supply chains. Virtual networks do not feature as an important factor as opposed to increased use of electronic markets. These figures are compared to an unpublished survey conducted by Zuurbier (1999 b) in Table 5.9.

Table 5.8: The future shape of the South African Agrofood Sector

Factor determining the shape of the agrofood sector	%
Electronic markets	73
Vertically integrated supply chains	72
Mergers, acquisitions and collusion between companies	71
More direct marketing from farmers to consumers	67
Closer co-operation between agribusiness and international commodity trading organisations	63
Networks of companies	63
Closer co-operation between agribusiness and input supplier companies (e.g. fertiliser companies)	61
Increase in global agribusiness networks	61
Increase in global companies	59
Larger scope in companies	54
Input supplying companies dealing directly with farmers	53
More fragmented /niche markets	52
Retail and processing companies increasing in size and market power	48
Bundling of inputs packages – specific combination of seed and chemicals marketed to farmers	45
Increase in regional agribusiness networks	38
Increase in small companies	38
Input suppliers increasing in size and market power	37
Spot markets	28
Virtual networks of companies	28
Less trust/More opportunism in markets	20
Increase in co-operatives	9

Source: Own survey

South African agribusinesses agreed with their international counterparts on fragmentation / niche markets, the reduction of small companies, electronic markets and, significantly, trust and opportunism. Electronic markets can be seen as a spot market, but linked to international markets which gives the market a global dimension. In the previous section (5.6.3) it was shown that South African Agribusinesses focussing on new markets for their products which could be linked to their outlook on the fragmentation of markets and emergence of niche markets. Local agribusiness leaders agree that the opportunism will decrease and trust will increase in the business environment. Rademakers and McKnight (1998) found that an increase in trust and decrease in opportunism is a precursor to supply chain formation in an

industry. This indicates a new approach to doing business and especially coordinating with other actors in supply chains beyond the current spot market approach.

Table 5.9: The Shape of the Agrofood Sector

Item	NL	EU	World	RSA
Larger scope in companies	0.73	0.75	0.70	0.54
Vertically integrated supply chains	0.85	0.91	0.90	0.72
Spot markets	0.23	0.19	0.20	0.28
Networks of companies	0.92	0.88	0.95	0.63
Virtual networks of companies	0.58	0.72	0.70	0.28
More fragmented / niche markets	0.77	0.56	0.60	0.52
Increase in small companies	0.15	0.44	0.45	0.38
Increase in global companies	0.73	0.84	0.80	0.59
Electronic markets	0.81	0.78	0.80	0.73
Less trust / more opportunism	0.27	0.28	0.20	0.20

Source: Zuurbier (1999 b) and own survey

However, the two aspects where the agribusiness managers differ from each other on networks and the impact of company scope and global companies. This indicates the limited scope for company growth in domestic markets. The lower importance of networks indicate, in contrast to the improvement in trust and reduction in opportunism, that South African agribusiness still lags behind international business practises. In the same line of argument South African companies attach less value to the emergence of vertically integrated supply chains, more managers think that the spot market will still play a role and networks of companies are scored significantly lower than their international counterparts.

Given the improvement in trust, but lower values for networks and supply chains, an increase in the importance in supply chains and networks can be expected. Companies will still become larger through mergers and acquisitions and the distance between the producer and consumer will be reduced. This indicates that companies with larger scope operating in more coordinated supply will emerge over time.

The drivers of the changes in the agrofood sector is discussed in the next section to elucidate the differences between the two sectors.

5.6.5 Major Factors Driving the Agrofood Sector

The results of the survey conducted by Zuurbier (1999 b) are presented in Table 5.10 and the results of the expanded South African survey are presented in Table 5.11. The most important factors driving the international agrofood sector are consumer behaviour and technology. This is also evident in South Africa where changing consumer needs and information and communication technology are regarded as the second and third most important factors (company competence was not included in the international survey and these factors would therefore have been the most important). Biotechnology is rated lower by South African managers than information and communication technology. This, in combination with the consumer drive, indicates the strategic direction for the future. Companies will improve their knowledge and communication with consumers by means of better communication technology. This also implies a higher level of information sharing and communication between companies. These are intermediate steps towards supply chain formation as indicated in Chapter 4. In contrast, supply chains are not seen as a big driving force in the agrofood sector on local and international level. However, it is clear from the results that supply chains would probably increase in importance in the agrofood sector of the future.

Company competence is regarded as more important by South Africa agribusiness managers. This is congruent with the importance to cost, local markets and the optimisation of profitability and risk profiles. South African agribusiness firms seem to be on an inward focus to improve their competencies to operate on international markets.

There is a big difference in the perception with regards to multinational companies between the international and South African firms. International managers regard multinational food companies as the third most important driver, while South Africa managers regard the impact of these companies as minimal. This also explains the why managers do not see multinational companies as a big force on local markets.

Table 5.10: Major factors driving the international agrofood sector

Factor	NL	EU	World	Total
Multinational food companies	3,7	3,8	3,7	3,7
Supply chains	3,0	3,2	3,7	3,3
Regions	2,6	2,5	2,7	2,6
Local supply networks	2,9	3,3	3,2	3,1
Technology	3,9	4,0	4,1	4,0
Collusion/mergers	3,8	3,3	3,5	3,5
Consumer behaviour	4,0	3,8	4,4	4,0
Increased competencies	3,4	3,7	3,6	3,6

Source: Zuurbier (1999 b)

South African Agribusiness clearly do not see international or global agribusiness firms as an important threat in domestic markets. They clearly want to enter new markets with their existing products. They intend to do this through improved knowledge of the consumer through better communication and coordination with other firms in the supply chain. The second important focus area is the competencies and the ability of their enterprises to compete effectively on the new markets, especially international markets. Non-core activities will be outsourced to enable companies to devote more attention to core activities. Improved quality will be the most important driver for supply chain formation as indicated in chapter 4.

Table 5.11: Major factors driving the South African agrofood sector

Factor	Score*
Company competency as a competitive edge	3.5
Knowledge of changing consumer needs i.e. consumer behaviour	3.4
Impact of Information and Communication Technology	3.3
South African capability to perform on international markets	3.2
Globalisation – new market opportunities and new competitors	3.2
Cooperation to ensure quality in the supply chain	3.2
Focus on core activities and outsource non-core activities	3.1
Importance of GAP (Good Agricultural Practise); HACCP and other certification systems	3.0
Cooperation in supply chains to serve new consumer demands	3.0
Cooperation to preserve unique product characteristics (e.g. non-GMO certified)	3.0
Cooperation to improve the consistency of the products in supply chains	3.0
Environmental legislation and liability in the international market	2.9
Impact of Biotechnology	2.9
Impact of local supply networks	2.8
Ability of South African firms to serve niche markets	2.8
Impact of deregulation	2.8
Interdependence of firms in the supply chain	2.7
Multinational food companies selling their products in South Africa	2.7
Land redistribution	2.6
Multinational food companies buying their products in South Africa	2.5
Environmental legislation and liability in the South African market	2.4
Economic empowerment of previously disadvantaged	2.4
Importance of commodities as opposed to differentiated products	2.3
Regional trade liberalisation (Southern and Eastern African Trade Blocks)	2.1

* Likert scale 1 (not important) – 5 (very important)

Source: Own survey

5.7 Conclusions

In the first section of this chapter the different drivers for change in the agrifood sector were discussed. The most important drivers are changes in demand for agricultural products, changes in agricultural policy and changes in the agricultural supply structure. The changes in the agricultural supply structure is extensively discussed in chapter three. New consumer demands like an increased awareness for

food safety, a need for variety and entertainment is increasingly met with aggressive retailers employing new technologies leading the way. These trends form the basis of section one of the framework of analysis presented in Figure 1.1. These trends determine the product attributes and activities required to produce these attributes in section two of the framework. The importance of these trends in the South Africa agribusiness sector are quantified in the last section of this chapter.

The South African agricultural marketing environment was substantially influenced by deregulation of the sector followed by the promulgation of the Marketing Act of 1996. The deregulation exposed farmers and agribusiness alike to international markets and opportunities.

The final section of the chapter showed how South Africa agribusinesses are responding to the challenges posed by the deregulation of the agricultural sector. Agribusinesses are clearly preparing themselves to be more competitive on international markets. It is clear that there is a significant move away from market based coordination mechanisms to managed coordination in the South African agribusiness sector. This provides some basis for the generalisation of the results in the case studies that follow. In the first section of the framework of analysis consumer demand, technology, deregulation and supply structure are identified as significant drivers of the emergence of supply chain management. It is clear that consumer behaviour and technology are important drivers in the South African agrofood sector. The impact of deregulation is not seen as a significant driver for the future, probably because the deregulation process is completed and no new impacts are expected. Supply structure is seen as an important driver in the agrofood sector, especially in terms of better coordination and cooperation to ensure and assure product quality. These drivers give rise to the growth of the supply chain philosophy in South Africa, but at a slower pace than their international counterparts.

The next three chapters deal with the observations of these trends in specific case studies in the South African agribusiness sector.

Chapter 6: Case study: Considerations for managing the Sandveld Potato Supply Chain

Chapter 6: Case study: Considerations for managing the Sandveld Potato Supply Chain

The Sandveld Potato case focuses on the spot market governance structure as indicated in Figure 6.1. This case serves to illuminate three insights. The first is that the production and marketing of undifferentiated, homogeneous commodities are characterised by low asset specificity, low task programmability and low task nonseparability. The framework of analysis indicates that a spot market is the most efficient governance structure for the marketing of a commodity. The Sandveld producers are currently using a commodity approach in the production and marketing of their potatoes.

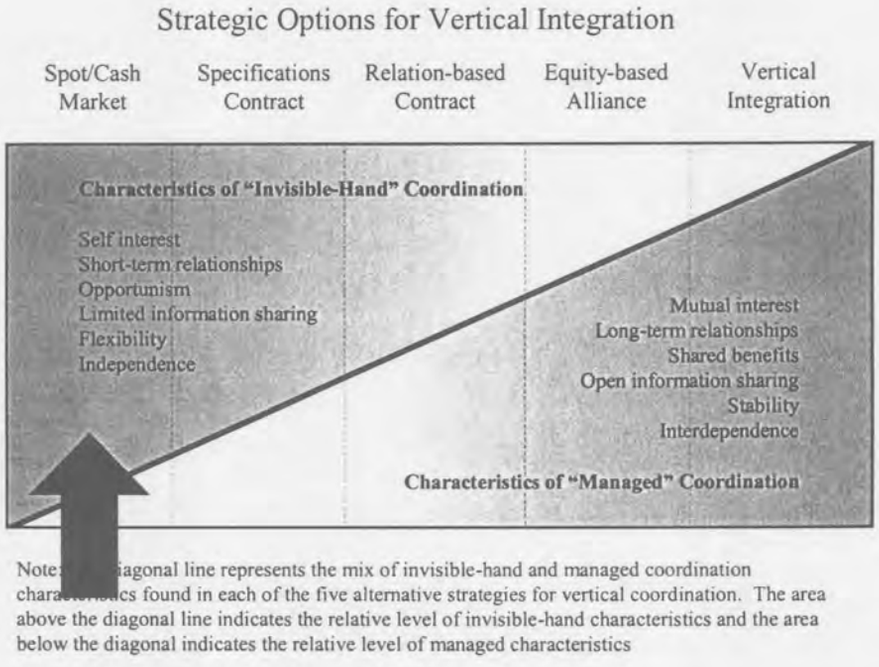
The second insight indicates that the Sandveld potato producers will have to identify and add value to their product to escape from the commodity market. This value will increase mutual interdependency among certain actors in the market, which is the basis of chain formation. If they cannot create such value, a market structure with closer relationships between the participants will remain the optimal governance structure. The value creation must be based on meeting consumer needs.

The third insight is into the factors which inhibit supply chain formation namely adversarial relationships, farmer isolation, volatile prices, and size imbalances between the participants. These factors explain why it is difficult for farmers to escape from commodity markets.

6.1 Introduction

Many South African agribusinesses are buying into the concept of supply chain management. However, implementing and designing supply chains is neither apparent nor easy. In view of the legacy of a highly regulated agricultural economy farm producers are by nature not particularly aligned nor interested in consumer preferences or added value management. Members of the Sandveld Potato Grower Organisation (SPGO) however considered value added as an option to improve the profitability and sustainability of their operations. This case study is an account of the

realities, challenges and barriers that the actors in this supply chain encountered when they investigated the possibility of implementing a supply chain initiative.



Note: The diagonal line represents the mix of invisible-hand and managed coordination characteristics found in each of the five alternative strategies for vertical coordination. The area above the diagonal line indicates the relative level of invisible-hand characteristics and the area below the diagonal indicates the relative level of managed characteristics

Figure 6.1: The position of the Sandveld potato governance structure on the vertical coordination continuum

Source: Peterson, Wysocki and Harsh, 2001

6.2 *The potato industry in the Sandveld*

Potatoes are the main farm crop enterprise for growers in the Sandveld region of the Western Cape Province in South Africa. More than 7 100 hectares of potatoes are cultivated annually in South Africa and the Sandveld potato production account for around 13% of the total production in South Africa (Table 6.1).

The Sandveld region is an arid plain with an annual rainfall of less than 300mm. In the west the plain borders the Atlantic Ocean and in the east the picturesque Sederberg Mountain range. The growers are therefore limited to potato production under irrigation (mostly centre pivot units) and extensive, low profit, livestock production. The average size of a centre pivot unit is 25 hectares. Because of a four-year fallow system to prevent the soil transfer of diseases, natural vegetation had to make way for potato production. Mostly there are four centre pivot units of fallow

land to every unit in production. Ground water through boreholes supply the centre pivot units with water from underground. The main source of underground water is a geological aquifer system that relays rainfall water from the mountain region in the east.

Table 6.1: The production of potatoes in the Sandveld region in comparison to the total production of potatoes in South Africa.

Item	Unit	1999 crop estimate	2000 crop estimate
Sandveld region	Ha	7 163	7 144
	Ton	234 818	210 358
South Africa	Ha	56 680	53 193
	Ton	1 743 839	1 589 042

Source: Crop Estimate and Report (2001)

The mean maximum summer temperatures vary - cooler along the coast and very hot in the inland areas. Due to the heat during December and January the production of potatoes has to be interrupted. Conversely, the mean minimum temperatures are warmer (mild) along the coast but very cold in the inland areas as indicated in Figure 6.2.

The region is characterized by very sandy soils with low water retention properties. The pH of the soil is below 5.5, which indicates high acidity. The organic matter content is very low (<0.3%) and the soil shows an increased sub-soil bulk density. The soil properties imply that 90% of the roots develop in the top 40cm of soil. Because of low water retention the Plant Access Water (PAW) is less than 20 mm and a high irrigation frequency is therefore needed. The soil has no buffer capacity with high associated risks of moisture stress and erosion. A high leaching potential and low nitrification are the main characteristics of the soil. Agricultural practices were adapted and developed around soil and climatic characteristics.

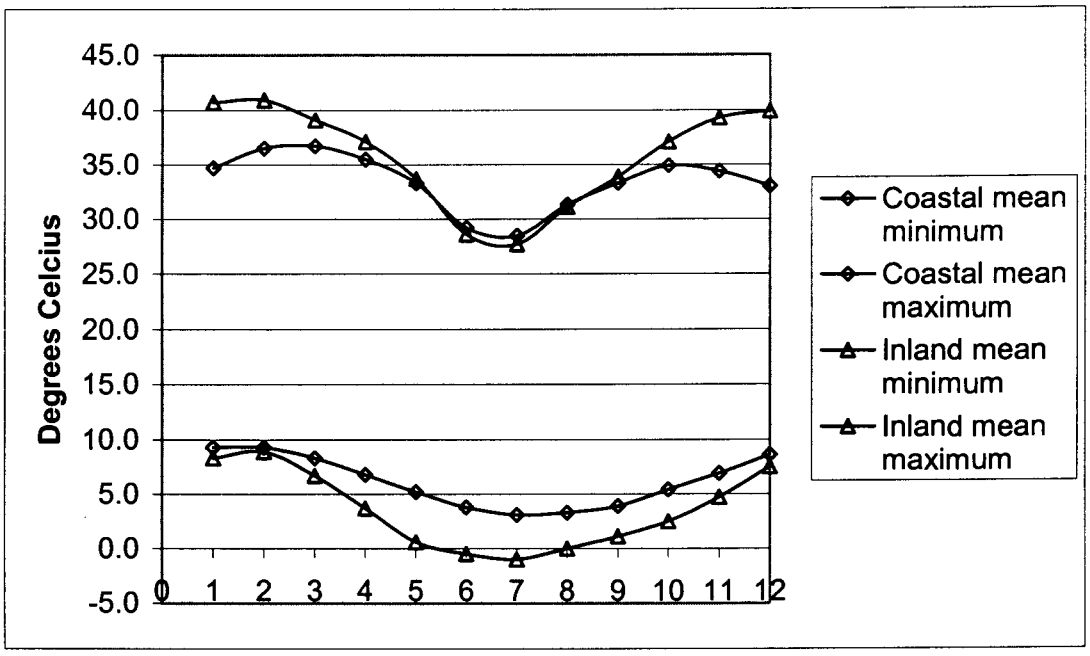


Figure 6.2: Average mean maximum and minimum temperatures for the coastal and inland region

Source: Agromet, 2002

6.3 Marketing Channels

The Sandveld potato supply chain system is depicted in Figure 6.3. The growers in the region produce ware and seed potatoes. Ware potato growers favour disease-free seed potatoes, making the Sandveld region an ideal seed potato production area due to its isolation from other potato production areas in South Africa and their potential diseases. The total South African production of certified seed potatoes was 131 604 tons in 1999. The Sandveld region contributed 58 401.83 tons or 44% to this total in that year. The contribution dropped to 34% in 2000 mainly due to leafminer infestation, illustrating the sensitive nature of seed potato production. (Crop Estimate and Report, 2001).

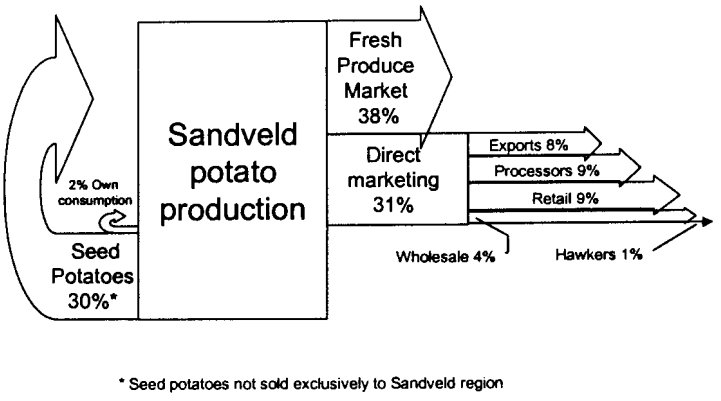


Figure 6.3: The Sandveld Potato Supply Chain (2000)

Source: Own figure, data from SPGO, 2000

Seed potato production account for only 30% of the total crop, as potatoes of a lower quality is usually sold as ware potatoes. Two percent of the crop is used for own consumption and the rest is marketed 'directly' or through the fresh produce market in Epping, Cape Town. According to an unpublished report (SPGO, 2000) 38% of the Sandveld ware potato crop was sold by market agents through the fresh produce market and 31% were sold by growers 'directly' to retailers, processors, wholesalers and hawkers. In the case of 'indirect' marketing growers deliver their potatoes to an agent at the fresh produce market. The agents facilitate the auction sale of the potatoes through private negotiation between themselves and a third party which can be a retailer, hawker, processor or exporter. The agents charge a commission of 5% and the grower has to pay another 5% to the marketing authorities of the Epping Fresh Produce Market. A National Potato Grower Association levy of 10 cent per 10kg pocket is deducted.

'Direct' sales (31%) generally entail the exchange of potatoes without the mediation of a market agent. Buyers approach the grower and an informal, medium- to long-term contract is usually concluded (with the exception of hawkers who buys sporadically from growers in the spot market). The growers sell 8% of the direct sales

to exporters. These potatoes are usually sold to multinational companies with industrial interests up the African coast, or holiday resorts on islands. Another 9% is sold to processors that process the potatoes into chips, crisps and peeled potatoes (mostly frozen). Four percent of the potatoes are sold to wholesalers who sort and pack it for retailers. Retailers and hawkers account for respectively 9% and 1% of sales. A hawker is defined as any informal business that does not have a brick and mortar establishment. Hawkers usually group together in order to buy product in larger volumes from the grower at lower prices.

The informal contracts which growers and buyers engage in range from a time, place and quantity commitment to special packaging requirements and price agreements by retailers. The contract prices are usually based on the fresh produce market price of Epping close to Cape Town e.g. the price of 1st grade potatoes on the day of delivery or the market price added a premium of 10% if prices are down or at a discount of 10% if market prices are higher. The best potatoes are mostly sold via the direct route as the buyers endeavour to secure the best potatoes in the market. Sandveld potatoes are of a high quality. Just more than 50% of the potatoes that are sold 'directly', in the Western Cape Province originate from the Sandveld region (See Table 6.2).

Table 6.2: Percentages of Sandveld Potatoes Sold Directly in the Western Cape in Comparison to the Total Direct Sales in the Region.

	Demand Western Cape (ton)	Supply Sandveld (ton)	Percentage (Sandveld)
Processors	83 760	29 830	35,6
Retailers	19 320	13 524	70,0
Traders and exporters	51 330	33 365	65,0
Hawkers	6 000	6 000	100,0
Total	160 410	82 719	51,6

Source: SPGO (2001:42)

Table 6.3: Potatoes quantities (all classes) produced and average price received on the Fresh Produce Market of Cape Town; 1996 – 2000.

Year	10 Kg	Rand per 10 Kg
1996	13 253 905	8.62
1997	13 123 160	9.13
1998	12 923 777	10.53
1999	12 766 538	9.83
2000	12 010 226	12.65

Source: SPGO (2001:36)

Anecdotal evidence indicates that the 'direct' marketing of potatoes is on the increase. More growers opt to move away from the discrete transactions in auctions to the longer-term relational exchanges that 'direct' marketing offers. In Table 6.3 it is clear that the total quantity offered on the fresh produce market has been on the decline since 1996, while the area under production has increased according to anecdotal evidence.

6.4 *Drivers of change*

The Sandveld Potato Growers Organisation became aware of the concept of supply chain management when representatives from the Department of Agriculture suggested it as an option to improve the situation of the growers. They called a general meeting involving all the actors involved in the potato marketing system with the help of the authors. The goal of the meeting was to identify and discuss the perspectives of the different actors. The analytical frame of reference used was derived from O'Keeffe, 1998. He identifies four features which inhibits effective co-ordination between supply chain actors:

- In commodity markets the sum of value created is fixed and the major issue is how it is divided among channel participants. This is a win-lose game and leads to **adversarial relationships**.
- Auction systems and regulated markets **isolate farmers** from the rest of the food system and farmers do not gain any insight into their customers, and why they act the way they do. Likewise processors have not needed to, or had the opportunity to, develop relationships with growers.

- Supply Chain Management does not remove the **volatile nature of prices and supply** – both quantity and quality – characteristic of agriculture. Price volatility puts pressure on the relationship.
- Interdependence is difficult to achieve owing to **size imbalance** between processors and farmers.

All of these features were observed in the initial meetings with the potato producers. The **adversarial relationships** that existed between the participants was particularly evident, taking the following statements as examples:

"Ever since man started raising crops – producing wealth – others have attempted to take that wealth away from him by taking his crops and giving him very little in return." – statement by growers in invitation.

"We have lost control of our product. Everybody connected to the potato industry has the right to a profit margin, only we, the growers are expected to sell at prices below cost."

"Growers have a lot of time to discuss their problems with you."

"A grower will renege on a contract at the drop of a hat – they can't be trusted and it is not worth the time to take them to court."

The participants see the potato market as a commodity market with limited opportunities for product differentiation and price making. The primary reason is that the South African population is relatively poor and therefore price sensitive. The wealthier markets where opportunities for product differentiation exist are limited and the participants are therefore stuck in the battle for a share in the final value.

The adversarial relationships in the potato market also leads to excessive opportunistic behaviour, especially by the growers. The processors, exporters and retail buyers were especially unhappy with this situation indicating that growers renege on contracts when they observe the notion of a better price elsewhere. This

increases transactions costs associated with price- and delivery risks. Growers on the other hand maintain that they are under severe price pressure and that it makes sense to exploit every possibility to achieve a higher price. Growers and the rest of the players in the supply chain are therefore clearly operating in an adversarial and opportunistic system.

Auction and regulated markets tend to **isolate growers** from the rest of the supply chain. This was one of the most evident observations as the actors in the supply chain have never had a meeting of such a nature before. During the meeting it was observable how the participants developed an appreciation of each other's perspectives and positions. It became clear that growers are isolated from the needs of the market. Buyers indicated that growers are not supplying the correct cultivars and quality to the right markets. Growers indicated that they do not have enough information on prices, cultivars and quantities on the markets. They blamed the market agents for not supplying them with reliable marketing information and they therefore do not trust the price formation process either. The lack of information and co-ordination in the market causes growers to act in an unorganised way without an effective marketing and production strategy. Buyers indicated that it is important that growers should choose a specific market, be it seed, processing, ware or export, and focus on addressing the specific needs of the chosen market. The lack of information due to the isolation of the growers by the marketing system prevents growers from implementing effective marketing strategies i.e. identifying and serving specific market segments with specific products.

The **volatility of prices and supply** is and will remain a major stumbling block to a successful supply chain approach. The potato supply from the Sandveld region is relatively stable as most of the potatoes are produced under irrigation. The problem, however, emanates from the price volatility and -formation on the fresh produce market. Price volatility is induced by the influence of weather conditions on the supply from other production areas. The issue of price formation between the participants in the supply chain is a contentious issue. It is clear that there is a substantial trend away from the fresh produce markets (spot markets) due to the use of contracts especially between retailers, processors and the growers (Figure 6.4). The best quality ware potatoes are channelled to the retailers because of their high quality

standards, specifications and relatively higher prices. The consequence is that the price on the Epping Fresh Produce Market (which is the reference price for all the other channels) is based on the 2nd and low-end 1st grade ware potatoes delivered at the market. Therefore, because contract prices are usually linked to market prices on the Epping Fresh Produce Market, the low-grade potatoes sent to the spot market determine the price of potatoes in the ware potato market in the Western Cape Province. Potato growers argue that the prices for high quality produce are depressed in this way and thus they do not trust the price formation process.

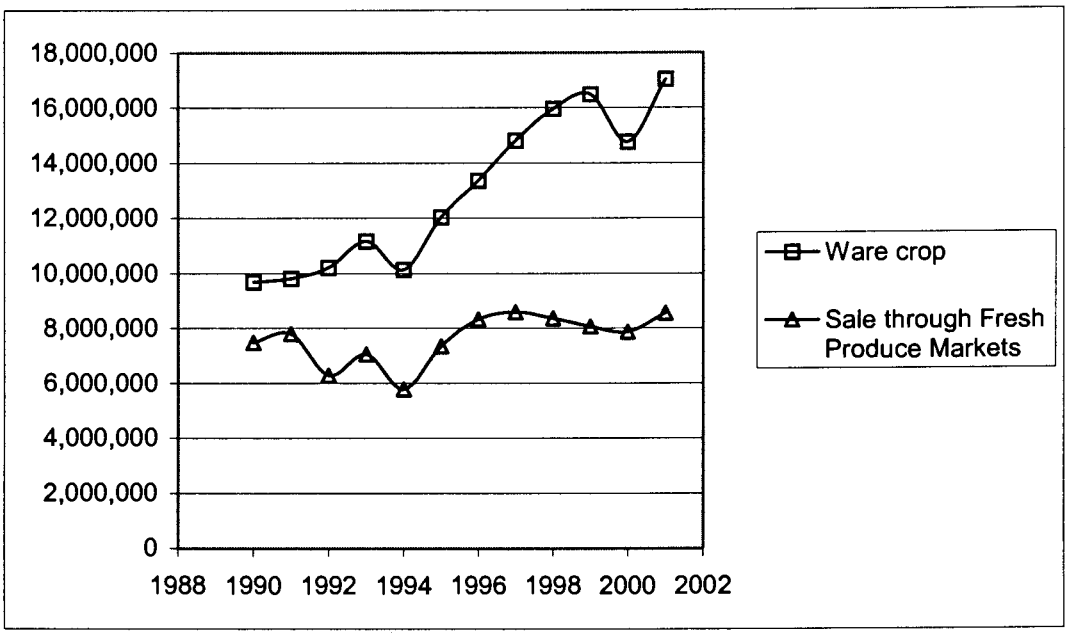


Figure 6.4: Ware production and delivery to the Fresh Produce Market from the Sandveld Region

Source: Potatoes South Africa, 2002

The **size imbalance** between the numerous 'smaller' farmers and 'large' buyers in the market is described by the participants in the chain as fragmentation on the production side. Fragmentation seems to have a double meaning, in that there is a perception of over-production in the market leading to intense competition, and a fragmentation of marketing strategies. This fragmentation is seen in contrast to the 'big buyers' who circumvent the auction market to contract their produce through individual negotiation.

Due to low wheat prices in previous years and the discovery of sustaining underground water resources many monoculture wheat growers in the southern part of the Sandveld region diversified into potato production. This trend pressurised supply on the potato market. An additional reason for the expansion of potato production is that new entrants can produce at reduced production cost over the short term as new fields that are not contaminated by potato pests and diseases yet the overheads for the new entrants are also relatively low as they still have existing enterprises aimed at the production of wheat. These new growers are therefore able to spread their overheads over a broader set of farming activities.

There is no effort of co-operation between the potato growers to market their produce collectively. Seed and ware potato growers in the Sandveld region still act in an individualistic and fragmented way and therefore find it difficult to market their potato as in sufficient quantities to establish a differentiated product of origin in the market. The growers however indicate that it is important to differentiate on a scale large enough to make an appreciable impact on the market through quality and consistency. In order to achieve this objective they will have to engage in a co-ordination system for both production and marketing i.e. a supply chain management system.

6.5 Analysing the situation

The three main barriers to supply chain formation are communication, opportunism and fragmentation. Communication between the participants is critical to identify opportunities for co-operation. Growers are isolated from the need of the consumer and the market. Without proper communication and knowledge the growers will not be able to innovate to establish grounds for effective co-operation with other chain participants. Opportunism is detrimental to supply chain formation as the participants cannot invest in long-term relationships. In an opportunistic environment participants are hesitant to invest in each other as this investment is lost when one of the parties act opportunistically. These long-term relationships are necessary for innovation to improve efficiency, exploit new markets and differentiate products. Opportunism is also closely linked to the fragmentation of the markets. Growers need to co-operate with each other and other participants in the supply chain to facilitate innovation.

Innovation is necessary to establish a competitive advantage for the Sandveld potato supply chain.

Table 6.4: The Sandveld Potato Growers Compiled the Following SWOT Analysis

• **Strengths** • Excellent quality • Consumers already prefer the Sandveld product • Potatoes can be produced throughout the year, which means that continuity is assured • Seed production areas – the best seed production areas in the rest of the world are also situated on the West Coast of continents	• **Opportunities** • To bring back production and marketing discipline to the industry • To expand the potato seed industry • Sufficient uncultivated land • Export possibilities – opportunity to obtain a certificate of "product of origin"
• **Weaknesses** • Over-production – growers were not all in agreement as to whether there is indeed over-production • Too few cultivars • Poor infrastructure • Long distances from market(s) • Marketing – growers lose control over their product and bear all the risks • High production costs as a result of poor soil • Limited co-operation and trust among growers (growers are fragmented)	• **Threats** • Losing market share – the Fresh Produce Market could lose its position as price making mechanism. The price on the market must be seen merely as a "price index" • Impact of AIDS on potato consumption • Resources – deterioration of water resources and indigenous vegetation • Fragmented growers ("the divider rules") • Cash sales from production unit level – buyers use Fresh Produce Market price as reference and negotiate lower prices by insisting on discount for transport, commission to agents and statutory fees regarding the Fresh Produce Market • Market agents do not negotiate for the highest price but aim merely for a high turnover

From this it is clear that potential to deliver a unique and differentiated product to the market is great for "Sandveld potatoes". Grower co-operation and trust relationships with other functions in the supply chain need to be cultivated.

6.6 Alternative governance structures for the Sandveld Potato Chain

The participants identified different collaboration strategies to address the problems facing the potato supply chain. These strategies are partial horizontal coordination, total horizontal coordination, and vertical coordination between some growers, processors and retailers. Each of the strategies implies different levels of governance and coordination between growers, processors and retailers.

- *Grower co-operation: Partial horizontal coordination between some growers*

The first strategy would involve coordinated cooperation between growers in the Sandveld region to promote a new characteristic or image of their products in order to achieve better negotiation power *vis-à-vis* downstream firms. Growers proposed to use specific attributes that are desirable in the market to gain a competitive advantage, for instance:

- The setting up of a potato brand with more specifications (quality and traceability guarantees, short time to the market…etc.);
- The concentration of commercial function in setting up a selling board, which could sell bigger quantities and ensure flow continuity to the processors or the retailers.

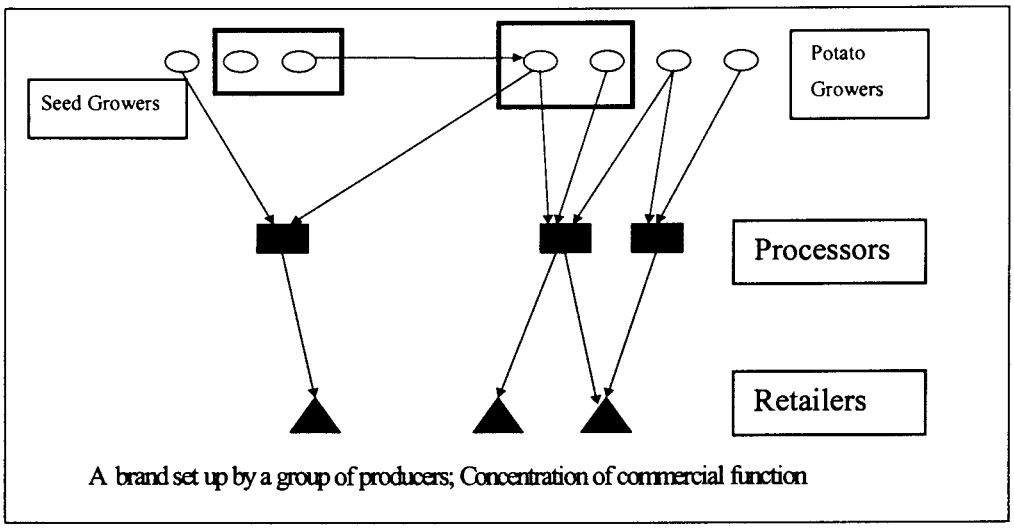


Figure 6.5: Partial Horizontal Coordination between Growers

- Grower cooperation – Full *horizontal coordination between growers*

Grower cooperation through full horizontal coordination implies that all (or most) the ware and seed potato growers in the Sandveld region coordinate to promote regional product identity, for example. This strategy could potentially allow the coordinating growers to control the supply to downstream firms and increase the negotiation power if the product is well differentiated from other regions.

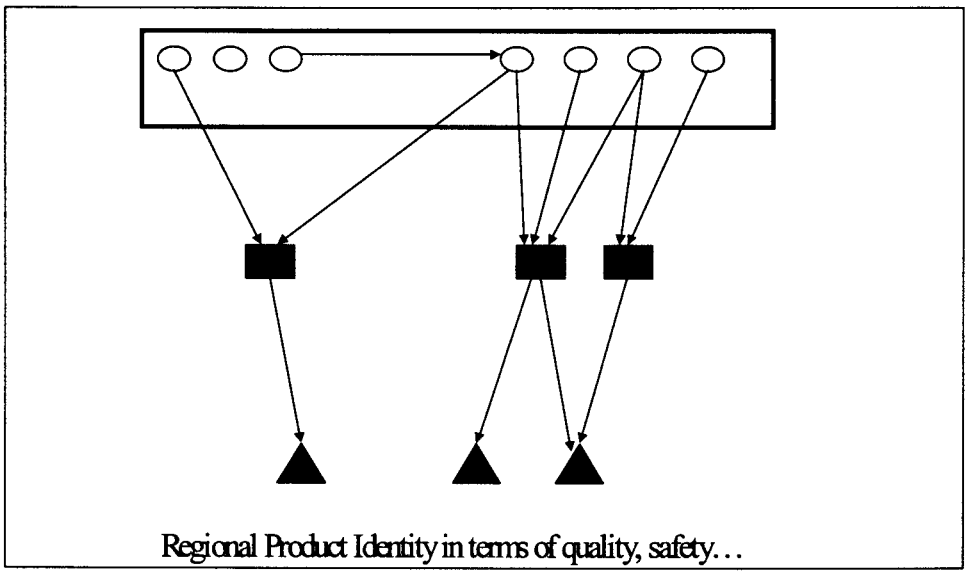


Figure 6.6: Total Horizontal Coordination between Growers

- Vertical coordination between growers-processors-retailers

Vertical coordination between growers, processors and retailers could set up tighter relationships between some growers, some processors and/or some retailers, based on specifications determined by downstream firms according to the targeted markets. Information sharing, logistic and transportation constraints, type of products, ordering policies and supply flexibility could be included in vertical contracts in order to create value at the chain level (by cost decreasing and/or by increasing the willingness-to-pay of the final consumer). Benefits could consequently be shared among the different stakeholders involved in the strategy.

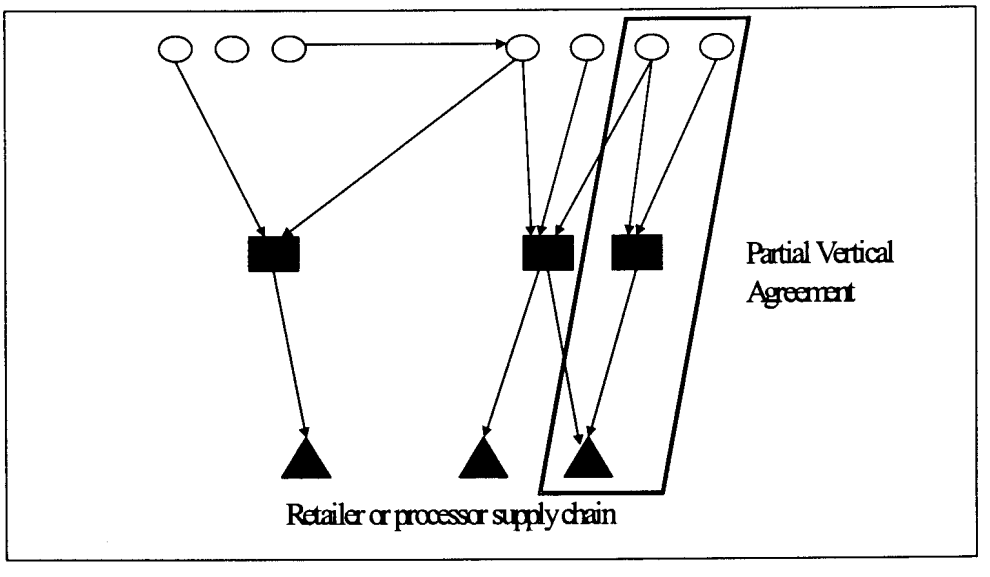


Figure 6.7: Vertical Coordination between Growers-Processors-Retailers

The choice of the strategy that the stakeholders have to follow depends on:

- the capacity of the growers to set up a better co-ordination between themselves;
- the possibility to promote new brands or a regional identity towards the final consumer, and of course the consumers' willingness to pay for this identity;
- the ability to create value through new practices at the production level or through a better mastering of the flows from upstream to downstream;
- the possibility to set up "good" contracts in order to give the right incentives among the different stakeholders and avoid opportunistic behaviours.

6.7 Observations and conclusions: Challenges to chain formation

From the analysis it is clear that the Sandveld Potato chain is still operating in the realm of low coordination and consequently low levels of innovation and trust. The relationships between the actors are opportunistic and short term in nature and characterised by self-interest, and limited information sharing. The different actors maintain their flexibility and independence. A supply chain management approach could improve the competitiveness of their industry by streamlining business activities. The potato supply chain is currently characterised by higher inventories to avoid out-of-stock costs for all the actors, as they do not trust the supply chain to deliver the right quality and quantity product at the right time. Order lead times are high and orders are variable which leads to price variability. There is also considerable distrust in the price formation mechanism. Growers feel that market agents are not giving them enough information on market conditions and are charging too much for their services. Market agents and growers observe that the best potatoes are contracted out to retail groups, exporters and processors. The price formation in the potato market of the Western Cape is therefore done on lower grade potatoes. The exporters, processors and retailers use the market price as reference prices for their contracts and negotiations with the growers which results in a lower price for all the actors in the industry. The level of innovation in the supply chain is much lower, and related to this, the reactivity of the chain to new changes and initiatives. The actors do not support each other or engage in joint development of initiatives to gain a competitive edge in the market because they are not assured that the innovation will be used to their advantage – i.e. actors expect each other to break the innovating relationship to benefit themselves in the market with the results of their partnership, in effect making the partnerships' innovations public knowledge. The service level in the supply chain is also low and the chain is not able to fulfil modern consumer demands like food safety, product of origin and organic production.

Differentiation and consumer preference: Growers are always faced with strategic options namely specialisation or diversification. Growers that opt for the specialisation option are essentially cost and production focussed to excel in the market by delivering product at the lowest price. Specialised growers usually deliver

a standard product at a standard market. These growers will not benefit greatly from a supply chain management approach except for price risk reduction. Growers that attempt to differentiate themselves from other growers by producing a superior product or a product with unique characteristics will benefit greatly from a supply chain management approach. The growers will have to adopt a more consumer-orientated approach. Innovation is one of the most important key performance areas to stay ahead in the supply chain game. Retailers are not really compelled to innovate to reduce transactions costs, as they are involved with the management of their stores and are historically inclined to opportunistic relationships with growers. Growers in organised supply chains that can offer the retailer or exporter better value will be assured of a market. Product differentiation lies at the basis of such innovation strategy and growers will have to find ways to differentiate their products, be it superior service, handling, coordination, product or consumer communication.

Grading and quality control: Most of the participants agreed that the quality (grading) system is adequate and that the implementation thereof is sufficient. The range of the quality system could possibly pose a problem. However, some of the participants indicated that they are not always assured of the quality in the bags. A quality guarantee scheme could be a first supply chain initiative if there is sufficient need for it in the market.

Information and intelligence: Growers will need more information from the market in terms of consumer needs and price formation. It is important that the emphasis should not necessarily be on more information gathering, but rather information sharing and intelligence creation. Innovation activities depend on information about the needs of consumers and buyers alike.

Data, information and more importantly strategic intelligence lie at the heart of the supply chain management approach. The world economy is in the information era and agri-enterprises will have to adjust to these conditions. Knowledge is still power and intelligence is the platform for innovating products and services that will give enterprises the competitive edge in the market. Four important areas were earmarked for intelligence creation to facilitate strategic direction in the industry namely market analysis, product specification, operation of the fresh produce markets and logistics.

Market analysis should provide information on the size and growth of the retail, processing, export and hawker market segments. Consumer trends and consumer reaction to price and income changes (elasticities) are key performance areas in this regard.

Governance systems: Successful supply chain initiatives in which potato growers play a significant role will depend on the ability of growers to organise in proactive groups which will address market value. Growers are responsible for the innovation – the business idea – around which the initiative should be organised. Marketing seems to be the most important challenge for grower organisation. Marketing initiatives, organised by the growers, should focus on business ideas instead of market manipulation which invariably fail in the long run. Therefore a value added service will be much more valuable than a cultivation restriction. The participants identified several initiatives that could be implemented, amongst others, regional branding, integrity and quality assurance, value creation in the supply chain to increase profitability, improved logistics and better customer service, centres of excellence and better economics of scale i.e. joint investment in expensive assets to achieve better economics of scale.

Market agents and growers alike will have to recognise the interdependence between the actors in the supply chain. This is not necessarily a disadvantage as cooperation that arises from this realisation can create a stronger supply chain. Market agents will have to augment their service to include growers and down stream buyers alike to justify their costs.

Auction markets: The participants also indicated that there is a need for markets to modernise their operation in order to enable all the users to compete with the modern facilities that some of the retail groups are erecting. The bureaucracy involved with government control of the markets causes slow decision-making and a non-dynamic business approach. Markets should improve their ability to deliver an efficient logistics service and sufficient facilities to house business activities.

Closely linked to consumer trends are the specifications required by these consumers. This is one of the most important areas for intelligence creation as this will give an indication where innovation efforts should be focussed. Consumer value and satisfaction will always remain the basis for continued market success and profitability and growers should play a leading role in providing products and services to their buyers that will, in turn, enable their buyers to achieve success in the market. Important aspects in this regard are product specification by consumers, services required by consumers from growers, logistical requirements, and the joint planning of production and marketing efforts.

Processor dominance and leadership: Processors are in the unique position to establish very efficient supply chains because of their close linkages to consumer markets and capital investment. Good working relationships between processors and growers is critically important to profitable supply chains. Processors and exporters must actively pursue good relationships with growers who, on the other hand, have a reciprocal responsibility not to engage in opportunistic behaviour. Growers who engage in long term relationships with processors will be rewarded with sizable, long term contracts and prompt payments. A supply chain relationship is essentially a partnership between the grower and the buyer which is built on mutual respect and benefit.

Fresh Produce Markets will remain an important marketing channel and price formation mechanism to the South African potato industry. It is therefore important to understand the workings of these markets. Aspects that deserve attention are the role of agents, price cycles and elasticities in the market, co-integration across markets, the size of consignments, and price formation.

Sources of competitive advantage: Logistics, especially the costs associated with logistics in a competitive industry are one of the most important sources of competitive advantage. Actors in the market should examine all the flows in the industry to identify unnecessary activities that could possibly waste money and effort. The location and size of storage and processing facilities, transportation costs and ordering processes are important aspects involved in logistics.

The realisation, that all the actors in the supply chain are mutually interdependent and need to focus on innovation to lower costs and increase consumer satisfaction, will facilitate a supply chain management approach in the Sandveld potato chain. The first foundation of a supply chain is value creation. The participants in the Sandveld potato chain need to identify attributes that will differentiate their product from other potatoes if they want to establish a supply chain. The differentiation should be based on factors that ensure higher consumer satisfaction and are difficult to replicate. Other factors like the capabilities and linkages and understanding between the organisations will also determine the success of supply chain formation. Ideally this can lead to further discussion where the participants can devise innovative strategies to ensure the implementation, sustainability and profitability of their supply chains.

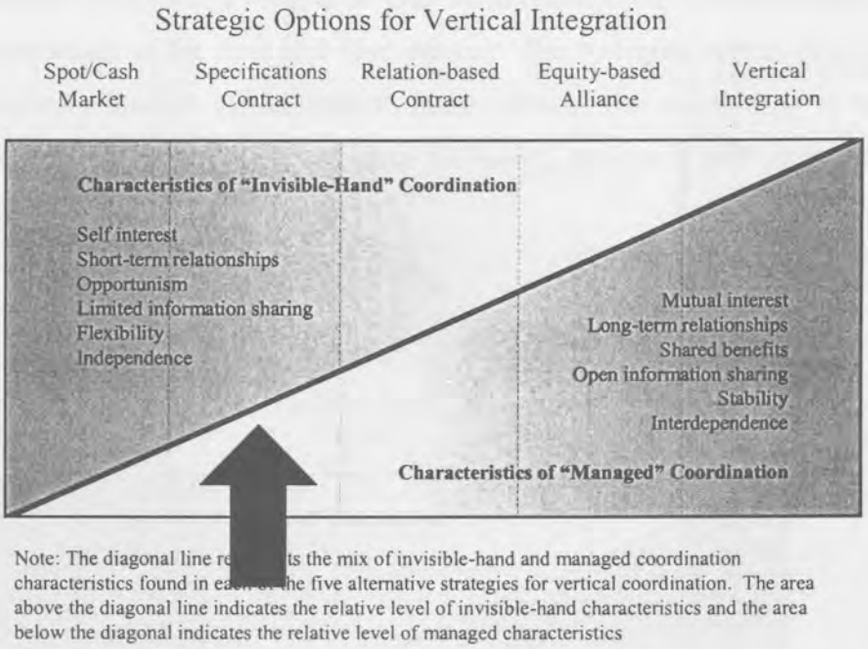
Chapter 7: Case study: Closer Vertical Coordination in the South African Vegetable Supply Chain: An Exploratory Analysis

Chapter 7: Case study: Closer Vertical Coordination in the South African Vegetable Supply Chain: An Exploratory Analysis

7.1 Introduction

This case deals with a section of the South African fresh produce farmers which are engaging in closer vertical coordination with buyers, especially retail buyers, as an alternative to traditional fresh produce markets. These participants in the supply chain are using relational contracts to govern their transactions as indicated in Figure 7.1. This chapter explores the reasons why large scale commercial producers are engaging in these relationships. The factors considered by farmers and buyers in the fresh produce supply chain can be categorised in quality, financial, risk and cost considerations. The transience of product value due to the perishability of fresh produce necessitates minimised handling of the product. The fresh produce market increases the handling of the product, leading to a reduction of product quality. Producers avoid this by contracting directly to retail buyers. Producers are of the opinion that they receive more for their products by utilising these distribution channels. Risk is reduced through assured prices and markets and joint production planning and scheduling. Price fluctuations experienced in the fresh produce markets are also avoided through contracting with downstream actors in the vegetable supply chain.

Fresh produce markets have always been promoted as a fair and efficient marketing mechanism which protects farmers and consumers alike (Langley, 1990). In 1991 the HSRC investigation into vegetable marketing found that the majority of producers wanted to continue and/or extend their involvement in direct marketing. The reasons given were security of payment, lower marketing costs, better bargaining positions for producers, less handling and better quality (Human Sciences Research Council, 1991).



Note: The diagonal line re[illegible]ts the mix of invisible-hand and managed coordination characteristics found in ea[illegible]he five alternative strategies for vertical coordination. The area above the diagonal line indicates the relative level of invisible-hand characteristics and the area below the diagonal indicates the relative level of managed characteristics

Figure 7.1: The position of the vegetable governance structure on the vertical coordination continuum

Source: Peterson, Wysocki, and Harsh (2001)An increasing number of South African vegetable farmers are engaging in closer vertical coordination with buyers through informal and formal contracts or direct marketing. This case explores the reasons why large scale commercial farmers are marketing a substantial quantity of their produce directly to retail groups. The increase in direct sales is largely the result of the unique characteristics of fresh produce and emerging consumer needs which call for closer vertical coordination among the actors in the supply chain. Traditional fresh produce markets are not able to address these specific needs effectively. The case will identify and discuss the reasons and opinions of farmers already in contractual relations and explore the transaction cost factors contributing to closer vertical coordination between producers and retailers.

7.2 An Overview of the South African Vegetable Supply Chain

The total vegetable production in South Africa amounts to about 3.6 million tons (Department of Agriculture, 2001). Farmers can sell their vegetables to several possible buyers. These are municipal markets (54%), direct sales (32%), processing

(11%) and exports (3%) (National Department of Agriculture, 2000). Industry sources contest the validity of these figures, reasons being discussed in section four (Van Deventer, 2001). Municipal markets and direct sales are the most important channels for local fresh vegetable distribution. The role of these are discussed in the next section.

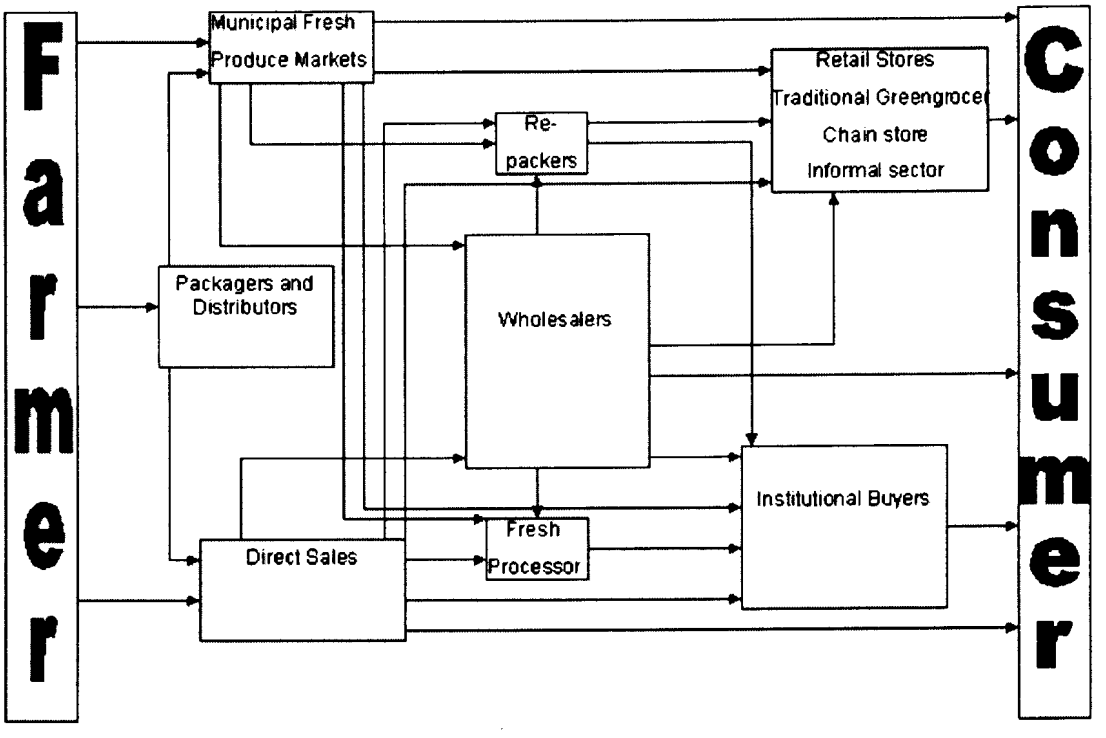


Figure 7.2: Schematic Representation of the Distribution Structure of Fresh Fruit and Vegetables in South Africa

Source: De Villiers and Van Deventer, 1990

Municipal Markets

There are 16 national fresh produce markets throughout South Africa and together these markets handle 54% of all fresh produce. The relative importance of each of the markets is shown in Table 7.1. The municipal market system came into existence in 1970 with the promulgation of the *Commission for Fresh Produce Act, Act 82 of 1970* (Human Sciences Research Council, 1991). In terms of the Act, a fresh produce market is defined as: '...a place erected or intended for the displaying for sale and the sale of fresh produce in public'.

The markets are the property of the municipalities in which they are located, with the exception of Uitenhage and Nelspruit, which are privately owned. The local authority is responsible for security, maintaining and cleaning the facilities, general managerial tasks, and traffic control. The municipal authorities fund these activities by charging a levy (percentage of sales) from the market agents (Human Sciences Research Council, 1991).

Table 7.1: Market Share of the Various Fresh Produce Markets in South Africa

Fresh Produce Market	Market Share
Johannesburg	31.7%
Pretoria	15.5%
Cape Town	13.3%
Durban	9.7%
Springs	4.9%
East London	3.7%
Pietermaritzburg	3.7%
Port Elizabeth	3.3%
Other	14.2%

Source: National Department of Agriculture, 1998.

Auctions were the customary selling procedure at the fresh produce markets in the early 20th century. The clock system was used, where large quantities of fresh produce from a great number of producers were traded quickly under conditions of strong competition. However, the system was discontinued after a short period because sellers used predetermined reserve prices to obtain higher prices, auctioneers frequently offered only large volumes in an effort to auction the produce as quickly as possible and smaller buyers gradually disappeared from the market. The volumes moving through the market became too much, which contributed to the inefficiency of the auction process. The auction and buying process ultimately took too long (Human Sciences Research Council, 1991). Langley (1990) mentions a further disadvantage, namely that it was an expensive way of price discovery because both buyers and sellers had to be present at the auctions.

The clock system was replaced by the out-of-hand system by which prices were determined through private negotiation between agents and buyers. At present, out-of-hand sales are the only means of sale at national fresh produce markets. Each market consists of several market agencies that employ market agents. These agents act on behalf of the producers. Farmers take their produce to the market agents who sell the produce at the highest possible price through private negotiation. The farmer pays the agent a negotiable commission, which is usually around 5%, on the value of the produce sold.

Direct Marketing

Direct marketing (32% of all produce) comprises direct sales of fresh produce to wholesalers, retailers, hawkers, processors, institutional buyers and consumers without the mediation of the market (National Agricultural Marketing Council, 2000).

Two main groups of wholesalers operate in the fresh produce industry namely independent wholesalers outside the markets and wholesalers situated at the national fresh produce markets. The latter hire floor space from market managements and are subject to relevant local by-laws stipulated in terms of the provincial ordinances. The most notable by-law that distinguishes independent wholesalers outside the market from wholesalers at the market is the by-law which prohibits the latter from buying produce directly from the producers – particularly when the produce concerned is available at the specific market (Human Sciences Research Council, 1991).

South Africa has four major retail store groups, which include Shoprite Checkers (which also manages the Hyperama, OK and the "8 till late" stores), Pick and Pay (encompassing Pick & Pay Hyper, Rite Value, Foodhall), Spar (Kwikspar, Superspar) and Woolworth's. Each of the retail stores manage a distribution centre that handles the procurement and shipping of fresh produce for the store (QCFresh, 2000). The retailer employ several produce buyers at each distribution centre. The produce buyers are responsible for meeting and negotiating with producers, liasing with store personnel, developing of merchandising and marketing plans, placing orders, administering price changes, and handling invoice problems. (McLaughlin, Park,

Perosio, and Green, 1999) The produce buyer negotiates an informal contract with the producer in terms of which the producer will deliver a specified product directly to the retailer's distribution centre.

A producer can deliver fresh produce to the final consumer through various different channels. National fresh produce markets and direct sales to retailers are two significant options available to producers. From the neoclassical economic perspective the market should be sufficient to guide producers in their production decisions by means of the pricing mechanism while protecting the producers from monopolistic behaviour by the retailers. The question why the direct sales arrangement exists therefore arises. This chapter attempts to explore these relationships in order to discover why they exist. In the next section a theoretical framework is proposed to explain the existence of both marketing channels.

7.3 Application of the theoretical framework to fresh produce supply chains

As discussed in Chapter 4 neoclassical economics consider transactions between firms as atomistic or independent. The exchange of product is therefore exclusively based on price, quantity and a rigid set of product classifications, standards or grades. These standards, classifications and grades constitute a robust framework in which buyers and sellers can exchange of commodities. Buyers can easily identify the product that they require and sellers can easily verify the justness of prices within the objective standards and grading framework. Producers are rewarded for producing the required composition of quantity and quality demanded in the marketplace which assures a constant supply of the product required by buyers. When consumer or buyer needs changes, standards, classifications and grades are adjusted accordingly (Milgrom and Roberts, 1992 and Hobbs, 1996).

However, the assumptions inherent in neoclassical economics restricts the ability of this powerful theoretical framework to offer insights into the behaviour of firms in the market place. Neoclassical economics assumes a perfectly competitive world where large number of competitor firms produce a homogeneous product under the same cost conditions, facing the same market demand curve. The assumption of perfect

information and homogeneous products excludes information, search and quality assurance costs. No single firm can influence power in the market and attainment of a market equilibrium is a given. In this framework of analysis it is difficult to consider the establishment of relationships among the actors in the economic system as transactions are treated as if they occur in a frictionless environment. These assumption are violated to a large extent in fresh produce markets. (Hobbs, 1996, Williamson, 1991, and Coase, 1992). As a consequence firms use closer vertical coordination as an alternative to discrete price-based transactions (Zuurbier and Trienekens, 2000).

A range of coordination modalities exist between firms. Mighell and Jones (1963:1) defined vertical coordination as "the ways of harmonizing the vertical stages of production and marketing. The market-price system, vertical integration, contracting, and cooperation singly or in combination are some of the alternative means of coordination." The exchange between two firms is therefore always controlled by some kind of mechanism – be it price as in a spot market, a whole array of stipulations in a contract between the parties or the bureaucratic controlled specifications from one division to another in a vertically integrated firm (Hobbs, 1996).

The specific modality for a transaction is determined by transaction costs involved (Williamson, 1991, Hobbs, 1996, and Peterson and Wysocki, 1997). Transaction costs arise due to information asymmetry, bounded rationality and opportunism. Transaction costs arise *ex ante* and *ex post*. *Ex ante* costs include costs such as search for- and evaluation of- suitable partners for exchange, quality and other specifications, gathering information to use in the bargaining process, determining contractual terms and agent or middleman fees. These costs are also referred to information and negotiation costs. *Ex ante* costs occur after the transaction was concluded and refer to costs that are incurred in the monitoring and enforcement of the terms agreed on in the transaction. (Hobbs, 1996, Coase, 1937 and Williamson, 1991).

Uncertainty lies at the basis of information costs. Akerlof (1970) first discussed the effect of uncertainty on the market mechanism. In the neo-classical paradigm the firm

does not care where the product comes from or what the buyer is going to do with the product. Akerlof (ironically) identified this as the essential difference between a financial market and a potato market. The repayment ability of an applicant and the application of money is very important to a financial institution, while a potato seller is not concerned what the buyer is going to do with the potatoes as the buyer is not concerned about the origin of the potatoes. The demands for food safety and quality assurance placed on the food system by modern consumers are changing this state of affairs drastically. The market for 'lemons' and the market for vegetables are displaying similar characteristics as consumers demand better quality and perceive risks included in the product that they buy. Uncertainty can be subdivided into four categories namely uncertainty over product quality, reliability of supply, price and finding a transaction partner (Hobbs and Young, 1999). Product quality is uncertain as the buyer cannot always determine product quality objectively. Insufficient cold chain maintenance will for example be expressed in reduced quality over time, but is relatively difficult to ascertain at the moment of the transaction. Reliability of supply in terms of the timeliness and quantity required by buyers is a problem faced by buyers. Retail firms need a constant supply of quality fresh produce to maintain a consistent offering to customers. This is not always possible at spot markets as buyers have reduced information on production and deliveries by farmers. Price uncertainty is faced by both sellers and buyers in the market. The volatility of prices in the market is usually a problem for producers as their income fluctuates and for retailers as they attempt to offer constant prices to consumers. Sellers may encounter problems in finding a market and buyers to find specific products on the market. Uncertainty increases the transaction costs of firms in the vegetable market.

The perishable nature of vegetables exacerbates the effects of transaction costs, information asymmetry, moral hazard and uncertainty. Perishability cannot be measured objectively which increases the uncertainty as discussed in the previous section. Products have to be moved to the market quickly and transferred to the buyer as soon as possible to avoid quality deterioration, leaving sellers unable to store the product in order to wait for favourable market conditions. (Hobbs and Young, 1999). The following characteristics of fresh produce that makes it susceptible to vertically

coordinated marketing or direct marketing (Mallen, 1967, HSRC, 1991, and Seitz, Nelson and Halcrow, 1994):

- high degree of perishability which require a rapid turnover, cooled transport and/or cold storage facilities,
- high mass with low unit-value ratio, which influences choice and transportation cost,
- significant difference in quality for the same product,
- production that, for climatic reasons, is restricted to areas and regions frequently far from markets,
- producers who generally specialise in the cultivation of a limited number of products, while the average consumer prefers a variety of fresh produce,
- additional tasks such as sorting, washing, grading, packaging, labelling, transporting, handling and displaying form part of the process of supplying a product, and
- a variable climate which caused production fluctuations which result in price variations from season to season, and even within seasons.

The unique characteristics of fresh produce and the production process in South Africa result in very high demands on price determination, the marketing process, the conducting of business at markets, the supply of products, the distribution structure and the actual distribution (HSRC, 1991).

7.4 Methodology

In order to explore the reasons for closer vertical coordination structured interviews were conducted amongst farmers that were already involved in direct sales to the retailers. Contact details for these were obtained from the retail groups. A population of fifty farmers were identified of which thirty were interviewed by means of semi-structured questionnaires.

The case study approach gained steady ground as a recognised scientific research tool in recent years (Sterns, Schweikhardt, and Peterson, 1998). Other way include experiments, surveys, histories, and the analysis of archival information (Yin, 1994). Case studies do not transfer knowledge in the traditional sense of stimulating lower-

order thinking skills. However, case studies have proved to be very successful in stimulating higher-order thinking skills e.g. stimulating discussion, promoting analytical thinking and encouraging readers to test hypotheses (Harling and Misser, 1998).

Case study research is more suited to the "why" and "how" questions in research (Yin, 1994). This questions addressed in this case are essentially related to the "why", the reasons, producers are contracting directly with retailers in stead of using the market mechanism.

7.5 Motivation for engaging in closer coordination with retailers: perceptions and evidence

Fresh produce markets are still the most important distribution channel for most vegetable producers in South Africa as indicated in Table 7.2.

Table 7.2: Vegetable buyers from farmers: difference between National Department of Agriculture and own survey

Vegetable buyers	Dept. of Agric.	Survey
Processing	11 %	4.0 %
Hawkers		6.7 %
Fresh Produce Markets	54 %	23.6 %
Direct sales (Retail)	32 %	57.0 %
Export	3 %	8.7 %

Source: National Department of Agriculture (2000) and own survey.

It is clear from Table 7.2 that the respondents market most of their produce directly to the retail sector. The farmers indicated that they only shipped their inferior produce to the fresh produce markets.

The producers were asked to respond to a range of statements in order to determine their attitudes towards delivering their produce to fresh produce markets or directly to a retailer. The results are presented in Tables 7.3 and 7.4.

Table 7.3: Reasons for delivery/non-delivery to auction markets (National Fresh Produce Markets)

Reasons for delivery	Average*	Standard deviation
Money is assured through a trust account	2.00	1.47
Better price paid for produce	2.00	1.68
The market is fair/just way of doing business	2.42	2.11
Any volume of produce can be sold through the market	2.67	1.97
The market always takes all my produce	3.00	2.2
Retailers will cheat farmers if the municipal market didn't exist	3.08	2.21
Less product specifications	3.33	2.47
Less quality controls	3.69	2.42
More possible buyers for my produce	4.00	2.08
Reasons for non-delivery		
No fixed relationship with market agent	4.57	2.98
My product quality is better than municipal market quality	5.89	1.96
My products are not sold on time and the quality consequently deteriorates	6.25	1.16
Better prices when delivering to other market channels	6.25	1.75
Unexpected price fluctuations	6.67	0.73

* Likert scale: 1 = not important and 7 = very important.

The questions related to the auction markets are split into two categories namely the reasons for delivery and non-delivery to these markets. Producers still see the market as a vehicle to get greater exposure to possible buyers. It is interesting to note that the farmers do not attach great value to traditional reasons for auction markets namely security of payment through the trust account system, better prices and a fair way of doing business. The respondents are also notably neutral about the setting and maintaining of standards and grades by the market.

Most interesting are the reasons for not sending produce to auctions markets. The importance of these aspects in the decision making of producers is reflected by fact that they have the highest values allocated to them in the entire survey – even higher than the reasons for direct marketing. The reasons for the direct marketing of produce can be categorised into risk, quality and price considerations.

Unexpected price fluctuations is the most important reason why producers are avoiding auction markets. Reducing price risk and uncertainty is one of the main reasons for vertical coordination (Bowersox, 1992). Other sources of risk are also of concern to the respondents. When farmers market directly to retail groups they engage in joint planning of production volumes and timing. This reduces the production risk and contributes to an assured market, which reduces market risk. Both these aspects are identified as very important.

Table 7.4: Reasons for delivering to a Retail Company (Direct Marketing)

Decision variable	Average*	Std dev
Reduction in transport costs	2.53	1.92
Reduction in packaging and product cost	2.53	2.03
Better market information from the buyer (more consumer information)	2.53	2.21
More market exposure for my private label product	2.71	2.08
I trust the retail company	4.00	1.69
Reduction in marketing costs by bypassing the municipal market	4.12	2.42
Credit finance from the retail company	4.24	2.58
Reduced production risk	5.06	1.71
I get an assured fixed price for my products	6.00	1.54
You are assured of a market	6.11	1.57
You can manage production volumes according to agreements/contract with company	6.17	1.46

* Likert scale: 1 = not important and 7 = very important.

It is also clear that producers are of the opinion that they get better prices for their produce through direct marketing in both sections of the questionnaire (reasons for delivery and non-delivery). Although prices are identified as important in the

decision making process stable prices are relatively more important which is congruent with rational risk management where farmers attach relatively more value to stable rather than high prices.

The ability of the fresh produce markets to maintain produce quality is one of the most important reasons why farmers are engaging in direct marketing. The efficiency of the market i.e. the speed with which a product is sold, is of concern to producers as product quality deteriorates when it is left on the market floor for too long. Several respondents noted that they sent only their low grade produce to the markets. This is supported by the low ranking of product specification and quality control by the fresh produce markets.

Finally producers are not of the opinion that they save any costs on transportation, packaging and product costs through direct marketing. They do not feel that they receive more information about the consumer through closer contact with retail buyers. However, the needs of the consumer is translated and communicated to the producer through the joint production planning process.

7.6 Identifying the most appropriate governance structure

Earlier in this case it was indicated that transaction costs could explain the choice of governance structure for a transaction. Accoring to Coase (1937) closer vertical coordination will be observed as the cost of using the market increases and firms attempt to minimise transaction costs. Williamson (1996) discusses frequency, uncertainty and asset specificity as determinants of governance structure. Hobbs and Young (1999) argues that the transaction costs are in turn influenced by the nature of the product. The nature of fresh produce causes quality uncertainty, price uncertainty, frequency of transactions and relationships specific investments.

Fresh produce buyers experience **quality uncertainty** due to the perishability of fresh produce. The quality is variable and not immediately visible as interruptions in the cold chain only shows up later when the product deteriorates at a faster rate. This problem becomes more complex as product differentiation becomes higher with different products requiring different storage conditions. **Supply reliability** increases

transaction costs due to the perishability of fresh produce requiring frequent replenishment of stocks, the range of different products stocked and seasonality of supply. Both buyers and sellers experience increased **price uncertainty** in the marketing of perishable products, prices have to be determined for differentiated product lines, and especially when the quality is invisible (see Akerlof (1970) for a full discussion on pricing and quality uncertainty). Sellers experience uncertainty in **finding a buyer** due to product perishability, when they are marketing unique or differentiated products, and when they have implemented quality assurance programs which might not be immediately visible, and therefore remunerable, in fresh produce. Fresh produce also require frequent replenishment and therefore the **frequency of transaction** also increases. Retailers and producers engage in **relationship specific investments** to ensure product differentiation (e.g. distribution centres and unique packaging) and to assure quality. All these transaction cost drivers are exacerbated by the introduction of products with new characteristics demanded by consumers. (Hobbs and Young, 1999; and Zuurbier *et al,* 1996)

Asset specificity is an important determinant of governance or coordination structure (see 4.3.1). Four distinct types of relationship specific investments are identified by Joskow (1993) namely site specificity, physical asset specificity, human asset specificity and dedicated assets.

Producers were asked to identify their investments in the relationship with the retailers or developments which they incurred in coordinating with retailers. The results can be viewed in Tables 7.5 and 7.6. In Table 7.5 it is clear that farming experience – the ability to produce a good quality product – and good quality control programs are important to be able to achieve the higher standards required by retailers. Relationships with retailers and to be at the right place at the right time (another managerial ability) are also important to enable producers to deal directly with retailers. The human asset specificity involved in the relationship between producers and retailers is not relationship specific investment, but investment in general quality. Managerial capacity to deliver the required produce and acquired relational and production knowledge are important in the coordination of fresh

produce transactions. The investment in quality programmes however, is relationship specific since most of the retailers require specific programs.

Table 7.5 Important characteristics to deal directly with retailers

Factor	Average*	Standard deviation
Have more farming expertise than the other farmers	5.40	2.02
Have a better product than another farmer	4.96	2.19
Have more and better technology	3.43	1.83
Being in the right place at the right time	5.40	2.06
Know someone in the retail company	5.03	1.99
Have a quality control programme	5.13	2.30

*Likert Scale (1 Not At All, 7 Yes Definitely)

In Table 7.6 investments in dedicated assets are observable. Investments in storage facilities, quality control and other facilities were indicated by the producers. Hygiene and quality control programs are especially important to assure food safety and quality to consumers. Producers had to make investments in storage facilities to ensure that the cold chain is not broken in the transportation process.

The uncertainties and asset specificities in fresh produce transactions discussed above can be interpreted at the hand of the model proposed by Williamson (1996) depicted in Figure 4.4. Williamson proposes that enterprises have three distinct governance structures from which they can choose to minimise their transaction costs. As mentioned earlier, this choice is determined by asset specificity, frequency and uncertainty. Producers indicated that asset specificity associated with direct selling to retailers is higher than selling at the fresh produce market. Therefore the asset specificity would lie somewhere between k_1 and k_2. The frequency of disturbance or uncertainty is relatively high, but apparently still low enough to still fall in the 'hybrid' governance mode.

Table 7.6 Dedication of financial resources due to closer vertical coordination

Investment	Average*	Standard deviation
Training	3.90	1.66
Quality programmes	4.77	2.01
Machinery/Equipment	4.42	2.29
New facilities excl storage	5.10	2.02
Labourers housing	3.26	2.21
Chemicals	3.90	2.23
Water quality	3.48	2.34
Storage facility and labourers hygiene	5.26	2.10
Social audit	3.23	2.41
HACCP/ISO 9001	3.58	2.14

*Likert Scale (1 Not At All, 7 Yes Definitely)

The Williamson model provides a lot of insight, but it does not expand on the type of hybrid mode of governance. As mentioned earlier, vertical coordination is a continuum ranging from spot markets to hierarchies or vertical integration. Mahoney (1992) proposes an expanded choice of organisational form as illustrated in Table 4.4. Mahoney uses three conditions to provide a framework in which coordination strategies can be predicted. These conditions are task nonseperability, task programmability and asset specificity. (See 4.3.2)

Traditional vegetable production and marketing falls into the category of **low task nonseparability**. The vegetables are graded according to well known standards and measures according to size, weight colouring and blemishes at the marketplace by independent personnel. Producers are rewarded according to the grade awarded to the produce and prevailing market conditions. However, new consumer demands for high quality produce, food safety, environmentally and socially responsible production practises and variety requires product characteristics beyond the traditional standards and grades (Boehlje, 1999; Drabenstott, 1995; and Zuurbier *et al*, 1996). These augmented product features cannot be clearly separated and objectively measured and therefore falls into the category of **high task nonseparability**.

The agricultural production process can be classified as **low task programmable**. Although agricultural production processes are well established, the uncertainty of the biological nature of agricultural production makes input measurement uncertain and not amenable to monitoring. The issue of **asset specificity** is discussed earlier in this case and is accepted as somewhere between high and low.

According to the Mahoney framework the organisational form of vertical control could be a spot market, relational contract or clan. Mahoney's framework predict the governance structures of choice in the marketing of fresh produce. The tension that exists between the spot market and direct selling to retailers was apparent in all the discussions with producers. The retailers and producers interviewed prefer relational contracts due to the high nonseperability of the characteristics of their produce. Asset specificity is not high enough to induce clan formation. It is however interesting to relate this aspect to the observations by producers in Table 7.5 that 'knowing someone in the retail company' is conducive to closer vertical coordination with the company.

7.7 The nature and result of vertical coordination in the fresh produce supply chain

The effect on the risks perceived by producers is presented in Table 7.8. Vertical coordination with retailers serve to reduce price and investment risk for producers. They do not have to expose themselves to the vagaries of the marketplace where they are never sure of a good price or buyer. They plan their production schedules in coordination with retailers in order to assure a market for their produce. The producers therefore successfully minimise transaction costs related to uncertainty by means of closer vertical coordination with retail companies. This is however only part of the reason as e.g. higher prices and quality considerations are also important reasons.

Table 7.8 Perceptions on risk reduction through closer vertical coordination

Risk	Average*	Standard deviation
Price risk	5.33	1.61
Quality risk	3.30	2.10
Investment risk	5.27	1.66
Quantity risk	4.97	2.01

*Likert Scale (1 Not At All, 7 Yes Definitely)

The differences in the relationship producers have with market buyers and retail buyers are recorded in Table 7.9. It is clear from Table 7.9 that retail buyers have a more extensive relationship with their producers. The most important difference is that retail buyers engage in annual crop planning – discussion on delivery times and quantities – with producers. Producers reduce the risk of finding a buyer for their produce and retailers assure the reliability of their supply (timeliness and quantity). Retailers and farmers also discuss the quality and standards of the produce to be delivered. This reduces quality uncertainty for the retailers and price uncertainty for producers. Retail buyers visit producers on their farms and assist them with farming problems. The quality risk and especially the 'invisible' quality is reduced as producers and retailers discuss production practises. This kind of effort indicates investment in relationship specific human asset specificity. Retailers are also enlisting independent quality controllers to do on-site inspection of production practises. A higher incidence of written contracts is noted, but the result is lower than four. Further interviews indicate that this points to a informal written production and delivery plan that some retailers put on paper with their producers. This is however seen as an informal joint production and delivery plan and not an enforceable contractual commitment to buy.

Table 7.9 Relationship characteristics of closer vertical coordination

Decision Variable	Market Buyer		Retail Buyer	
	Average*	Stdev	Average*	Stdev
Only money exchange, we never hear from each other again	2.19	1.85	3.77	2.40
Strictly business, not friendly	2.69	2.24	2.67	2.02
Friendly, speak often about prices on the municipal market	4.34	2.50	5.19	2.10
Buyer often visits me on the farm. In addition, helps me with farming problems	2.10	1.85	4.87	1.50
Discuss quality and standards	3.81	2.51	6.16	0.93
Discuss delivery times and quantities (annual crop planning)	2.81	2.22	6.16	1.51
Written agreement/contract	1.10	0.75	3.97	2.59
Buyer owns a part of the farm	0.77	0.43	0.94	0.25

*Likert Scale (1 Not At All, 7 Yes Definitely)

McLaughlin *et al* (1999) lists the **advantages of contracts** in the fresh produce industry as:

- Greater price certainty for retail buyers and producers. Producers get clear guidance on the type of produce, quantity and quality required by the market. This arrangement is especially advantageous to producers in low-price years on the open market in case of fixed-price contracts.
- Better knowledge of the quantities to be sold in the short and long run. This aids field production planning for producers, harvesting and packaging for transportation and distribution centres as well as procurement and advertisement scheduling for retail category managers.
- Contracting may encourage large retailers to conduct long-term market and demand analysis for fresh produce, including advertising and promotional effectiveness. Large firms are more able to finance such investments.

The **disadvantages of contracting** are:

- Low production leads to low income for producers with fixed-price contracts. Retailers and consumers benefit in this case.
- When open market prices are substantially different from contract prices there will be a substantial incentive for one of the parties to find a way to avoid performance. Price discovery is difficult in contracts.
- Contracting might increase the price variability on spot markets when the volumes going through these markets are substantially reduced by contracts.

7.8 Conclusion

Economic theory suggests that enterprises will attempt to minimise their costs. These costs include the costs of coordinating with other firms in the supply chain – the transaction costs. Firms will therefore over time adopt the governance structure with the lowest cost. The survey represents the attitudes and trends observed in a significant part of the fresh produce market. There is a definite trend away from the traditional municipal fresh produce markets as a marketing channel for fresh produce to direct marketing of produce by means of contracts with retailers. The reasons for this trend is lower price and market risk, better quality produce due to less handling and better prices. The reasons for the existence of fresh produce markets are not regarded as important by the producers surveyed. Producers were neutral about aspects like protection against exploitation, fairness of doing business, setting and enforcement of standards. Improved coordination in the fresh produce supply chain remain the most important trend in the supply of fresh produce in South Africa.

This trend was tested against economic theory in the neo-institutional inquiry paradigm. Transaction costs are an important determinant of governance structure. Asset specificity, transaction frequency and uncertainty in the Williamsonian framework indicate that a hybrid form of governance can be expected. This is also clearly observed in reality. The transaction costs theory therefore sufficiently explains the application of contracts to govern transactions in the vegetable supply chain.

The analysis was expanded at the hand of the Mahoney framework. Mahoney uses three conditions to provide a framework in which governance structures can be predicted namely task nonseperability, task programmability and asset specificity. Vegetable marketing transactions are found to be medium asset specific and low task programmable. The most significant insight from the Mahoney framework is that traditional vegetable transactions are low task nonseperable, while vegetables that satisfy new demands by consumers require transactions which are high task nonseperable. This also explains the trend from spot markets to relational contracts in the fresh produce industry.

This case finds that the reasons producers and retailers are engaging in closer vertical coordination are based in the transaction costs of using the market mechanism. New consumer demands and competitive strategies are increasing the costs of using spot markets. The trend towards closer vertical coordination confirms the insights from the neo-institutional economic framework. Producers and retailers are expected to continue this trend as they minimise their transaction costs over time to be more competitive.

Chapter 8 Structural Change in Agribusiness: The Case of Potgietersrusse Tabak Koöperasie (PTK)

Chapter 8 Structural Change in Agribusiness: The Case of Potgietersrusse Tabak Koöperasie (PTK)

8.1. Introduction

This case represents the other extreme of the vertical coordination continuum namely that of vertical integration. Asset specificity and strategic considerations like increased control of the product downstream in the supply chain argues for the use of vertical integration governance structure. The asset specificity is related to physical assets required in the vertical integration process and human asset specificity in the tobacco marketing networks. The Cooperative had to make a substantial investment in processing capacity to integrate vertically. This investment is highly asset specific since it would be very difficult to sell or to reallocate the assets to other uses. The Cooperative also needed to acquire knowledge on marketing and buyers. This knowledge is human asset specific and difficult to generate internally. The best option was therefore to acquire these skills by introducing tobacco marketers as minority shareholders in the vertical integration. The position of the governance structure is presented in Figure 8.1

The South African agricultural industry is undergoing major structural changes, as is seen in the changes in product characteristics, production and consumption patterns, technology, the size of operations (Kirsten and Vink, 1999) and the relevance of "supply chain" or "added value" integration (Van Rooyen *et al* 2000). Tom Urban coined the phrase "the Industrialization of Agriculture" at the turn of the previous decade to describe similar changes in the American agricultural sector, whilst Zuurbier (1999) described similar trends in Dutch agribusiness. Agricultural industrialisation describes the trend towards economics of scale through the movement to larger production units and the increasing occurrence of vertical co-ordination and integration between the various stages of the food and fibre system i.e. the supply chain (Antonovitz, *et al* 1996). Boehlje (1996) defines industrialisation as the application of modern manufacturing, production, distribution and co-ordination methods to the food supply chain. The Council of Food, Agriculture and Resource Economics defines industrialisation of agriculture in Sonka (1995) as an increasing

concentration of farms and vertical co-ordination (contracting and integration) among the various stages of the food and fibre system. The emerging system is expected to be highly competitive in global markets, more efficient, more responsive to consumer demands, less dependent on government assistance, and more able to rapidly adopt new technologies.

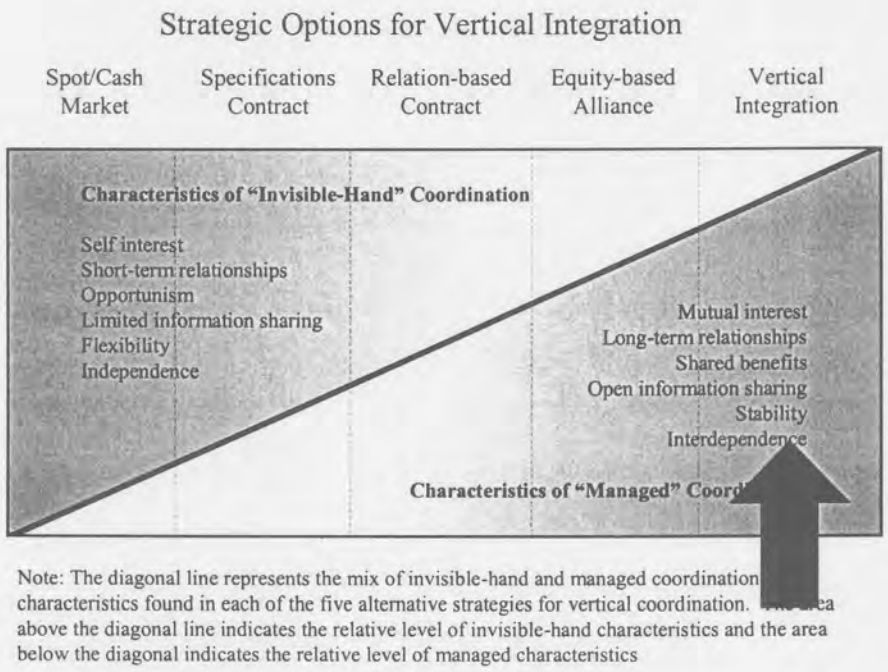


Figure 8.1: The position of the Aftobacco governance structure on the vertical coordination continuum

Source: Peterson, Wysocki, and Harsh (2001)

These trends have not yet been adequately researched by South African agricultural economists. The purpose of this article is therefore to (1) introduce the theme of structural change/industrialisation in South African Agribusiness and (2) explore, at the hand of a case study, the complexity of structural options and decision-making variables that managers have to face when considering vertical expansion.

The case study focuses on the vertical integration of the Potgietersrusse Tabak Koöperasie (PTK) to extend value adding by including marketing activities to their operations.

8.2 Background

The town Potgietersrus was established by the surrounding farming community in 1852, abandoned in 1870 due to disputes with the local population, and once again re-populated again in about 1886-1890. Various hardships such as "Runderpest", the Anglo-Boer war and the Rebellion befell the inhabitants of the region, including the "Great Depression" of 1933 (PTK 1966). On 14 June 1933 forty-six farmers founded the co-operative to organise farmers to build up negotiation power *"...om saam te staan en só bedingingsmag op te bou..."* (PTK, 1966). Against this background it is clear that PTK was established in a time of social hardship to counter the effects of unfavourable economic and social circumstances facing agricultural producers and rural inhabitants. The co-operative was formed to support its members by extending their activities and control over the product from production to include assembly, grading, packaging and auctioning. Overproduction, variable supply, and low export prices - always the bane of the farming sector - had to receive attention by the new co-operative. In 1939 drastic measures were considered to limit the oversupply of tobacco. The co-operative requested the Department of Agriculture to prohibit settlers to produce tobacco and it was even suggested to burn a part of the export quota!

Over the next few decades PTK established itself as an effective producers cooperative under the cooperative act. The early 1980's, however, introduced substantial reforms in the agricultural environment (Van Rooyen *et al.* 1997)

The Board of Directors of PTK called a extraordinary general meeting on 4 December 1998 to discuss the formation of a joint marketing company. Increasing pressure in the marketing of tobacco in the free market environment, anti-smoking legislation, and the onslaught on the RSA tobacco industry were cited as the reasons for the initiative. More specifically the co-operative was experiencing rising input costs, stronger competition in the global marketing of relatively low volumes of tobacco in comparison to the total market and increasing unit costs. (PTK annual reports)

Figure 8.2: Integration performed by PTK

The Board of Directors proposed the establishment of a joint marketing company with international experts. The envisaged results of this action were (PTK Annual Report 1999):

- training and knowledge expansion of PTK personnel to international standards by international experts;
- assistance with development of tobacco production in South Africa and other Africa countries;
- aggressive co-operation and assistance with possible production expansion by PTK members and other producers; and
- most importantly the procurement of unprocessed tobacco from African countries for processing and packaging in the PTK plant.

PTK expanded its production facilities substantially in terms of this "supply chain" vision. Increased throughput in the expanded processing facility is important to reduce unitary production costs or to realise favourable scale economics in manufacturing. The success of the vertical integration or supply chain strategy is

therefore directly linked to the success of the expansion in processing and marketing capacity.

Important aspects of the operational agreements between PTK and the new marketing company were (PTK Annual Report 1999): (1) equally shared accountability and contribution by both partners; (2) PTK members are still contractually bound to production credit agreements to deliver their total harvest to the co-operative; (3) the marketing company must set up an agreement with PTK with regard to the packaging and processing of tobacco; (4) the marketing company is responsible for the marketing of the total production by PTK members whether in South Africa or not; (5) profit is shared equally and consequently to PTK members through dividends/bonuses after PTK reserves have been attended to; (6) tobacco form producers that are not members of PTK can also be procured for processing and packaging by the PTK processing plant; and (7) separate agreements are applicable for tobacco processed by PTK for PTK members and processed by PTK for other suppliers.

A new company, Aftobacco (Pty) Ltd, was consequently set up with two tobacco traders as partners. The tobacco chain and the different integration by PTK are indicated in Figure 8.2.

8.3 Application of theoretical framework to PTK case

Williamson (1999) identifies four levels of research relevant to the economic inquiry into institutions. The first level deals with the informal institutions, traditions and norms that govern society for which social theory is of particular relevance. The second level address the institutional environment i.e. the 'rules of the game' for doing business, for which the economics of property rights and positive political theory are generally applied. Thirdly, governance structures related especially to the way firms align governance structures to transactions is analysed at the hand of transaction cost economics. Finally, neo-classical economics and agency theory is used to explain and predict the allocation and employment of resources within the firm. As noted earlier the objective of this article is to explore the governance

structures of firms in the agribusiness complex, which would specifically relate to the third level of economic inquiry in institutions.

Vertical integration can be defined as the consolidation of two successive production processes in which the output of the upstream stage is used as one intermediate input in the downstream stage. This consolidation removes the need for contractual and open market exchanges between upstream and downstream firms. These exchanges are replaced by internal exchanges within the consolidated firms. Such a vertical integration implies ownership and complete control over neighbouring stages of production and distribution. Various degrees of vertical co-ordination exist between the extremes of vertical integration and an open market. (Antonovitz *et al* 1996)

From a conceptual point of view it is first and foremost important to understand the incentives for structural change in the tobacco industry. Industries integrate vertically for various reasons. Cole in Mallen (1967) identified thirteen advantages to vertical integration for the enterprise: additional profit margins; decreased marketing expenses; stability of operations; certainty of materials and supplies; better control of product distribution; gratification of personal ambition; quality control of produce; prompt revision of production and distribution policies; better inventory control; ability to apply brand names to items produced and to enjoy the advantages thereof; opportunity for increased research facilities; greater buying power; and the ability to secure better trained personnel. He added that lower prices, maintenance of quality and better servicing of products would be the benefits that would accrue to the consumer through vertical integration (Cole in Mallen, 1967).

Ward (1997) sorted the motives for vertical integration into seven classes: decreased transaction costs; decreased risk and uncertainty; assured input or output supplies; corrected market failures; countered market power at an adjacent stage; created or extended market power; and avoidance of government restrictions, regulations or taxes.

Baumol (1997) limits the explanations for vertical integration to three basic motives: technical economics of scope; economics of internal production resulting from market failure; and the pursuit of aggrandisement or monopoly power

Secondarily, it is important to understand how the firm integrates vertically. As already indicated various degrees of vertical integration exist between the open market and total integration. However, it is not possible to explain the eventual structure at the hand of a single theory (Boehlje, 1999). Various disciplines, such as, value-chain analysis; economic theory, including transaction cost and principle agent concepts; strategic management and organisational learning; and negotiation/power, trust, and performance incentives, make valuable contributions to explaining vertical integration models. Transaction cost and strategic management theories are particularly relevant to the Potgietersrusse Tabak Koöperasie and were addressed in Chapter 4.

According to strategic management theory governance structures are determined by (a) internal considerations of costs, technology, risks, and financial and managerial resources and (b) external competitive considerations of synergies, differentiation, and market power and positioning (Harrigan in Boehlje, 1999). Harrigan (1983) identified bargaining power, strategy objectives, and industry traits (competitive position) as relevant to vertical integration strategies and proposed the following conceptual model for predicting vertical integration strategies within established industries:

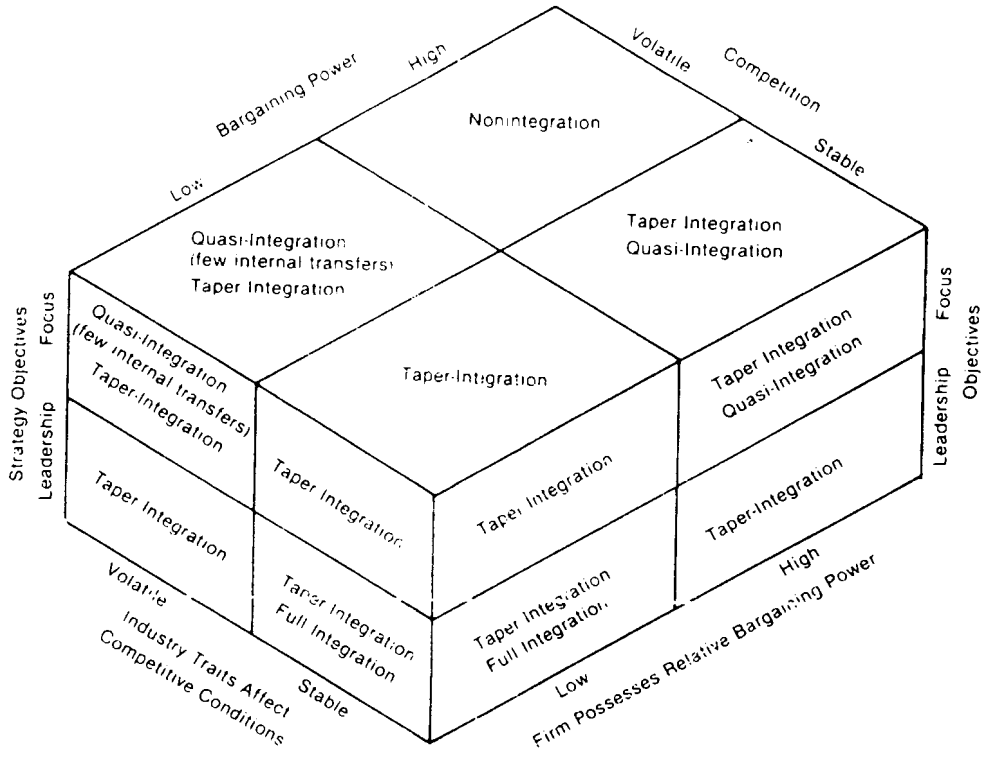


Figure 8.3: Illustration of the Strategy Framework for Vertical Integration within Established Industries

(Source: Harrigan, 1983)

8.4 Tobacco Agribusiness: Application and Observations

PTK embarked on the road of vertical integration to secure additional profit margins through decreased marketing expenses, higher throughput in the processing plant, and expanded markets.

Marketing expenses would be addressed in several ways. Technically the firms would avoid the costs incurred when delivering the tobacco to the auctions by delivering it directly to the buyers. These savings would be expressed in a competitive price position for the companies on the basis of reduced costs in the supply chain. The firms would be able to extract first mover, information and flexibility advantages from improved knowledge of both the (international) market information and (on-farm) supply conditions by linking the intelligence systems of producers and traders in the same company. Information advantages would also counter the effects of market failure. At the manufacturing and auctioning stages of

the tobacco chain oligopoly to monopolistic conditions did and still does exist. The initiative would counter market power in adjacent levels by efficiently addressing niche markets with a specialised product.

Ensuring a higher throughput for the processing plant would be imperative to extract technical economics of scale. The marketing company could reduce risk at the input and output sides of the processing stage by ensuring higher and more secure levels of product and thus ensuring high and constant delivery volumes that are required by manufacturing firms. The output of the firm would also be assured with a market to avoid inventory risk associated with non-sales of stock.

Expanded markets beyond South Africa could provide new marketing opportunities to PTK. However, when we mention expansion of markets one has to consider the aspect of aggrandisement or efforts to establish monopoly powers as mentioned by Baumol (1997). The question therefore: Is the vertical integration initiave an investment in management ego or is it based on sound decision making principles? Realistically one has to assume that there would always be a measure of managerial ego involved in these kind of decisions.

The vertical integration venture would also provide opportunity for better co-ordination between the market and the farmers. Information exchange would therefore be facilitated in the organisation leading to improved flexibility to realise market opportunities. Venter (1999) indicated that various initiatives have been launched in the South African tobacco industry to amalgamate some of the tobacco co-operatives.

The tobacco produced by PTK members is air cured in contrast to the more prevalent flue (oven) cured tobacco. The market perceives air cured tobacco as easier to handle due to its leathery texture and more aromatic particularly for pipe tobaccos. It therefore makes sense to strive to service niche markets with a niche product through implementing systems which do this as efficiently as possible. In this light it is clear that more advantageous scale economics could be realised, but PTK opted for the niche approach, while realising that in this process scale economics must be realised.

Chandler emphasised that structure follows strategy, and the management and directors of PTK had to identify an efficient structure to realise their objectives as efficiently as possible. From a transaction cost perspective PTK faced high asset specificity. An investment in tobacco grading, sorting and processing equipment was not transferable. Due to the location and socio-economic circumstances in the town of Potgietersrus any fixed infrastructure of the size and nature necessary to realise economics of scale and scope, would also have to be highly specific since there is no market in the town for fixed infrastructure of this nature. It is therefore clear that investment in the initiatives of PTK would be highly asset specific. As a consequence the risk associated with these investments would increase accordingly.

The transactions in the supply system are highly programmable due to their repetitiveness. The transactions can actually be facilitated through a low input system like an open market, which has been the system for the marketing of tobacco to date. A measure of uncertainty exists in regard to the nonseperability of transactions between the grading, processing and packaging functions and the marketing function.

The value added by sorting and grading is clear and relatively easy to quantify. The value added by marketing is not that easy to quantify, and varies according to the success of the enterprise. The division of the benefits of the initiative is therefore problematic.

A joint venture or vertical ownership is the most efficient governance systems to facilitate the tobacco market chain for a niche market as indicated in Table 8.1. The management also has to take the strategic environment into account in terms of strategic objectives, bargaining power, and competition in the industry.

PTK leadership opted for a strong strategy focus on the niche marketing of air-cured tobacco. The bargaining power of PTK is low in the industry since it is closely linked to the production of tobacco which takes place in a nearly perfect market. Bargaining power will increase as the initiative develops, but it will remain essentially small

within the global tobacco market. Since the tobacco market is mature the competitive conditions in the industry is stable.

Given these factors it would have made sense to implement taper integration as a vertical integration strategy (Harrigan 1983). Taper integration means that the firm would produce a portion of its requirements internally but purchase the rest on the open market. Taper integration would give the firm the advantage of full-capacity utilisation through fully utilising its own production, while external suppliers would be approached if excess capacity exists. (Harrigan 1983) This is also thus the governance structure that PTK implemented.

Chapter 9 Conclusions

Chapter 9 Conclusions

9.1 Introduction

The three objectives of this thesis were to elucidate the nature and extent of the emergence of supply chain management as a key performance area in South African agribusiness; to describe the manifestation of these trends in the agricultural sector; and to understand and explain the emerging governance structures in these supply chains.

The first objective was achieved by implementing a national survey on the nature and extent of the emergence of supply chains, future strategies and the drivers of these strategies in South African agribusinesses. The results of this survey also served to ensure the face and construct validity of the case studies. The case study methodology was used to address the second and third objectives namely to explain the manifestation of these trends in supply chains and to elucidate the governance structures employed in the process. The case studies were used to explain the "why" and "how" of emerging supply chains in the South African agricultural sector. The case study methodology was used since it is successful in stimulating higher-order thinking skills such as stimulating discussion, promoting analytical thinking and encouraging analysts to test theory against reality in line with the constructivist approach used in this thesis.

Three case studies were used to explore emerging governance structures in agricultural supply chains. These case studies focused on the marketing of potatoes, vegetables and tobacco. The case studies were specifically chosen to represent three examples along the vertical coordination continuum namely; market (potatoes), contracting or hybrid (vegetables) and hierarchy or vertical integration (tobacco).

The survey and the most important findings from the case studies are reviewed in this chapter.

9.2 The emergence of supply chains in the South African agribusiness complex

South African agribusiness managers were surveyed to identify the strategic direction of their businesses. The survey addressed the strategic direction, preferred present and future coordination mechanisms, strategic focus, the future shape of the agro-food industry and the major factors driving these trends.

South African agribusiness companies favour the market penetration and market development strategies. They will use current products to improve their position in current markets and also develop new markets for their current products. Agribusiness managers indicated that they will do this in cooperation or partnership with other companies (47%), or based on their own competencies (43%), or by merging with other companies (8%). This indicates a clear trend towards improved coordination between participants in the agricultural sector.

The current coordination mechanisms of choice are specification contracts and spot markets. In future specification contracts will decrease in importance, but still remain the most popular coordination mechanism. Relations-based alliances will surpass spot markets in importance. Equity-based alliances will also increase in importance in this trend while vertical integration will decrease in importance. There is a definite trend away from the spot market (invisible hand coordination) towards managed coordination structures. This implies that South Africa agribusinesses are moving away from the characteristics of the 'invisible-hand' coordination such as self interest, short-term relationships, opportunism, limited information sharing, flexibility and independence in favour of the characteristics of 'managed' coordination. The characteristics of 'managed' coordination are mutual interest, long-term relationships, shared benefits, open information sharing, stability and interdependence. The spot market is the 'cheapest' and most uncomplicated transaction governance structure due to the external control mechanism. The spot market becomes very 'expensive' when the opportunity costs of lost value is considered due to the misalignment of processes. When firms move up on the coordination continuum they incur coordination costs. They will only do this if the cost of coordination error or coordination benefit his higher than the coordination costs incurred. This indicates that South Africa

agribusiness intend to build more 'value' into the chain which needs to be protected by higher order governance structures.

Managers agree that the most important feature in the shape of the future agrofood sector will be electronic markets. This is against expectations as electronic markets could represent a particular innovation of the spot market, which are not regarded as very important by agribusiness managers. The managers indicated that electronic markets represent a globalisation of local spot markets which will change the nature of local markets significantly in future. Electronic markets are followed by a host of expected features which all indicate a strong trend towards supply chain formation and better coordination in the agribusiness sector. These features are vertically integrated supply chains, mergers, acquisitions and collusion between companies, more direct marketing from farmers to consumers and closer cooperation between local agribusiness and international commodity trading organisations. South African companies attached less importance to the impact of company size and the impact of global companies. This is ascribed to the importance of SMME's in developing economies. Local markets are not perceived as large and attractive enough to attract large numbers of global companies either. These perceptions are however already challenged by the presence of multinationals in the South African agribusiness sector.

The major factor driving the South African agrofood sector is company competencies. Local agribusiness are looking inward to improve their competencies to address new markets and face international competition. Changing consumer needs and information and communication technology follow company competency as the most important drivers in the agrofood sector. Supply chain formation and coordination are regarded as important drivers by agribusiness managers, especially coordination to ensure quality and to meet new consumer demands. These drivers will become more important as agribusinesses realign their strategies to focus on value-adding as a source of competitiveness. Value-adding strategies in the highly competitive food industry go beyond the traditional production, technology and product orientation to a service and quality orientation that encompasses customer and societal satisfactions, such as environmentally and socially responsible production practices. The low priority of factors such as environmental legislation and liability (ecology) and

economic empowerment (equity) which could be important aspects of social accountability in South African supply chains need urgent attention.

South African agribusinesses are still primarily commodity, production and process oriented. This is evident from the significance of, amongst others, electronic markets, focus on company competency, and the power drive. A significant trend towards customer-centred value-adding is however observable. These value-adding initiatives are driving the closer vertical coordination observed in the agrofood complex.

Commodity markets will increasingly be dominated by large multinational companies with significant scale and scope advantages. South Africa agribusinesses will be challenged to build their competitive advantage on product differentiation. Product differentiation is based on creating unique products which appeal to consumer needs. The emerging importance of societal values present various opportunities in this regard.

9.3 The Sandveld potatoes case study

The Sandveld potato growers find themselves stuck in a highly competitive commodity market with associated low profit margins. This case serves to illustrate the drivers for change and challenges to chain formation from the perspective of the potato producers. The whole argument can be related to the strategic choice between focus or differentiation that every enterprise has to face. The Sandveld potato producers are operating in a commodity market which requires a focus strategy. As mentioned earlier, the spot market is characterised by self interest, short-term relationships, opportunism, limited information sharing, flexibility and independence. The producers are not content to remain in the commodity market and should therefore differentiate the product that they provide to the market.

Important insights from this case are firstly, that the production and marketing of undifferentiated, homogeneous commodities are characterised by low asset specificity, low task programmability and low task nonseparability. The framework of analysis indicates that a spot market is the most efficient governance structure for the marketing of a commodity. The Sandveld producers are currently using a commodity approach in the production and marketing of their potatoes. The second

insight indicates that, in order to escape from the commodity market, the Sandveld potato producers will have to identify and add value to their product. Consumers must be willing to pay for this value and it must be relatively difficult to duplicate this value. This value will increase mutual interdependency among certain actors in the market, which is the basis of chain formation. If they cannot create such value, a market structure with closer relationships between the participants will remain the optimal governance structure. The third insight is into the factors which inhibit supply chain formation namely adversarial relationships, farmer isolation, volatile prices, and size imbalances between the participants.

Sandveld potatoes, like most agricultural products, are sold on commodity markets. The value created in a commodity market is fixed and auction systems are limited in their capacity to facilitate product innovation or differentiation. Innovation and product differentiation cannot be sufficiently guided nor rewarded in an auction market. Therefore, in the auction market, buyers and sellers compete for a fixed sum of value. This results in an opportunistic win-lose game characterised by adversarial relationships between participants. These adversarial relationships tend to isolate farmers from the rest of the supply chain. Traders also use this isolation as part of their bargaining power since it reduces the selling options available to potato producers. Cooperative innovation, to create products that will improve the competitive position of firms, is very difficult in such an environment. Isolated producers cannot implement and design effective marketing strategies either. The volatility of prices and supply in combination with opportunistic behaviour and adversarial relationships reduces the chances of establishing successful supply chain relationships. The volatilities increase uncertainty in the enterprises, requiring risk avoidance behaviour like higher stocks. Price fluctuations also increase the incidence of reneging on contracts as participants find better prices on the volatile spot markets. The size imbalance creates a power imbalance in the negotiations between participants in the potato market. This leads to an information imbalance, but also to more bargaining power for the buyers. The buyers will therefore have to coordinate with a big number of producers to initiate a supply chain. The sheer number of negotiations and partnerships leads to excessive coordination costs and buyers are not prepared to engage in a supply chain approach as a result.

It is clear that if the Sandveld growers still want to depart from the commodity market. They will have to follow a differentiation strategy to achieve this. The possibility of implementing a differentiation strategy decision depends on four factors:

- The first is the capacity of the producers to improve the coordination amongst themselves. This will reduce the coordination costs with the next level of the marketing system.
- The second is the possibility to promote new brands or regional identity to the final consumer and, more importantly, the willingness of consumers to pay for this identity.
- The third factor is the ability of the participants to create value for which consumers are will to pay by realising opportunities for improving production and logistical processes in the supply chain.
- The final factor is the prospect of setting up contracts between the participants which will give the right incentives to the different stakeholders to elicit the desired actions and to avoid opportunistic behaviour.

The key to supply chain formation lies in the creation of non-replicable value which consumers are willing to pay for. In the process of producing non-replicable consumer value mutual interdependency amongst participants will be created which will facilitate supply chain formation. Three systems for improved coordination are identified, namely partial horizontal coordination between some growers, full horizontal coordination between growers and vertical coordination between growers, processors and retailers.

Applying the analytical framework to the supply chain governance of the commodity potato market shows that spot markets will dominate. Transactions in potato marketing, especially at producer level, are characterised by low asset specificity, low non-separability and low task programmability. The spot market leads to the undesirable market conditions extensively discussed in the case. However, spot market transactions are the optimal governance structure for transactions in the commodity potato market as predicted by the framework of analysis. If potato producers want to establish a supply chain the first and most important aspect they

will have to address is the creation of non (or difficult)-replicable consumer value. Opportunities for value adding could exist in assured quality, origin, continuity and cultivar selection. This will increase the asset specificity and, as a consequence, the mutual interdependence of the participants in the market. An increase in asset specificity will form the foundation for the use of a hierarchy in the Williamson framework or a long-term contract in the Mahoney framework. However, the improvement of the processes and flows in the supply chain can only be improvements in efficiency and not value-added as such. Most of these improvements can be achieved through better coordination between buyers and sellers in the spot market and it is not necessarily efficient to move to the next level of in the coordination continuum.

Most potatoes and vegetables are sold on the national fresh produce markets as commodities. The next case illustrates how some vegetable farmers and retailers departed from the commodity system by implementing a differentiation strategy based on consumer needs.

9.4 The Vegetable case study

The second case focused on the use of informal contracts between vegetable producers and retailers. Consumer demands and retailer competitiveness were the most important drivers for chain formation in the vegetable sector. The most important insight from this case was that a spot market would be the most appropriate governance structure from a pure transaction cost perspective. However, when new consumer demands for product safety and quality were introduced to the transaction characteristics, the spot market was unable to facilitate the increased information requirement. The individual contribution to the final product was difficult to measure and reward in a spot market setting. Agency theory was used in combination with transaction cost theory to explain why relational contracts were the most appropriate governance structure. This case illustrated how retailer strategies, which are derived from consumer demands, drive the process of chain formation. Product characteristics, especially the perishable nature of vegetables, also played an important role as the retailers had to provide sufficient incentives to farmers to modify their behaviour in terms of quality control and assurance. An informal contract is the most efficient governance structure for this type of transaction. The vegetable case

study illustrates the use of hybrid governance structures or, more specifically, relational contracts between vegetable producers and retailers.

Consumer demands and the intense competition between retailers are the most important drivers for change in the vegetable industry. Retailers attempt to draw customers with wider offerings of high quality fresh produce at competitive prices on a year-round basis. To achieve this they had to implement efficient procurement systems to assure quality, continuity of supply and quantities. Technology, especially cold chain management and cultivar choice, enables producers and retailers to assure a continuous supply of high quality fresh produce.

The characteristics of fresh produce are an important consideration in the choice of governance structure. The perishability of fresh produce and the use of appropriate production practises are not immediately visible or measurable. The quality or 'freshness' depends on the maintenance of the cold chain in delivering the products to the distribution centres. Appropriate use of chemical agents to control pests on vegetable farms is important to consumer health and cannot easily be objectively verified in the marketplace. As mentioned earlier, retailers are interested in ensuring a constant flow of the required quantity and quality of produce along the supply chain. They experience uncertainty in using the National Fresh Produce Markets as they cannot always be assured of the required supply. To counter these challenges they engage in informal relationships with certain producers. Producers and retailers coordinate the supply (quantity, quality and variety) of vegetables by improving the information flow in the supply chain. The producers and retailers cooperate to improve the competitiveness of their supply chain by assuring a constant supply of high quality fresh produce.

Vegetable transactions are conducted frequently due to the perishable nature of the products. The asset specificity associated with vegetable production is also low. Vegetables are sold on the market every day with no reciprocal investments required between the participants in the transaction. A relatively higher level of asset specificity is observable where producers implement specific quality, training, manpower and human development programs required by the retailers. Uncertainty is also relatively high in the vegetable market due to supply fluctuations. The

Williamson framework would predict a market governance structure for procuring vegetables. However, as pointed out in the chapter four, agency theory makes an important contribution to the choice of governance structure. Two new factors are introduced namely task programmability and task separability. Vegetable farming is low task programmable due to the biological nature of the production process. Producers face constantly changing production conditions and have to adapt their processes accordingly. Traditional vegetable production and marketing is low task nonseparable because objective standards and grading at the marketplace address the information requirements of buyers and sellers. Consumers and consequentially retailers are concerned about the quality, continuity of supply and production practises used in vegetable production. Spot markets are not able to facilitate this kind of information exchange as transactions are conducted on price alone and along limited grades and standards which do not reflect the information required. These factors are not easily measurable and it is difficult to reward individuals for desirable behaviour or to monitor shirking. The required transaction is therefore highly nonseparable. The result is therefore, using the Mahoney framework, that a relational contract would be the most efficient governance structure to facilitate this kind of transaction. A relational contract facilitates production and procurement planning and assures quality and production practises in order to improve the efficiency and competitiveness of the supply chain created between the vegetable producers and retailers.

The trends observed in the vegetable sector are expected to intensify over time. Retailers will continue to invest in closer relationships with producers. Total quality management of all the production processes will increasingly be enforced through certification systems such as EurepGap. Price competition will still continue, but non-price factors such as societal values will become more important in future.

9.5 The Potgietersrusse Tabakkoöperasie case study

The final case focused on vertical integration in the form of a taper integration into the tobacco supply chain by the Potgietersrusse Tabakkoöperasie. Strategic considerations such as market power and position and lower unitary costs of production are the most important drivers in this case. The asset specificity of the required investments is the most important determinant of the optimal governance structure. The envisaged expansion of processing and marketing capacity required

substantial investment in highly asset specific investments. The cooperative therefore had to decrease its exposure to market uncertainties by vertically integrating into the downstream processes of processing and marketing. This case illustrates the importance of managerial strategy as the driver for the establishment of a supply chain. The importance of asset specificity in the choice of governance structure is apparent in this case.

Vertical integration or a hierarchy is discussed as the most efficient governance structure for the marketing and processing of air-cured tobacco by the Potgietersrusse Tabakkoöperasie (PTK). The members of the PTK produce a substantial quantity of air-cured tobacco as opposed to the more common practice of flue curing tobacco. Air-cured tobacco is easier to handle and more aromatic which makes it suitable for pipe tobaccos. The cooperative wanted to control the marketing of their product in order to improve the profitability of its members. The main reasons cited by the board of directors and management were rising input costs, stronger competition on international markets, rising input costs and relatively low volumes which translated into low bargaining power. A further reason was that the cooperative wanted to expand its market knowledge through closer coordination with the buyers further up the tobacco supply chain. More information will enable them to better plan the marketing and positioning of their product. The deregulation of tobacco marketing in the early 1990's opened up new opportunities to the cooperative. The strategy of the cooperative was to get involved in the next stage of the value chain namely the marketing or auctioning of their product to the manufacturers. The decision was therefore whether the cooperative should sell its product on the auction market or to sell the product directly to the manufacturers.

The increase in product and information flow will enable the cooperative to reduce overhead costs and gain a better understanding of the market. The processes and activities at the selling level are programmable and separable, but highly human asset specific as strong seller-buyer relationships are established over time. The increase in processing capacity is also highly asset specific. This is due to two reasons namely the specificity of the tobacco sorting and processing equipment, but more importantly the specificity of investing in factory space in the town of Potgietersrus. The town is small with a small industrial and manufacturing sector. It would therefore be difficult

to transfer ownership of these assets to another enterprise. Given these circumstances the most efficient governance structure according to the Mahoney framework would be a joint venture or vertical integration.

In the PTK case, strategic theory explains why the cooperative did not engage in full vertical integration. A taper-integration approach was followed to ensure that members will always be guaranteed of a market. A taper-integration implies that the excess capacity would be filled up with tobacco procured from other sources. This governance structure was primarily motivated by the focus objective of the cooperative's leadership. The cooperative wanted to serve and focus on the pipe tobacco niche and were aligning their resources and control over their resources in such a way to address this market as efficiently as possible. The industry is relatively stable since international demand is stagnating due to anti-smoking campaigns. A stable environment is conducive to fixed investments as opposed to a volatile environment, which would discourage large fixed investments. Finally, the relative bargaining power of the cooperative would be low in the international tobacco market because its production volumes are low in comparison to the total market.

PTK performed the taper integration by establishing a new company (Aftobacco) in partnership with two tobacco merchants. The cooperative owned a controlling share in Aftobacco. In this way they combined the tobacco merchants' marketing knowledge, required to sell their product, with their specialist knowledge on raw material procurement. The combination of these factors in a hierarchy improved the efficiency of the supply chain and the competitiveness of the participants in the chain. The critical variable in this case was the asset specificity of the processing equipment and physical infrastructure required for the venture. PTK had to establish more control over the marketing of the product to ensure sufficient return on investment as there was no other way to recover their investment due to the asset specificity. The human asset specificity of marketing networks also played an important role. PTK had to acquire these skills through acquisition as this knowledge (marketing networks) is difficult to generate. The strategy of taper-integration therefore made sense as it reduced the uncertainty associated with asset specific investments.

Consequential to the writing of the case the other shareholders in Aftobacco walked out on the venture. Although this was not studied in detail it seems that the most important reasons for the breakdown were related to interpersonal differences and misalignment of goals between the two companies. Apparently the most significant event was the appointment of a new manager at PTK who had new ideas on the management of the Aftobacco venture. The cultural differences, emphasised by statements from farmer members of the PTK board such as: *"The Aftobacco people do not work. They are never in their offices"* led to difficulties in the formulation and implementation of goals between the different stakeholders. Perceptual differences about the nature of the arrangement led to strategic and management misalignment. The co-owners in Aftobacco saw the arrangement as a joint venture while the PTK board, with the majority of shares, approached the venture as vertical integration. This led to considerable friction about the structures of authority, reporting and accountability between the two organisation. In this case the governance structure was theoretically sound, but the interpersonal and inter-company dynamics thwarted implementation of the envisaged structure. This event emphasises that the factors involved in successful supply chain management are vastly diverse, but significant.

9.6 Contribution of this study

This research was motivated by the apparent inability of the current positivist paradigm used and neoclassical economic instruments employed in agricultural economic research to explain the emergence of supply chains and the evolution of related governance structures in the agricultural sector (Doyer and van Rooyen, 2001). A constructivist paradigm was adopted in this study and as a consequence the methodology was hermeneutic and dialectical as opposed to experiments based on hypotheses used in the positivist paradigm. New Institutional Economics was used, although not exclusively, as the principal theoretical base of this study to understand and reconstruct the factors faced and the decisions taken by managers in governance structure choices.

This study contributes to the emerging body of agribusiness and supply chain management research in South Africa. The most important drivers of change and the future shape of the agrofood industry is described in detail. The emerging governance structures for vertical coordination are described and explored, creating a firm basis

for further study. This study did not attempt to create theory, but rather to apply and test different theories to explain the emerging governance structures in South African supply chains. New Institutional Economics proved to be useful in elucidating a substantial part of the research problem and is an important addition to the research arsenal of South African agricultural economists. The theory will grow in stature as challenges related to supply chain management in the agrofood complex attract the attention of more researchers.

Governance structures in agribusiness management and, in particular, to manage the supply chain deserve more attention in future. The importance of governance structures is clear from this study. It was shown that efficient governance structures can play an important role in enhancing the competitiveness of the agrofood sector. These structures should also be researched in combination with the positivistic paradigm in order to model and quantify some of the effects identified in this study. Agricultural economists should understand governance structures and especially their function in facilitating and creating consumer value. This will become more important as consumer value becomes less tangible. Supply chain governance structures will be challenged to trace and assure value in transparent supply chains.

The research philosophy presented an suitable way to approach research in supply chains. The application of the case study methodology enabled the incorporation of a range of complementary theoretical constructs in order to explain and understand the complexity of supply chain governance. Case study methodology also enables the researcher to introduce a wide range of observations to understand the context in which supply chains and governance structures are implemented.

This study contributes to the management of marketing and supply chains in the agricultural sector. The findings will provide a greater insight into the factors influencing the choice of governance structure. This will enable managers to reduce the cost, improve the efficiency and consequently enhance the competitiveness of the participants in the supply chain. Coordination, collaboration and supply chain management will become increasingly important in the agricultural sector. This study represents a new approach to analyse the complex interrelation of firms and supply chains that compose the South African agrofood complex.

9.7 Conclusions and observations for the future

Supply chain management is emerging as a key performance area for South African agribusiness managers. Supply chain research, and especially the governance aspect thereof, is strongly related to management sciences. As such, it involves many interrelated factors and disciplines to analyse and explain these factors. It is impossible to take account of the whole diversity of factors related to the governance of supply chains. However, the researcher is challenged to include and explain as many of these factors as possible. The constructivist approach to this research proved to be helpful to reconstruct and understand the challenges and factors management faced in the implementation of supply chains in their respective industries.

This study has shown that supply chains will be an important feature in the agribusiness landscape of the future. South Africa agribusinesses are currently in an inward looking phase in order to improve their ability to compete in current and new markets with new competitors. All indications showed that these businesses are already emerging from this phase to focus on expanding their market presence and power based on value-added products. They will do this in cooperation and coordination with other participants in the agricultural supply network, indicating the emergence of the supply chain management approach. The choice of governance structure is especially important as this structure facilitates the transactions in the supply chain.

A six step decision framework for choosing an appropriate governance structure in a supply chain system is proposed for further study and practitioners. This model is analogous to the framework of analysis used in the study. The notions of competitiveness and the need for supply chain performance are inherent to the decision framework. The six step decision framework is:

1. *Identify and analyse the drivers of change.* Agribusiness managers must be constantly aware of the implications (opportunities and threats) of consumer behaviour, competitive behaviour of other firms, technological innovations, changing supply structures and societal values on their strategic and market positioning.

2. *Choose a strategy and objectives.* The overall and specific strategies should be identified based on the analysis of the drivers of change. These would include goals and objectives, product:market and competitiveness strategies. Overall strategies can be cost leadership, differentiation or focus strategy. Specific strategies (on product level) should be identified to realise the overall strategy e.g. reduction of stock levels or assurance of environmentally friendly production practices.
3. *Determine the required supply chain processes to realise strategy.* The operational implications of delivering the product attributes required by the strategy, should be clearly identified. Environmentally friendly production practises will, for example, require the control of producer and processor compliance, and increased information flow to assure certification and traceability.
4. *Identify and analyse the characteristics of the required transactions to facilitate the supply chain processes.* The transactions analysis is based on the frequency of the transaction, investments required related to the transaction and asset specificity of these investments, uncertainty, individual behaviour, opportunism, trust, information asymmetry, bounded rationality, incentives, power, task programmability and task separability.
5. *Identify the optimal (most profitable) governance structure to facilitate transaction.* Given the transaction characteristics identified in step four, the optimal governance structure can be identified to facilitate the transaction and supply chain performance. This is basically a cost-benefit analysis of the consumer willingness to pay for the product attributes delivered by the supply chain (which is also the opportunity cost of non-delivery) versus the costs of coordinating and controlling the transaction.
6. *Evaluate the implementability of the proposed governance structure.* In reality governance structures evolve over time and there are many barriers that have to be overcome. Suitable partners must be identified, enough capital must be available for investments in the transactions and the ability and motivation of management to manage the supply chain across firm and functional boundaries.

There are some important assumptions in this decision framework that will require more research in future. The first is the assumption that all required transaction characteristics within as supply chain approach can be facilitated by some kind of governance structure. Some transaction characteristics can be illegal or immoral for example collusion and cartels. The possible governance structures will therefore be limited by formal and informal institutions. An important aspect that will require attention is the legality of supply chain governance structures in terms of the Competitions Act as it applies to vertical and horizontal coordination. The second inherent assumption in the framework is the causal linearity of the framework. In reality managerial decisions are complex processes introducing and evaluating various aspects at the same time.

Consumer behaviour and satisfying consumer needs are the foundation of competitiveness. The agricultural sector and agribusiness are continually challenged to create customer value in order to maintain and improve their competitiveness. South African agribusiness firms will increasingly do this in cooperation with other participants in supply chains. However, South African agribusiness firms will still have to expand their notion of competitiveness to include emerging societal values such as the environment and ethics. They will have to include these factors in their chain processes in order to compete with multinational companies which are already including these values.

The governance structure in a supply chain is of special importance since this is the structure or institution which facilitates the effective implementation and operation of the other chain dimensions. Supply chains are important in logistics and information flows, but even more important in the value creation process. As the concept of consumer value extend beyond physical product characteristics the value-added will become less tangible and nonseparable. This will drive supply chain formation and require governance structures that can assure sustainable and accountable practises in transparent supply chains and provide participants with the necessary incentives to implement these practices.