CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

Following the period of deregulation after 1994, the South African agricultural sector had to adapt to a new way of doing business. Although the vegetable sector was the least regulated of the agricultural sectors, deregulation also had a major impact on role players in the South African potato industry. During that time producers, processors and retailers had to face a weak South African rand with resultant high input costs and, in later years, a strong rand with resulting low prices and competing imports from overseas. Powerful international principles were adopted from the international market and altered the way business was being done. Supermarkets also fine-tuned their competitive strategies to address new demands from customers, which put even more pressure on the potato supply chain. Amid these circumstances, the producer body Potatoes South Africa (PSA) experienced a financial and management crisis, reducing its effectiveness, which meant that many initiatives to support the potato industry were put on hold. On 25 August 2004, the Minister of Agriculture approved statutory levies for the potato industry, which were promulgated in the Government Gazette of 10 September 2004. Income from those levies could accordingly be utilised for research projects, information services, administration and transformation ($\geq$10%). The possible approval of the levies also guaranteed an income to the PSA, which meant the organisation could, once again, engage and expand its service to the industry.

The study indicates that the potato industry and market share in relation to other staple foods in South Africa are declining; but not in terms of sales, rather in terms of market share as compared to competing products such as pasta and rice. This reality presents the key strategic challenge to the industry and the main justification for the research study. The industry has to think strategically and be more innovative in order to survive the decline in market share.

The Marketing Committee of the PSA recognises that the lack of attention to proper marketing and promotional strategies for potatoes has led to the product losing market share as compared to other starches. It is therefore important that the Marketing Committee engages in initiatives to increase the per capita consumption of potatoes and to improve consumers' perceptions of the product. The challenge of the study is to determine how the chain and the role players interlink with one another and what value is added at each level in the chain in order to pinpoint shortcomings, if any, in the chain.

Trends internationally indicate that minimally processed products are becoming increasingly popular with restaurants, food institutions and supermarket outlets. Consumers are also seeking to eat more 'healthily'. Many alternatives to traditional products have emerged. However, studies in the UK indicate that health concepts do not necessarily improve a product (Levis & Chambers, 1996). Consumers want a wide range of attributes in foods and increasingly regard food safety as fundamental to their well-being.

Consumers the world over became more demanding in the 1990s. That was highlighted by a study of German consumers' purchasing decisions, which found that they were influenced by appearance, colour, texture and flavour characteristics. Quality, rather than price, was the main selling point (Weber, 1995). It was found that the flavour of cooked root and tuber crops, which was a primary determinant in consumer acceptance, involve both taste and aroma. Each of these attributes can be substantially altered by plant breeding (Kays, Wang & Mclaurin, 1998).

With more consumers adopting the 'razing' or snacking habit, savoury snack sales continued to increase in major markets over the past few years. Market growth has also been boosted by the plethora of new processed products such as extruded snacks (UK, Euromonitor 1994).

Communication and biotechnologies are increasingly impacting on people's way of doing business and their daily lives. Communication technology means that information can be sent across the country and around the globe in fractions of a second. With the arrival of virtual markets, the tyranny of distance has become a thing

of the past. Consumers are able to purchase goods over the Internet and view digital images by means of hand-held computers in the middle of the Kalahari. Good and bad news about products, crop yield, quality, prices, as well as climate and market conditions, are becoming public knowledge globally. In an era when information is valuable intellectual property, it has never been more readily available.

Genetically modified (GM) crops are being grown in many parts of the world. These technologies focus on first-generation agronomic traits designed to improve efficiency of production (e.g. tolerance of herbicides and resistance to insects). Increasingly, modern transgenic crops offer product quality or other traits intended to provide specific benefits to consumers (Dunwell, 1999). It is expected that the transgenic approach will expand the range of potato varieties in terms of agronomic and quality traits and furnish new industrial products for agriculture in the future (Pehu, 1998).

GM crops include products with altered protein, starch, or oil quality, as well as examples with improved micronutrient or vitamin content. Much of the work, particularly that aiming to develop food with specific health benefits, is still at the experimental stage, but according to Dunwell (1998) there is no doubt that many GM foodstuffs, with an increasing variety of qualitative changes, will reach the market in the next few years.

While genetic engineering offers many potential benefits, these benefits come at a cost and require higher levels of management to attain. The successful introduction of transgenic crops requires successful transfer of information to, and adoption by, individual growers, for the effective expression of such traits.

1.2 PROBLEM STATEMENT

The role of fresh-produce markets (FPMs) in the marketing of potatoes is becoming less noticeable. These markets were originally established as a service to the public and to farmers, and were managed by local municipalities. FPMs used to receive the largest volume of produce, which translated into the highest sales flows. That gave producer organisations the opportunity to influence the volume of produce on the markets which, in turn, affected the price of produce. However, as local consumer

requirements became more and more sophisticated, the normal fresh-produce market systems seemed to be caught off guard – arguably because changing consumer needs were not effectively communicated.

New climates have emerged with the need for more tightly coordinated supply chains to ensure good quality, while well-preserved and well-presented products have led to retailers bypassing the markets to source directly from farmers. However, these markets still play an important role in price formation. In many direct contracts between retailers and farmers, market prices still serve as the basis for price setting.

From a study on potato production in the Sandveld area of the Western Cape (PSA 2000) it became evident – and that is in line with the trend towards more direct sales – that producers do not produce to the required market specifications. In addition, farmers are faced with the reality of production costs increasing faster than the price of potatoes, resulting in a price-cost squeeze.

It is clear that the potato supply chain has changed over the years and earlier approaches to strategic planning do not seem to be appropriate anymore. The supply chain is facing new challenges in terms of quality, coordination and product prices.

1.3 OBJECTIVES AND MOTIVATION

The main objective of the study is to evaluate the South African potato marketing chain to gain an understanding of the trends and forces driving the future of the potato industry. The aim is ultimately to guide the future marketing management strategy for potatoes in South Africa.

A secondary focus of the study is the cost structure of the potato industry in South Africa. That involves an in-depth study of the various channels in the chain and ways to quantify them in terms of monetary value and market share according to tonnage moved through each part of the chain.

The objectives of the study are to –

- conduct a strategic analysis of the potato supply chain in South Africa;
- quantify the volumes flowing through various channels; and
- perform a Delphi survey of the perceptions of the various industry role players.

The study is performed with the aim to critically evaluate marketing and promotions within the potato chain. A strategic marketing channel management programme has accordingly been identified to assist the Marketing Committee of the PSA with their evaluation.

1.4 RESEARCH METHODOLOGY

An in-depth literature study was used to determine the extent of the problem and to gain an overview of the background and theoretical framework. Questionnaires and personal interviews were used to reach key players in the potato supply chain, e.g. retailers, wholesalers, merchant packers, processors, fresh-produce markets and informal markets. The information was then processed and suggestions put forward to improve the understanding of the basic supply chain.

The next sections provide an overview of the different methods applied in each component of the study. Chapter 2 focuses on the understanding phase of the 'Model for the food distribution channels planning process' (Stern, El-Ansary & Coughlan (1996); Rosenbloom (1999); Berman (1996); and Kotler (2003)). Various models are available that cover the four Ps of marketing, i.e. Product, Price, Place and Promotion, in different ways. Stern et al (1996) developed a model for the planning process of food distribution channels as shown in Figure 3.1.

The 'planning model' provides the core framework for the study. As indicated, the focus is on the understanding phase of the model, and each of the first five steps is applied in the study. Although the study only focuses on the understanding phase, the next section will cover each step in detail. The questionnaire drafted for the study is attached as an annexure for reference purposes.

1.4.1 Strategic analysis of the South African potato supply chain

The supply chain problem was approached by examining a broad base of literature that encompassed elements of logistics, distribution, marketing, operations and procurement. Evaluations of secondary data and information gathered in interviews with downstream and upstream supply chain members were used to analyse the supply chain. The approach is that 'one cannot fix something if one does not understand what is broken'.

1.4.2 Quantification of the channels in the potato supply chain

The quantification of the channels was undertaken by looking at the quantity or amount of produce dealt with by each role player, i.e. the quantity of potatoes handled by each of the links within the chain. That was quantified in terms of volume and value. Since most of the data were available through the PSA, that merely involved verifying the existing data and collecting missing or outstanding information. A description of the various role players, their particular roles and their customer base follows in the next section.

1.5 OUTLINE OF STUDY

This dissertation consists of six chapters. The next chapter provides an overview of studies concerning the potato industries in other countries. Chapter 2 also describes various methods that organisations may apply to evaluate the success of new and innovative techniques introduced in their supply chains.

Chapter 3 discusses the research methodology in greater detail as an expansion of section 1.4. The focus is on the first three steps of the understanding phase of the 'Model for the food distribution channels planning processes'.

Chapters 4 and 5 provide feedback on the information garnered from the questionnaire and interviews, while recommendations are presented that relate to the South African potato supply chain. These chapters deal with specific assets in the industry, as well as contracts entered into by and between suppliers and processors.

Chapter 6 covers final recommendations and conclusions about the South African potato industry.

CHAPTER 2

AGRICULTURAL COMMODITY SUPPLY CHAINS: A LITERATURE REVIEW

2.1 INTRODUCTION

The theoretical basis for the research is laid in this chapter which covers a synopsis of the literature on the agricultural supply chain; historic and planning principles underpinning agriculture; and an overview of the entire supply chain. Chapter 2 further investigates product flow through the supply chain and provides a substantive evaluation of the supply chain.

The paradigm shift that was taking place worldwide (with new and innovative views about the supply chain) had gained momentum over the years. Because institutional re-engineering processes (including those within the PSA) often result in negative sentiments and a resistance to change, organisations are forced to consider the effects of internal dynamics when they decide to implement new and innovative changes.

There can be little doubt that supply chain management has become an important area of management research, yet very few literature reviews are available on the topic, especially as far as the South African potato industry is concerned. However, the literature review used in this research study provides a sound base for general research on supply chain management.

2.2 DEFINING SUPPLY CHAIN

For the purposes of the study the term *supply chain* (also called *commodity chain*) is used to refer to the overall group of economic role players (or the relevant activities of those role players) who contributes directly to the determination of a final product. Thus the chain encompasses the complete sequence of operations, starting with the raw material or intermediate product and finishing downstream (after several

transformation stages and value-add steps), whether it results in one final product or in several final products at end-user level.

According to Cooper & Ellram (1993) supply chains are the channels through which –

- products move from producers to consumers;
- payments, credit and working capital move from consumers to producers;
- technology and advanced techniques are disseminated among producers, packagers and processors;
- ownership rights pass from producers to processors and ultimately to marketers; and
- information on current customer demand and retail level product preferences passes back from retailers to producers.

Cooper & Ellram (1993) use the term *chain of production* to refer to the group of role players (or part of the group) who contributes directly to the production, transformation and delivery of a single agriculture or livestock product to its final market. Therefore, from the cultivation of sugar cane to refined sugar, or from the cultivation of cotton to the manufacture of textile articles, the supply chain approach enables the portrayal (from upstream to downstream) of the linkages of transformation and distribution which accords value to the resources of a country.

Inputs in the form of materials, money, labour and information, functioning as a system, are processed by organisations to produce outputs such as products, services and social benefits. As such, the organisation is part of a continuous feedback cycle from inputs to outputs. Supply chain analysis accordingly provides a critical view of feedback and transformation systems, and is essential for the effective management of the supply system.

According to Doyer (2002) agri-supply chains (the systems that provide food and other agricultural products to the final consumer) changed dramatically over the past years and promised to change even more in times to come. The supply chain, which was once characterised by autonomy and independence, was rapidly evolving into an intertwined system of varied and complex relations between the various role players.

Doyer (2002) believes that the various role players in the local agri-supply chains were abandoning their traditional competitive position towards each other, in favour of cooperation so as to compete more effectively in the international market. That increased prevalence of coordination and control mechanisms in chain organisation represents one of the most important evolutions in agricultural supply chains, and is collectively referred to as *supply chain management*. It is especially important that agricultural producers develop their supply chain management skills to stay competitive in the international and local markets.

2.3 THE VALUE OF A SUPPLY CHAIN APPROACH

Individual suppliers, producers and marketers who collaborate with each other through a supply chain are able to coordinate their value-creating activities and in the process create greater value than if they operated independently. Authors such as Mahoney (1992); Cooper & Ellram (1993); Giupero & Brand (1996); and Doyer (2002) elaborate on motivations for this particular form of collaboration between supply chain participants.

Mahoney (1992), Cooper & Ellram (1993), and Giupero & Brand (1996) further argue that supply chains create synergies in one of three ways:

- They expand traditional markets beyond their original boundaries and thus increase sales volume for members.

- They reduce the delivered cost of products below the cost of competing chains and thus increase the gross margin for the working capital committed by members of the chain.

- They target specific market segments with specific products, and differentiate between service, product quality and the brand reputation of the products they deliver to these market segments, thus increasing consumers' perceptions of delivered value.

These authors argue that supply chains thus allow chain members to charge higher prices. Generally, however, supply chains increase market contestability both at the producer (farmer) end and at the consumer end of the chain. At the consumer end, chains compete primarily through price, differentiated products and services, and differentiated terms of sale. At the producer end of the chain, supply chains compete with one another primarily for 'producer affiliation' and core vendor commitments.

In addition, the producer affiliation implies a long-term relationship between producers and other members of the chain, and is based on process integration, stability in supply and greater investment in their efficient integration into the chain. Rather than having unaffiliated arm's-length transactions, supply chains substitute intra-corporate, contractual or franchise affiliation, thereby enabling them to transfer risk among participants in the chain. In that way, supply chains effect and progressively increase competitive advantage based on specialisation among partners in the chain. Many producers in developing countries could benefit by joining supply chains. Indeed, only through affiliation to a chain could producers determine whether they would be able to target their production at upscale, product-differentiated markets or at downscale, commodity markets.

Agile and innovative agric-supply chains allow producers to improve their gross margins, increase their savings from cash crop sales, and adapt their products, value-add processes and channel alignment to dynamic market circumstances. Competition among chains for the best producers allows producers to rise above a price-taking relationship to strategic affiliation within supply chains. The forms of association among supply chain partners are varied and include the following: corporate affiliation, contractual affiliation, membership in a trading community, or membership in a producers' cooperative.

Cooper & Ellram (1993) argue that well-designed supply chains are capable of realising several kinds of captured value for their participants. For example, they ensure, by means of –

- quality control, that exacting product requirements, i.e. eco-certification, of retail customers are met or exceeded in each step within the chain;
- innovation in products, production/distribution processes and chain alignment, that individual chains compete successfully with other chains based on superior product quality, price-to-value, value-to-cost and, importantly, logistics innovation, and that the chain itself continuously adapts, in its design, component competencies and market feedback systems, to dynamic market requirements;
- the compression of the order-to-delivery cycle, improved demand forecasting, quicker supply response and 'strongest link' financing of the entire chain, so that the working capital required to produce and deliver marketable products to end consumers is minimised;
- risk management, that production/delivery/sale risks are appropriately allocated both among chain participants based on their capacity to manage specific risks, and to third parties when these participants cannot effectively manage specific risks; and
- competitive chain management, that the value premises underlying the chain's design are continuously tested, validated and adapted to changing circumstances.

Saturation of food markets and changing consumer demands, powerful application of information and communication technologies (Van Beek, Beulens & Meffert, 1998; Hammer & Champy, 1993; and Davenport, 1993), and the internationalisation of the agric-industrial sector are the major forces affecting supply chain development, bringing about the strategic realignment of traditional buyer/seller relationships along the chain. Moreover, consumer demands regarding the ecological and socio-economic sustainability of agricultural production and issues of food safety are pushed more and more to the fore.

Van Beek et al (1998); Hammer & Champy (1993); and Davenport (1993) pose the following questions in terms of surviving in such a highly competitive environment:

- How can agri-industrial organisations (including farmers and growers) continually gain insight into changing consumer demands – both locally and internationally – and how could they dynamically respond to these demands?

- How can food safety be guaranteed, what are the international quality standards for agric-industrial products, and how can the quality of food products be maintained during primary production, processing, distribution and storage?

- How can production processes be structured so that value-add may be maximised to strengthen the international competitive position of companies involved, as well as the economic structure of the country?

- How can producers benefit from the application of sophisticated logistics management methods that continually increase the speed with which products move through distribution channels, while buyers desire to pull the precise mix and volume of products they want through their channels?

These authors argue that dealing with the above challenges exceeds the capacity of most single companies and farming operations. Moreover, many opportunities exist for partnerships in the form of (cross-border) agric-supply chains. Experience demonstrates that new markets (and market segments), new varieties and new services can best be developed through partnerships among suppliers, input providers, marketers and customers. However, in order to take advantage of emerging opportunities significant investments are required, especially in the key aspects of supply chain partnerships and integration.

Evaluating an agric-supply chain is a complex task, and therefore a good deal of knowledge and expertise is required; specifically, knowledge regarding such chains, which includes several interrelated types:

- Knowledge about product design and packaging

- Knowledge concerning market requirements and customer preferences

- Knowledge about production/distribution processes and their integration.

Supply chains facilitate the sharing of these three types of knowledge among chain participants. It follows that knowledge about supply chains concerns the functioning of the chain as a whole. It helps to integrate and interconnect production, distribution, processing and trade at each level of the chain. Although knowledge about chains is necessary for developing a workable architecture, knowledge within chains is also essential for assuring sustainability. Knowledge within chains concerns the execution of specific functions within the chain, e.g. chain marketing, logistics, and information flow. Chain engineering integrates these two fields of knowledge by gaining a general understanding of supply chain concepts, but also by acquiring a thorough insight into the crucial interrelated processes within the chain (Pointer, 1999).

2.4 SAMPLE STRATEGIES FOR AGRIC-SUPPLY CHAINS

According to Giovannucci (1998), three general strategies (with possible variations) apply to the structuring and management of agric-supply chains, namely chain differentiation, internal chain quality assurance, and chain process realignment.

a. Chain differentiation

Chain differentiation refers to setting up supply chains in order to respond to the demands of specific market segments. With the increasing choice of food products on offer, consumers are continuously making new demands concerning food products and service, thus placing greater demands on the suppliers. Subsequently, the chains of production have to diversify to satisfy new demands.

b. Internal chain quality assurance

Consumer choices are increasingly being determined by requirements in terms of the quality and safety of food, bringing about the introduction of new standards, for

example Good Agricultural Practices. To meet these standards and guarantee the quality and safety of food, agri-industrial companies and retailers need to develop and implement internal chain quality assurance concepts in agri-supply chains in collaboration with their suppliers and customers, and set up tracking and tracing systems (Ross, 1994). Supermarkets in countries such as Australia implemented Total Quality Management programmes and Hazard Analysis at Critical Control Points (HACCP) rules for perishables and fresh produce such as fruit.

c. Chain process realignment

The re-engineering of logistical operations within chains is very important. In particular, the development of global operations by a number of companies requires supply chain reconfiguration and process re-engineering. While markets are becoming increasingly competitive, with producers/suppliers seeking to avoid inefficiencies, they are also converging, and business practices are benchmarked and replicated. It therefore becomes necessary to seek out every source of competitive advantage, whether based on cost reduction, cycle time improvement and postponement of value-add and asset productivity gains, or customer value-driven initiatives.

The South African supply chain needs to be measured against the above strategies to determine which of them will suit the particular situation best. The PSA Marketing Committee then needs to determine which strategy will benefit the institution most in the future.

2.5 MODERN SUPPLY CHAINS

Supply chain management traditionally assumed that the demand pattern was exogenous. Hence, the demand for products was viewed as the key driver of the supply chain. Demand was either a point forecast, or in more sophisticated settings, a forecast with mean and variance, based on statistical or other scientific methods. These days, many technology solutions are available to improve the accuracy of such forecasts and to use the characteristics of demand to drive the inventory, replenishment, production, and capacity plans of the enterprise.

However, according to Lee & Billington (1993) demand is never truly exogenous. In other words, demand may be adjusted to the supply of a supply chain through effective marketing. Another aspect of the enterprise, i.e. sales and marketing, also uses its own instruments to influence demand. These instruments include the following: pricing, promotions (discounts, rebates, and many other types), product mix or assortment, shelf management, order lead-time, and other special deals (terms and conditions). A common challenge of supply chain management is that either the people who manage the supply chain fail to recognise that demand is actually influenced by the enterprise's sales and marketing group, or, conversely, the sales and marketing group fails to use the appropriate instruments that truly maximise profits or other objectives of the enterprise. Several enterprises paid dearly for not addressing this mismatch.

Sussams (1994) provides good example from the mid-1990s: Volvo was faced with exactly such a problem when the company found itself with an excessive inventory of green cars in the middle of the year. Eager to get rid of the inventory, the sales and marketing group started aggressively offering special deals, discounts, and rebates on green cars to the distributors. The good news was that the scheme worked, and such cars started to sell. The bad news was that the supply chain planning group, not recognising that those deals were in place, erroneously thought that customers finally liked green cars. As sales of green cars increased rapidly, they decided to produce even more of them to meet the seemingly increased demand. The net result was that Volvo was left with a huge inventory of green cars at the end of the year.

On the other hand, setting marketing instruments without regard to the true supply chain cost of the product could also be costly. For a long time, a leading pasta manufacturer offered special price discounts to customers who ordered full truckload quantities. The said marketing deals, however, created customer order patterns that were highly spiky and erratic. Supply chain costs (manufacturing, inventory, and handling) were so high that they outstripped the benefits gained from the transportation of full truckloads.

2.6 COLD CHAINS

One type of chain that is particularly relevant to the agricultural industry is the cold chain concept. All equipment and processes used to protect chilled and frozen foods in the fruit and vegetable supply chain are collectively referred to as the cold chain. Although the potato industry is not particularly dependent on cold chains, as opposed to other agricultural products such as lettuce, it is nevertheless dependent on stable product temperatures in the chain. The cold chain involves a physical process that dominates the supply chain logistics of certain processed foods. The integrity of the cold chain has to be preserved from the point of production or processing, through each of the transport phases – loading, unloading, handling, and storage – and needs to be extended to storage at the household or restaurant which consumes the product. Management tasks, from an engineering point of view, include the need to monitor temperatures, install and maintain equipment, move products rapidly, plug in the refrigerated containers, and keep the doors on cold storage units closed. Temperature requirements vary among food items; whether chilled or frozen (they even differ between types of frozen foods). For example, ice cream needs to be held at a lower temperature than frozen vegetables.

While the mechanics of the cold chain represent an important component of supply chain management for chilled and frozen foods, to focus only on the engineering aspects narrows the perspective on the networks that comprise the cold chain and the food businesses that rely on them.

It is therefore important to consider the broader value-based concept of the chain advanced by Omta, Trienekens & Beers (2001):

> Chains are considered to be composed of the actors in these networks which vertically work together to add value to customers. A chain is defined as the processes linking supplier and user companies, from the initial raw materials to the ultimate consumption of the finished product.

The above definition emphasises the purpose of chains in adding value. Certainly, well-maintained cold chains allow sellers to move a product from its point of origin to a location where there could be more consumers or consumers who considered the product to be of higher value. Time constraints are also eased when cold chains function well. Companies are able to supply products for longer periods of time than was previously possible, which facilitates market timing and enhances value. At a minimum, it may be said that the cold chain component of certain networks serves to preserve value. As a value-preserving mechanism, the cold chain is a necessary condition for world trade in certain higher value foods.

Companies sometimes prefer the option to 'buy' cold chain services rather than develop their own cold chain along with their marketing business. Features that assist companies to 'buy' cold chain services relate to specifications, monitoring, and pricing. Buyers that provide clear and feasible specifications in terms of quality assurance are more likely to find suppliers that are able to meet their particular requirements. However, companies that lay down very stringent specifications more often chose to internalise these operations or develop single-source supply relationships. When supply relationships involve other companies, outside inspection from government authorities and certification by international accreditation agencies are available to assure minimum performance in accordance with the basic needs of a specific cold chain.

Finally, the most important factor in terms of outsourcing the cold chain services is pricing. Buyers need to be willing to pay variable costs associated with the level of quality desired. The premium paid for quality erodes quickly when users notice lower costs, while lower quality services in the same market exert leverage in price negotiations. Although it is more common for the best quality cold chain services to be heavily utilised (implying a willingness to pay for quality), opportunistic behaviour by buyers reduces incentives for private investment in cold chain infrastructure. A close relationship between chain partners, perhaps including long-term commitment, would mitigate the potential of price negotiations to affect the availability of a high-quality infrastructure.

Although quality relates partly to best practices that can be taught or paid for with variable inputs, quality in the cold chain depends more on investments in modern technology. Quality usually involves fixed costs – for purchasing new equipment, computerised control systems, or renovation – and pricing strategies to recover fixed investments that are more problematic in a competitive market.

2.7 CONTRACTUAL ANALYSIS

According to Goodhue (2000) an agricultural contract refers to 'contracts used to arrange for the transfer of agricultural products from farms to downstream users such as processors, elevators, integrators, retailers, or other farms'. Goodhue accordingly believes that an agricultural contract is a means to limit price and income risks or reduce the cost of using spot markets to arrange transactions.

> Contracts can be structured in such a way as to exercise market power by restricting entry, limiting price competition, and they may also facilitate discriminatory pricing (Goodhue, 2000).

An agricultural contract is usually generic and covers a grower, the specific production inputs to be supplied by the contractor, the quality and quantity of the particular commodity involved, the production practices to be used, and the manner in which compensation is to be paid to the producer. While in the past significant attention was focused on production contracts with large corporate agricultural processors, the latest trend is that farmers themselves are becoming contractors. For example, a potato farmer may contract with a neighbour for the raising and/or breeding of seed potatoes.

Production contracts are not new to the agricultural sector. Seed contracts, vegetable contracts, and even livestock contracts were used in agriculture for many years. Several potential advantages exist for producers who consider entering into production contracts. Such contracts provide a more stable income for producers by reducing traditional marketing risks. Production contracts also allow producers to benefit from technical advice, managerial expertise and access to technological advances provided by contractors. Moreover, agricultural production contracts

provide producers with guaranteed markets, provided that commodities are produced in accordance with the contracts.

Finally, such contracts allow producers to increase the volume of their business with limited capital, since contractors often supply the necessary production inputs. However, it needs to be borne in mind that before a producer enters into any production contract he or she must carefully assess the risks associated with a particular contract. Frequently, such contracts require substantial long-term capital investments. For example, when a producer prepares a proposal to raise hogs under contract, a significant improvement to existing facilities will be required to comply with the contract. That means a long-term obligation to a lender to finance the costs of improvements. Similarly, certain crops require specialised equipment to grow and harvest crops successfully. Before entering into any contract, producers must pay close attention to the provisions of the contract which stipulate the term of the agreement, and the ability of the contractor to terminate the agreement. If a substantial investment is required to perform the contract, producers must ensure that the contract provides sufficient safeguards to allow recovery of investment.

Supply chains depend greatly on contractual agreements to assist with the effective flow of products through the chain (as discussed in Chapter 5).

2.8 RE-ENGINEERING THE SUPPLY CHAIN

The realisation that a paradigm shift is required in terms of supply chain management is a first and crucial step for any company that contemplates re-engineering. The second step is to re-strategise and re-structure the company's supply chain, as well as its traditional management structures.

Hammer (1998) defines re-engineering as the fundamental rethinking and radical redesign of business processes so as to achieve dramatic improvements in critical contemporary measures of performance such as cost, quality, service, and speed. Hammer perceives the supply chain as the cutting edge of contemporary re-engineering.

Sabbath and Frentzel (1997) insist that re-engineering based on cost reduction will continue to help certain companies, although few organisations have downsized their way to long-term profitability. Instead, long-lived prosperity lies in revenue growth. Successful supply chain companies often follow one or more of three key growth strategies: customer franchise management, new product development, and channel management. Each of these strategies depends on supply chain innovations. Importantly, to be able to implement these strategic opportunities successfully, a company must have a solid foundation to support it. This includes the ability to consistently and reliably execute supply chain processes that provide superior value to the customer.

Sabbath & Frentzel (1997) evaluate the growth of supply chain companies and pinpoint key drivers for profitable growth that are common across a wide range of industries, from computers to basic manufacturing. Successful companies pursue the following strategies for growth and are accordingly able to re-engineer themselves in the process:

- They focus selectively on aggressively developing and managing the most profitable customers.

- They become exceptionally effective at rapidly developing large numbers of new products that offer superior value to customers.

- They find and develop the most effective ways to connect customer segments with their products and services.

Parker (1962) describes the impact on other parts of the organisation if the supply chain finally adjusts to a higher standard. However, there is still room for substantial improvement in this regard, particularly in terms of the performance of the physical distribution functions of marketing, which constitutes a major part of total marketing costs.

A revolution within the supply chain would and could have far-reaching effects for all the sub-systems in the organisation. Parker (1962) also believes that there is a fundamental distinction between supplier-retailer relationships and supplier-retailer collaboration. Collaboration is possible only when detailed and proprietary information (such as sales and forecasts) is exchanged between supply chain partners. It is the quality, depth and openness of those relationships, not the quantity, which are important and which lead to true supply chain collaboration.

Sheffi (1990:27-39) shares the same fundamental principle, namely that re-engineering the supply chain will have a vast impact on organisations. He indicates that during the 1980s organisations began to examine the viability of developing strategic alliances and partnerships with logistics service providers. Sheffi believes that organisations are beginning to explore the 'make or buy' decision within logistics, and are focussing less on the manufacturing options. As organisations such as the PSA come head-on with competitive pressures, shrinking budgets, transportation deregulation and demands to improve customer service levels, they will have to start outsourcing portions of their logistics activities to third parties.

Hammer (1998:67) describes the supply chain as consisting of inter-company processes and relationships, or as the way in which pairs of companies, or even larger groups of companies, coordinates their individual activities to make things better for everybody. Hammer continues that the next big wave of opportunity lies in knocking down the walls between organisations and their customers, and between organisations and their suppliers.

Superior supply chain strategy and execution are critical enablers to successful growth. The cost-reduction message repeated by senior executives over many years resulted in logistics managers who were experts at cutting costs and downsizing at the expense of other members in the chain. Evidently the prevailing growth imperative requires a new way of thinking. Modern supply chain managers accordingly need to understand how to align their operations to support and foster growth.

In a study conducted by Sabbath & Frentzel (1997:3), logistics managers were asked to identify their top three barriers to implementing new supply chain approaches.

Seven out of ten respondents cited resistance to change as the biggest impediment. To assist organisations in managing change, a culture open to change must be brought about by focusing on three key areas, namely communication, participation, and alignment.

Sabbath & Frentzel (1997:3) note that there are many empirical studies that quantify the relation between supply chain excellence and above-average growth, and outstanding bottom-line results. However, very few companies succeed without a well-managed supply chain strategy. Often the challenge is not to convince senior management of the benefits of supply chain management and its effect on key managerial issues, but rather to assist the organisation to make the actual change and re-engineer its business processes.

As re-engineering becomes a reality, organisations need to consider certain key elements in order to remain competitive. Ganeshan & Harrison (1999:10) describe these requirements as covering two broad categories, namely strategic and operational decisions. Strategic decisions are typically made over a longer time horizon. They are also closely linked to corporate strategy, and guide supply chain policies from a design perspective. Operational decisions are short term, and focus on activities on a day-to-day basis.

Cooper & Ellram (1993) define strategic planning as a process of identifying the long-term goals of the organisation and the broad steps necessary to achieve these goals over the long term, thereby incorporating the concerns and future expectations of the major stakeholders. According to Pearce & Robertson (1997:3), strategic planning and implementation is a set of decisions and actions that results in the formulation and implementation of plans designed to achieve a company's objective. The importance of proper planning cannot be overemphasised, even more so in the supply chain where shareholder value is often diluted.

Quite evidently, the supply chain plays a critical part in achieving the strategic goals set by management. Proper planning and the integration of logistics into the overall strategic plan of an organisation are critical elements for the long-term success of strategic planning.

2.9 SUMMARY

Effective supply chain management continues to elude many organisations. However, most organisations utilise a supply chain in some form or the other, because organisations usually act as transformation systems whose inputs are processed to deliver outputs (such as fresh produce). Organisations need to realise that changing the current supply chain process is no easy task. Changes need to be managed in conjunction with established procedures of change management, and although short-term gains are not that easy to calculate, the long-term prospects of a re-engineered supply chain are immense.

Organisations also need to realise that, however painful that may be, the potato supply chain in South Africa is in dire need of change to regain market share, and re-engineering is essential to achieve improved performance. Moreover, as the planning and execution of a re-engineering process may be extremely complicated, proper planning and the involvement of strategic partners are imperative to the process.

The re-engineering label may also be viewed from another perspective. Organisations that approach the supply chain as the nucleus for growth are sending a very positive and inspiring message to other participants in the chain.

Various supply chain models have been developed to assist organisations in streamlining the supply chain. However, the following question needs to be answered: Can any of the models be integrated into the existing strategy or will organisations have to rethink the reason for their existence? Simply choosing and implementing a model will, however, not guarantee success. Companies need to ensure that other criteria are also met before excellence can be achieved.

The next chapter introduces the research methodology used for this study.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

Globalisation impacts on every step of the production and marketing chain. As the large international companies at both ends of the production and supply chain continue to increase in size, producers need to become progressively more focused. Those involved in the supply chain will be able to survive by providing specialised services to larger companies who choose to outsource their non-core business competencies. In addition, franchised production and supply chains need to define core business more accurately and focus their attention on every phase of the chain.

Consolidation is taking place at all levels of the supply chain in response to greater competition for market share, declining margins, saturated markets and the need to increase efficiency by means of economies of scale. The key to profitability is to focus on specific market segments and to provide a value-add service.

While the previous chapter focused on providing a definition for and background to the supply chain, and stressed the importance of supply chain management, Chapter 3 is reserved for the research methodology used to obtain a strategic overview of the potato supply chain in South Africa. As indicated in Chapter 2, the research study focuses on the understanding phase of the 'Model for the food distribution channels planning process'. Chapter 3 describes the various methodologies implemented to gain an understanding of the nature and dynamics of the South African potato supply chain.

The following tasks were performed within the channel. Firstly, target groups were identified; secondly, the flow of the product throughout the chain was established; and thirdly, perceptions were gathered in order to perform an analysis of the supply chain. The study was undertaken in close cooperation with Potatoes SA (PSA), a key player in the South African potato industry, while the researcher provided the overall

framework. The PSA's good standing in the industry played a valuable part in garnering reliable information and ensuring cooperation from the sector.

The information is required to develop a future marketing strategy for the potato supply chain, and to evaluate the advantages and disadvantages of different demands. It is also expected to provide an idea of the quantities flowing through the various parts of the chain.

3.2 SUPPLY CHAIN PLANNING/EVALUATION

According to Kotler's (2003) four Ps of marketing, i.e. Product; Place (distribution channels); Price; and Promotions (communications), distribution channels constitute an important source of competitive advantage, more so than the other three Ps. As far as products are concerned: Global competition and technology transfers between companies make it easy to promptly copy new products and attributes from competitors. As far as price is concerned, companies are able to operate in various parts of the world, creating offers at the lowest prices possible. As regards communications, customers' massive rate of exposure to advertising creates barriers to product differentiation. Effective distribution, however, creates a stable competitive advantage because it enables marketing channels to run according to long-term planning and implementation, within a consistent structure and within stable relationships. Various models have been developed that use the four Ps of marketing in different ways. Stern et al (1996) uses the 'Model for the food distribution channels planning process' as indicated in Figure 3.1

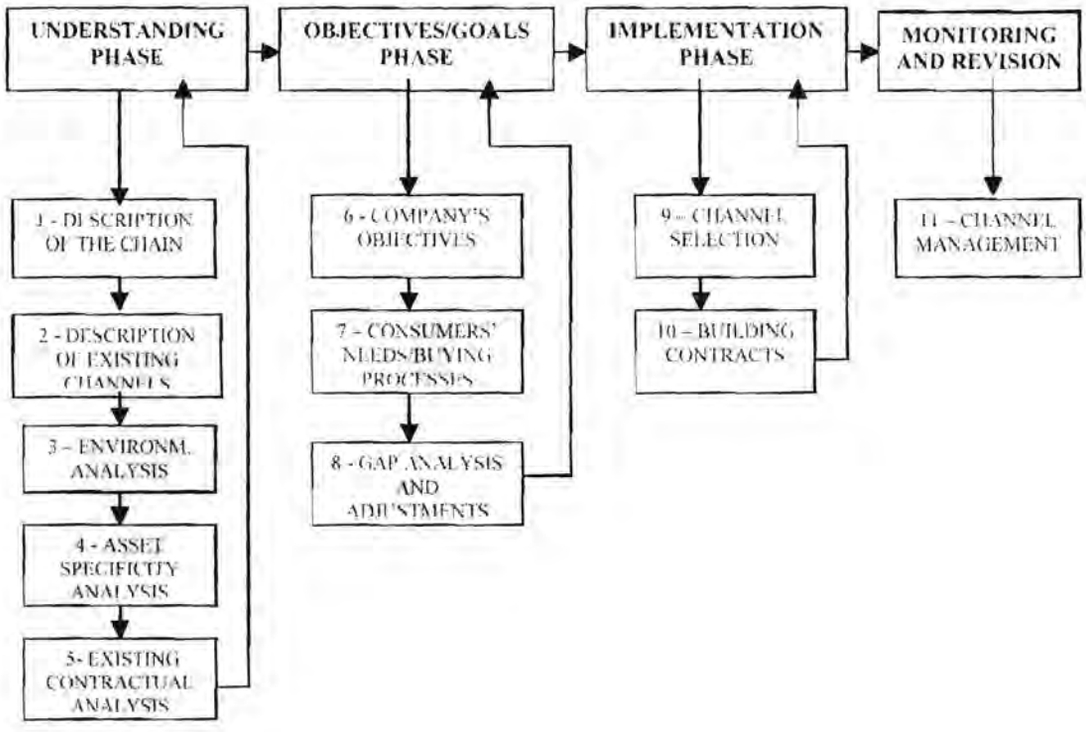

Figure 3.1: Model for the food distribution channels planning process

Source: Neves, Zuurbier & Campomar (2001)

The above model provides the core framework for the study. The focus is on the understanding phase of the model, and each of the first five steps is applied in the study. Although the study only focuses on the understanding phase, the subsequent sections cover each step in detail. The questionnaire designed for the study is attached as an annexure for reference purposes.

3.2.1 Description of the chain

According to Neves et al (2001), the purpose of the model is to describe, in chart format, all the role players in the chain, from first suppliers to final consumers. The model begins with an 'understanding phase' (for new distribution systems, the process starts from zero). In this particular phase the model aims to facilitate a general overview of the main industries operating in the chain and, by means of its systemic approach, to provide an analysis of competitive chains. If a company is operating in the poultry, red meat, sugar, orange juice, or milk business, for example, just one

system needs to be described. However, for companies operating in more businesses, all the systems (chains) have to be described, inserting the agents which perform the functions of negotiation (suppliers, farms, industry, wholesalers, retailers and others) to the product flow. Given the trends towards traceability, it is even more crucial to have a complete picture of the chain.

3.2.2 Description of existing channels

Neves et al (2001) believes that all agents who perform functions in the channel (part of the chain) need to be reviewed, which will make it possible to obtain a more accurate view of the industry concerned. An analysis of the consumption data, industry numbers, major companies and other information also needs to be undertaken for this purpose. Having established the aggregation level of the industry, the channels of the individual company are described next. The latter may differ from the industry channels, as certain channels may not be in use. Sales and financial data need to be provided to understand which channels are the most important in terms of the company's sales and profits. Flow tables are used for all channel participants to document whether or not they perform the required functions, whether or not they are able to perform these functions, and which actions or improvements relating to the specific function they are required to take.

Table 3.1: Flow table

FUNCTION	ACTORS	ALTERNATIVE SOLUTIONS

Source: Rosenbloom (1999)

According to Rosenbloom (1999), the following factors need to be considered as functions, each with its own flow table:

Product and services flow: inventory management, product transportation, product modification and after-sales service, processing a product for specific needs,

providing technical service, the product itself, the procedure and handling of returned products, promotion of product availability, packaging, dealing with specific packaging requirements, evaluating new varieties, after-sales follow-up, preserving quality, and others.

Communication flow (from company to final consumers): sales promotion to final consumers, information about product features, advertising, providing a sales force, frequent visits/face-to-face contacts, packaging information, loyalty programmes, web site participation, traceability information, and others.

Information flow (from consumer to company): sharing knowledge of local market, scanning data (access to computer data), complaints via web site/service line, order frequency, consideration of order formats, arranging information with regard to consumption, and others.

Payments and financial flows: conducting credit checks on final consumers, billing customers, caring for specific customer orders, arranging for credit provisions, price guarantees, financing, and others.

The brief is to identify the role players, outline the chain, and then position the various role players in it. Once the activities and role players in the potato chain have been identified, their interaction is indicated in a functional analysis table, including: the principal functions in the chain (i.e. the stages of processing and transport); the specific role players carrying out the functions; and the principal product of the chain in the various forms into which it is transformed in the course of the chain.

It is usual to start with the primary activity of the agricultural production of the commodity that gives its name to the value chain being analysed, e.g. potato, maize or rice. Thereafter it is possible to –

- follow the product downstream, through various marketing and processing channels to the final market; or
- identify the upstream principal providers of inputs and services which feed into production.

In this way, the commodity can be followed through its successive transformations. Once the activities and role players in the chain have been identified, it is useful to show their interaction in a functional analysis table, including –

- the principal functions in the chain (i.e. the stages of processing and transport, as well as any activities associated with the supply of inputs which may have been added);
- the role players who are carrying out these functions; and
- the relevant products in the chain (i.e. the principal product of the chain, in the various forms into which it is transformed in the course of the chain).

Although the functional analysis table would seem to be a simple tool, it is an indispensable one, both as a construct for ensuring analytical clarity and as a useful presentation tool. (A functional analysis of the South African potato industry follows in the next chapter.)

The functional analysis table presents an important research tool as it provides a construct for ensuring analytical clarity and may be used effectively for presentations. A commodity flow chart is applied to represent the information in a functional analysis table. This provides an easier way to present information, as it visually highlights the complexity of the interactions and flows between role players where the physical flows are quantified, both in physical and monetary terms. It is also a useful tool in achieving clarity in the subsequent stages of analysis, thus ensuring that no part of the chain is left out.

Table 3.2: Functional analysis table of the potato supply chain

Stage of the chain	Function	Role player	Output
Seed	Seed production	Seed potato producers	Potato seed delivered to the farmer
Production	Cultivation	Potato producers	Table potato delivered to raw commodity traders
Raw commodity	Marketing Transport Final sales	Wholesalers – table potato Retailers – table potato Exporters – table potato	Table potato delivered for final consumption
Plants	Processing	Chips plant – potato chips French-fries plant – potato French-fries	Chips delivered to retailers and exporters French-fries delivered to retailers and exporters
Processed commodity	Marketing Transport Final sales	Retailers of chips and French-fries Chips exporters French-fries exporters	Chips and French-fries for final consumption

The first stage in quantification is to construct the production-trading accounts for each role player in the chain and to calculate the following for each: value of production, intermediate input costs, expenditure on salaries, financial charges and taxes, and a measure of annual depreciation, etc. The key amounts of value-add, gross profits, and net profits are then calculated. In order to measure the overall efficiency of the chain, the distribution of income and the creation of value-add are subsequently determined. It is important to note, however, that the value chain analysis technique is only as robust as the quality and interpretation of the data on which it is based, i.e. either physical or monetary data (Thompson, 1994).

Once the flow diagram has been drawn and the nature of the flows between the different role players has been clarified, the next step is to quantify the flows, both in physical and in monetary terms. This allows for the assessment of the relative importance of the different segments or sub-chains within the chain. Although for aiding interpretation it is useful to draw a matrix of the flows between role players in order to clarify the nature of the products linking them, information on these accounts was not available and the study accordingly depended on industry estimates.

3.2.3 Environmental analysis

According to Neves et al (2001), environmental changes are unanticipated changes in the circumstances of exchange. The bigger the uncertainties, the higher the motivation for companies to seek governance structures that minimise transaction costs (Williamson, 1985). The traditional 'step analysis', which evaluates socio-cultural, economic, technological and political factors, presents a useful tool and is well documented, e.g. Johnson & Scholes, 1997; Mintzberg, 1994; and Kotler, 2003. However, the research study does not focus primarily on an environmental analysis of the supply chain. The purpose is rather to evaluate certain factors that may impact on company and industry channels in the future. In addition, insights are offered into specific analyses of drivers and implications regarding distribution channels.

Table 3.3: Possible impacts of the external environment

Drivers	Implications	Probability	Impact

Kotler (2003) provides the following insights into the various environments:

Possible impacts of the economic environment: income changes, education/professional level, employment, exchange rates, interest rates, economic integration, supplier concentration, buyer concentration, business life cycles, Gross National Product (GNP) trends, capital and financial availability, inflation, energy availability, natural environment input constraints (water, air), tourism expenditure, and others.

Possible impacts of the political/legal environment: market access (protectionism), package recycling laws, antitrust policies, economic integration (commercial blocks), labelling requirements, packaging constraints, types of communication constraints, tariff barriers, taxation policies, employment law, government stability, subsidy policies, product and/or process certification, and others.

Possible impacts of the technological environment: new technological solutions, mail sales, phone sales, internet sales, scanners, computerised stock, just-in-time deliveries, electronic data interchange (EDI), point-of-sales (POS) data, electronic funds transfer, automated ordering, technological transfer, efficient consumer response (ECR), cellular phones, and others.

Possible impacts of the socio-cultural environment: demographics concerning gender, age, race and age, time, scarcity, individuality, security, convenience, leisure, social mobility, income distribution, attitudes to work, lifestyle changes, family sizes, and others.

Some factors of the institutional (legal) environment are used in distribution contracts (or strategies). An analysis of the specific institutional environment of the country concerned should also be carried out, so as to verify whether the most common tactics to be used are feasible in the particular market. For this step it is essential to consult specialists (lawyers), and to determine which actions the company should take if any of the listed factors materialise.

The following table may be used to obtain an overview of the process, which has the advantage of forcing the company to consider alternative plans to deal with environmental changes.

Table 3.4: Table of impacts and reactions

List of all high impacts	Company/Channel/Chain actions

Having analysed the environment, a complementary action is to evaluate the distribution of power in the channel. This provides a greater strategic understanding of the business and what the company may expect concerning negotiations, availability of channels, private labels, and other factors. Channel power refers to the ability of a channel member to control or influence the marketing strategy of an independent channel member at another level in the channel, possibly making them

change their behaviour, or perform an activity that they would normally not perform. The main sources of power are those of coercive, reward, referent, expertise, persuasion, legitimate and information power (Lusch (1976); Hunt & Nevin (1974); and El-Ansary & Stern (1972)).

It will therefore be possible to produce tables concerning the sources of power in the channels, including issues of planning and impact, and how to deal with them (i.e. strategies to reduce power imbalances). By using the following model, companies can evaluate the power sources of the main agents that are used, or will be used, by rating them, for example, on a scale of 0 to 10:

Table 3.5: Power of channel sources

Sources of power	Agent 01	Agent 02	Agent 03

Lifestyle changes and consumption patterns relate not only to the level of potato consumption, but also to the type of product preferred by consumers.

Food safety became a key issue in supply chains during the past twenty years. Initially, concerns revolved around chemical residues. More recently, however, the focus shifted to food poisoning from human pathogens borne in both fresh and processed food. Debates on genetically modified foods are part of food safety concerns.

The requirement for food to be produced using environmentally responsible systems is high on the agenda, since the global community has become increasingly concerned about the environment and sustainable production. Salinity and land degradation, increasing pressure on scarce water resources, pollution and its impact on vegetation through acid rain, physical infrastructure, and the quality of air and water, have increased the need to manage resources in sustainable systems.

3.2.4 Asset specificity analysis

The asset specificity analysis is important for building contacts and relationships, as it provides insights into how to organise and coordinate the transactions in the channel. According to Anderson & Weitz (1992), there is a relationship between asset specificity and channel integration. The most important assets are physical-specific assets, time-specific assets, information and knowledge technology, human-specific assets, location (site) specificity, and marketing/transaction specificity. Completing the following table will assist with the analysis:

Table 3.6: Physical-specific investment analysis: infrastructure and facilities

Types of assets/investments	Degree of specificity	Reallocation costs
	(High/Medium/Low)	**(Impossible, High, Medium, Low)**

Based on analyses by Bello & Lohtia (1995); Klein, Frazier & Roth (1990); Kozak & Cohen (1997), and the interviews conducted, the following factors were identified as being pertinent to an asset specificity analysis:

Physical-specific investment analysis – infrastructure and facilities: equipment, special storage structures, tailored production facilities, product demonstration facilities, specialised warehouses, repair and service centres, and other investments in distribution channels.

Time-specific analysis – refers to time pressure to complete the transaction (flow): shelf life (how perishable), frequent/rapid deliveries, seasonality of production and consumption (inventory needs), and other time-related aspects.

Information and knowledge/technology-specific asset analysis: EDI, electronic data exchange investments, software, management process by product category, joint logistic planning process, joint quality programmes, setting up of traceability programmes, joint generation of new processes, stock management processes, and others.

Human-specific asset analysis: the labour force required, general training of distributors, joint sales training, knowledge of production process, market knowledge, product brand knowledge, and others.

Site-specific asset analysis – refers to physical locations: proximity needs (transport costs), energy supply, water supply, disposal of materials, strategic position of inventory, location of distribution centres, and location of outlets (point specificity).

Marketing/Transaction-specific investment asset analysis: conjoint brand development, joint planning and advertising, packaging development, publicity efforts, and others.

Transaction costs refer to costs related to the occurrence of a transaction, or of governing the system (Klein et al, 1990), which costs arise before and after the transaction takes place. Such costs are normally not strongly considered in business analysis, but are very important in choosing strategies.

Ex-ante transaction costs: price information search, product selling uncertainty, selection of alternatives, time taken by negotiation, writing of contracts, searches for quality information, and seeking buyers and sellers.

Table 3.7: Table of transaction costs: possible source of transaction costs in the company's distribution channels, the impact (high/medium/low) and how to reduce it

Transaction costs	Impact	How to reduce it?
(Types)		

Ex-post transaction costs: monitoring performance, redesigning contracts, renegotiations, monitoring property rights, monitoring the copying of technology, monitoring brand use, adaptation, legal disputes, non-delivery risks (supply), and risk of losing contracts.

A separate table may be completed for each channel. Subsequently, a more specific analysis of ways to reduce transaction costs may be performed.

Assets specificity can be regarded as an input into the value-adding process. One of the most critical concepts in supply chain analysis is that of value-add. Many calculations focus on value-add created by individual role players. By way of illustration, a productive role player may be seen to be represented by a box. As inputs flow into the box, products flow out of it. Inputs into the production process may be divided into two groups:

- Factors of production which are totally transformed or consumed during the accounting period, i.e. intermediate inputs.

- Factors of production that are only partially utilised during the accounting period, where they provide inputs to the production process over a number of years before being fully depleted, i.e. investments and goods.

Value-adding measures relating to the creation of wealth and the contribution of the production process to the growth of the economy are fundamental principles not only in supply chain management, but also in every kind of analysis concerning economic growth and development. Value-add may be calculated using a production account, which traces the various processes involving goods and services, corresponding to the flows of inputs and outputs (Thompson, 1998).

3.2.5 Existing contractual analysis and benchmarking

It is important to gain an understanding of how relationships within distribution channels are governed, how products are distributed (the function of coordination forms, general contract practices, buying procedures/processes), and how best practices may be evaluated. Companies therefore have to decide if what they are proposing in the next step is attainable or whether that will involve additional negotiations and learning costs.

3.2.6 Objectives of a company

The objectives of a company or organisation such as Potatoes SA have to be in line with its strategic planning programme or at least have to be consistent with its price, product and communication strategies. Objectives (goals) have to be set in relation to several variables, for example volume, profit, sales margins, turnover of inventory, market share, customer satisfaction, sales expenses, return on investment in channels, expense of inventory, overall customer service level, volume (units) by product type, volume per salesperson, volume per quota, profit by supplier, volume by product type, profit by product type, and others.

In terms of behaviour, the most important factors which must be taken into account include service departments, processing of warranty claims, the building/facilities, office systems, employee incentive plans, coverage of trade area, product knowledge/salesperson, selling skills/salespeople, dealerships' financial plans and business plans, advertising and promotion programmes, the number of customer complaints, buyer credit management, accuracy of sales forecasts, sales calls (total number), current customer calls, non-customer calls, number of product demonstrations, and others. As part of the above step, companies need to produce various tables, forecasts and other types of goal-setting tools. Some useful insights are provided by Berman (1996); Stern et al (1996); Rosenbloom (1999); and Gattorna & Walters (1996).

3.2.7 Consumer objectives, needs and the buying process

Conducting market research among final consumers and intermediaries so as to gain insight into the so-called perfect distribution system (from a consumer's point of view) forms part of this step. The high cost of marketing research means that the particular type of research depends on the nature of the company and its particular objectives. Building customer-driven distribution systems remains of the essence (Stern et al, 1996). According to Gattorna & Walters (1996) and Kotler (2003), several methods are available to measure consumer satisfaction. First, when designing the market research procedure, it is important to determine the service and product

expectations held by consumers, as well as their buying patterns. For this stage, a qualitative study to generate a list of relevant service and product attributes based upon customer experience will certainly yield interesting results. The resulting list could subsequently be used to draft a questionnaire for the quantitative phase. Literature on market research (Malhotra, 1996; Hair et al, 1995; Aaker & Day, 1982) provides useful information and techniques in this regard.

3.2.8 Gap analysis and quick adjustments

The potato industry offers a wide variety of ideas and viewpoints concerning consumer needs and the structuring of distribution channels. They must all form part of the Gap analysis to ensure that the best and most feasible strategic decisions are made for the industry. All goals are to be matched to market (consumer) and industry restrictions. According to Stern et al (1996), 'quick adjustments' refers to a step that organisations or companies can introduce to gain insight into various other steps that have previously been instituted to improve performance, any number of which can immediately be implemented in existing channels if they are evidently advantageous.

3.2.9 Selection of channels and negotiation

Once goals have been set, the company may select its channel structure and channel members, i.e. if it is flexible enough to do so (which depends on the availability of agents in the channel, the kind of relationship to be created and several other factors evaluated in the preceding steps). Various techniques are available for the negotiation process. A framework to build successful negotiations is provided in the research of Lusch (1976).

3.2.10 Building contracts and relationships

The above step involves the design (drafting) of written or other types of contracts (e.g. oral agreements) with partners in the channels, or selling by means of market transactions or other forms, depending on the suggested forms of coordination established in the previous steps. Other aspects include contractual safeguards against opportunism in the channel, means of enforcement and adaptations to changed

circumstances, building exit barriers, design, as well as the monitoring of incentives. When designing contracts, participants must consider possible conflict sources, establish ways to minimise them, and provide for appropriate actions to be taken if conflicts arise.

3.2.11 Channel management

Finally, relationships must be managed. Literature on channel management is ample and covers various techniques and management skills. The research study merely highlights certain aspects relating to the building of successful partnerships and trust, and only covers the most fundamental issues involved. References and tools of relationship marketing, commitment and trust theory can be used to assist in channel management (Morgan & Hunt, 1994), including physical process and logistics. Motivating channel members is an important task for the company to address. Rosenbloom (1999) provides a list of common motivational techniques to be used for this.

An extensive body of literature is available on trust and the development of trust in transactions. A good starting point is a study conducted by Doney & Cannon (1997) which reviews empirical research on inter-organisational trust. Kozak & Cohen (1997) suggest a list of statements that companies may use to achieve a level of trust and commitment with suppliers. This list was subsequently adapted for distributors taking part in the research study. According to Anderson & Weitz (1992), a channel member's trust in another increases as –

- the other member's reputation increases in its dealings with channel members;
- the member offers more in the way of sales support;
- the member and channel member's goals become more congruent;
- the cultural similarity between the members' channels becomes greater;
- the relationship becomes more long standing;
- the communication level in the relationship increases; and
- the power in the relationship becomes more balanced.

Gattorna & Walters (1996) believe that companies need to continue researching consumer satisfaction in the monitoring stage. The frequency of such research relates to the time it will take to utilise and implement the findings.

The distribution channels' planning/evaluation process must be performed regularly to ensure competitive advantages. The first time the process is performed will be time-consuming and costly, especially for a company starting from zero. However, once the process has been completed, the next evaluates will be easier as the data will be more organised and more readily available, and the planning process more familiar to the company. Not all companies will find it necessary to complete all the steps presented here, as certain channels will not be available (e.g. retailers). For a company that has several products on offer, the analysis will be more difficult, but extremely important as effective distribution channels will give it the competitive edge.

3.3 DATA COLLECTION

Given the perceived loss in market share it is critical for the potato industry to develop a strategic marketing channel management programme which considers aspects such as the nature of the supply chain, as well as value-add for farmers.

The following tasks were performed for the channel marketing strategy. Firstly, target groups were identified; secondly, the product flow throughout the chain was determined and perceptions were gathered; and finally, the supply chain was evaluated. The study was undertaken in close cooperation with Potatoes SA (PSA), a key player in the South African potato industry, while the researcher provided the overall framework. The PSA's good standing in the industry was used to obtain reliable information and ensure cooperation from the sector.

The Delphi technique was used to garner information and perceptions from participants in order to facilitate problem-solving, planning, and decision-making. By using this technique it was possible to draw up a list of major problems and their contributory factors facing the potato sector and to prioritise them according to their relative importance.

Data sources included secondary and primary data. Detailed interviews were conducted with the various role players, while information was obtained through the related questionnaire. Secondary data was garnered from the PSA and other cooperatives, research institutions, promotion centres, urban wholesale markets, business associations and private enterprises. Primary data was collected through field research by setting up detailed interviews with exporters, processors, producers, wholesalers and retailers dealing with fresh, frozen and processed potatoes. Chambers (1983) provides the framework for the detailed interviews, including a participatory method with mapping techniques, diagramming, as well as expert and focus group discussions. Regrettably, there was a general shortage of data on processors and their respective cost structures. Given the competitive nature of the industry, all data collected for the research study, including that obtained from private companies, are treated as strictly confidential, and quoted with great circumspection and sensitivity.

The desired outcomes of the questionnaire, the number of questions to be included, and the concern not to exhaust the goodwill of the respondents were factors considered in selecting criteria for the qualitative survey. The selected criteria covered economic, environmental and social aspects relating to the supply chain. Initially, the selection of criteria (to determine participants' attitudes to the sustainability of their potato business concerns over the past decade) was based on previous studies, and particularly on in-depth interviews carried out with selected representatives of players in the supply chain. However, the initial set of criteria was refined after further discussions with participants in the supply chain. The questionnaire for the qualitative survey subsequently covers a number of general questions which vary slightly according to each stage of the supply chain, and are conceptually split into nine groups. The said groups deal with factors affecting respondents' decision-making about their potato businesses. Factors include respondents' attitudes to the importance of sustainability criteria in their decision management (e.g. profitability, environmental pollution and business uncertainty), other people or organisations that influence respondents (e.g. government and retailers), and factors preventing improvement of performance (e.g. lack of labour skills, adequate natural resources (irrigation, soil and uncertainty)).

A study conducted by Doyer (PSA 2001) on potato production in the Sandveld area of the Western Cape raised a number of concerns, i.e. that producers did not produce to the required specifications of the market and that cost of production rose faster than the potato price, resulting in a cost-squeeze effect. The research study also indicated that there was a trend away from spot (open) markets to contracts, which left spot markets with a lower grade of potato (i.e. prices were set on the spot market and then applied to a lower standard/grade of potato because contracts took up the best quality potatoes). Certain producers were of the opinion that the intervals between grades were too large. Moreover, there was concern over aspects such as overproduction, which reduced the bargaining power of producers.

3.4 SUMMARY

Chapter 3 covers the framework used to assess the fresh potato supply chain and the questionnaire developed to assist with the interviews. The concept framework is based on the model provided by Stern et al (1996). The goals of the in-depth interviews and the quantitative and qualitative part of the framework are also presented here. Moreover, an overview of the application of the developed framework to the fresh potato supply chain is provided. The next chapter deals with the findings of the in-depth interviews, while the South African potato supply chain is also described in greater detail.

CHAPTER 4

DESCRIPTION OF THE SOUTH AFRICAN POTATO SUPPLY CHAIN

4.1 INTRODUCTION

This chapter considers the different marketing channels within the South African potato industry. The quantification of the channels was determined by investigating the volume and value of the product handled by each role player in the chain. By using the available data a functional analysis graph could be drawn to describe the roles of the various players and the customers served by them.

The chapter also seeks to determine the market share of each role player in the channel. The main focus is on retailing, exporting and processing channels.

Microsoft Office Excel software was used to record potato chain information on computer. The data was collected in the 2003/2004 season.

Flow diagrams
Basic data

4.2 POTATO FLOW CHARTS

For the purposes of the study, the South African potato supply chain is represented by means of a set of flow diagrams. The flow diagrams provide the functional analyses of the various agents participating in the chain, followed by their descriptions. The chain is divided into two main stages, first table potatoes, produced for final consumption, and second seed potatoes, produced to be used in the production channel again. The data used was collected in 2002. Chapter 4 also covers the processes followed by the various agents and role players in the chain.

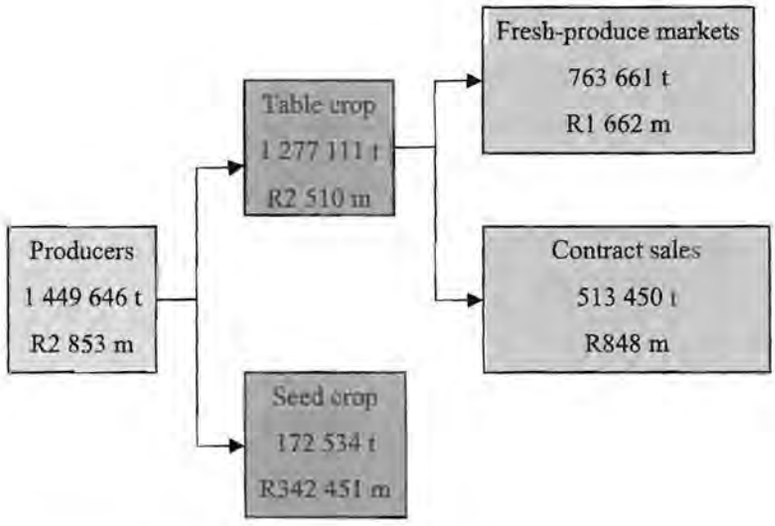

Figure 4.1: Potato chain main stages

Stakeholders covered in the first stage are responsible for the production of seed to be used in future for planting new potatoes. The seed is measured in terms of a Generation (G) count. A G-count of 1 (one) refers to the first generation of seed, which means the seed is near to pure, with a low probability of virus infections. A G-count of, say, 6 refers to the sixth generation of seed. Seed producers use two agents:

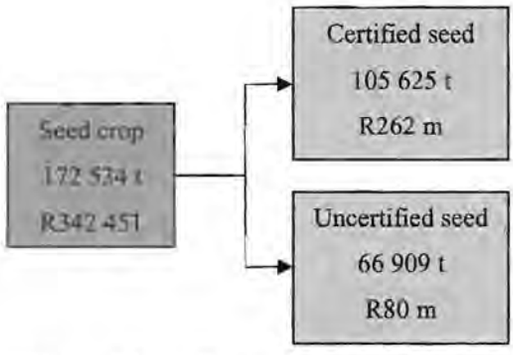

Figure 4.2: Potato chain seed production

The second production stage includes the majority of potato producers, i.e. the actual on-farm production of table potatoes (Figure 4.3).

Figure 4.3: Potato chain table potato productions

The third stage, i.e. the raw commodity stage, represents the stage after the potatoes leave the farm. Potatoes then move into various directions down the chain. The route followed is largely determined by the cultivar and the quality of the product. During stage three, table potatoes move through two systems, i.e. market sales and contract sales. For market sales, potatoes are considered to be sold on the various national fresh-produce markets (FPMs). Contract sales are based on the contract between a producer and a buyer. In this case potatoes do not flow through a fresh-produce market, but direct from producer to buyer, including direct at the farm gate to traders.

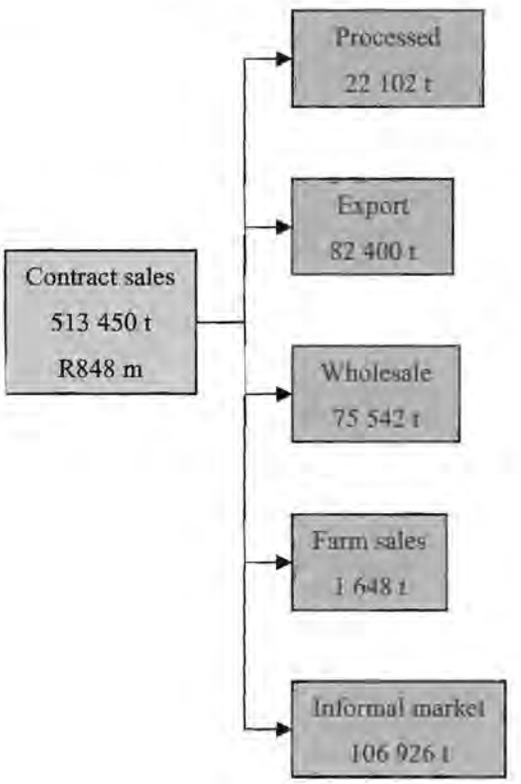

Figure 4.4: Potato chain raw commodity non-markets

The next paragraph provides a brief explanation of each of the role players listed in Figure 4.4 above (for the 2003 season).

Processors purchase potatoes as a raw product with the intent to add value by changing the product form, e.g. sliced potatoes are used as chips for frying. Processors bought 22 102 tons of potatoes through contract sales, while 52 500 tons of their raw product were purchased on the FPMs. The processors involved were companies such as McCain Foods, Simba and I&J.

The potato export sector consists of smaller private companies which export potatoes to the rest of Africa. During the 2003 season, the sector bought 82 400 tons of potatoes through contract sales, while 38 000 tons of their raw product were purchased on the FPMs.

Wholesalers purchase mostly fresh potatoes for chain stores that buy direct from them, or for other retail sites such as restaurants. The various wholesalers bought 75 542 tons through contract sales, while 395 161 tons of their raw product were purchased on the FPMs. Those involved were companies such as Freshmark, Freshline and UP to Date.

Farm sales comprise sales from the farm to the local community in the area. For the period under review, only small quantities, i.e. 1 648 tons of potatoes, were used on farms.

Informal markets are considered to be markets in the rural areas and in the cities that experience a lot of movement by the lower LSM groups (i.e. referring to the South African Advertising Research Foundation's Living Standard Measure (LSM)). These markets bought 106 926 tons of potatoes through contract sales, while 278 000 tons of their raw products were purchased on the FPMs.

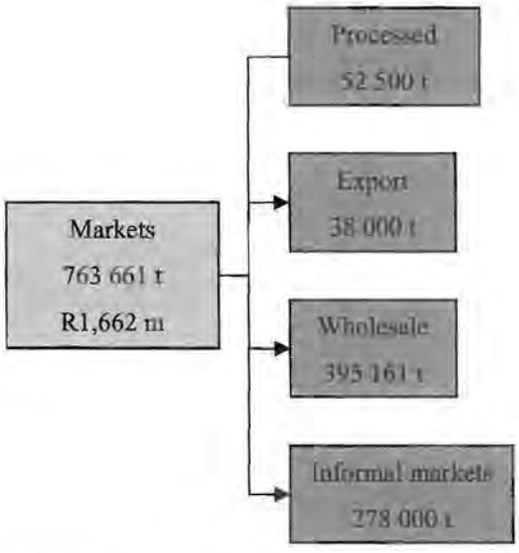

Figure 4.5: Potato chain raw commodity market

The next processing stage is represented by the part of the industry where the most value can be added. Collecting information in this part of the chain presented a considerable challenge since participants were reluctant to provide information; evidently because of competitiveness in the industry. Producers of processed foods are generally cultivar- and quality-specific. They rely on producer contracts with suppliers to achieve a constant supply throughout the year. Five agents are involved in this stage:

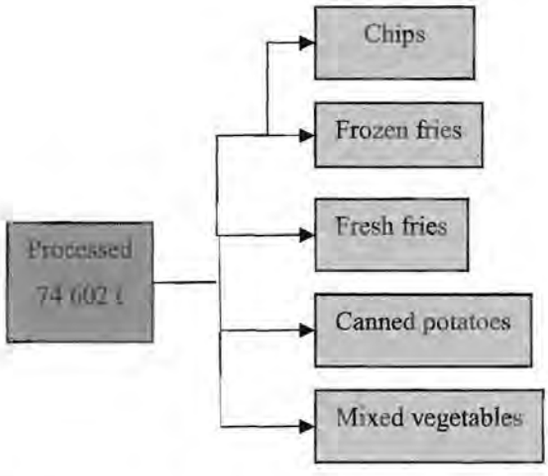

Figure 4.6: Potato chain processor leg

The processed-commodity stage presents the first opportunity where processed products come into contact with consumers. This is largely an agent-based stage which may be regarded as a link between processors and consumers. Three agents are involved:

- French-fries retailers
- Chips retailers
- Exporters.

The final consumption stage is considered to be self-explanatory, where the product is consumed or re-invested into the chain, and comprises four out-of-chain agents:

- Seed potato production/sellers
- Table potato home consumers
- Chips and French-fries consumption
- Table potato exports.

The last two stages are discussed in more detail in the next chapter.

4.3 POTATO PRODUCTION IN SOUTH AFRICA

The research study (as with any primary data-based analysis) relied heavily on the basic data provided. Much time and effort went into collecting data which, as noted before, was not readily available, and subsequently presented a considerable challenge. The following section provides some insight into the structure of the cost analysis and serves as background to the South African potato production chain.

Potatoes are produced in all nine provinces of South Africa. For the purpose of covering the entire SA potato industry, the country was subsequently divided into 14 production areas. Figure 4.7 indicates each area individually.

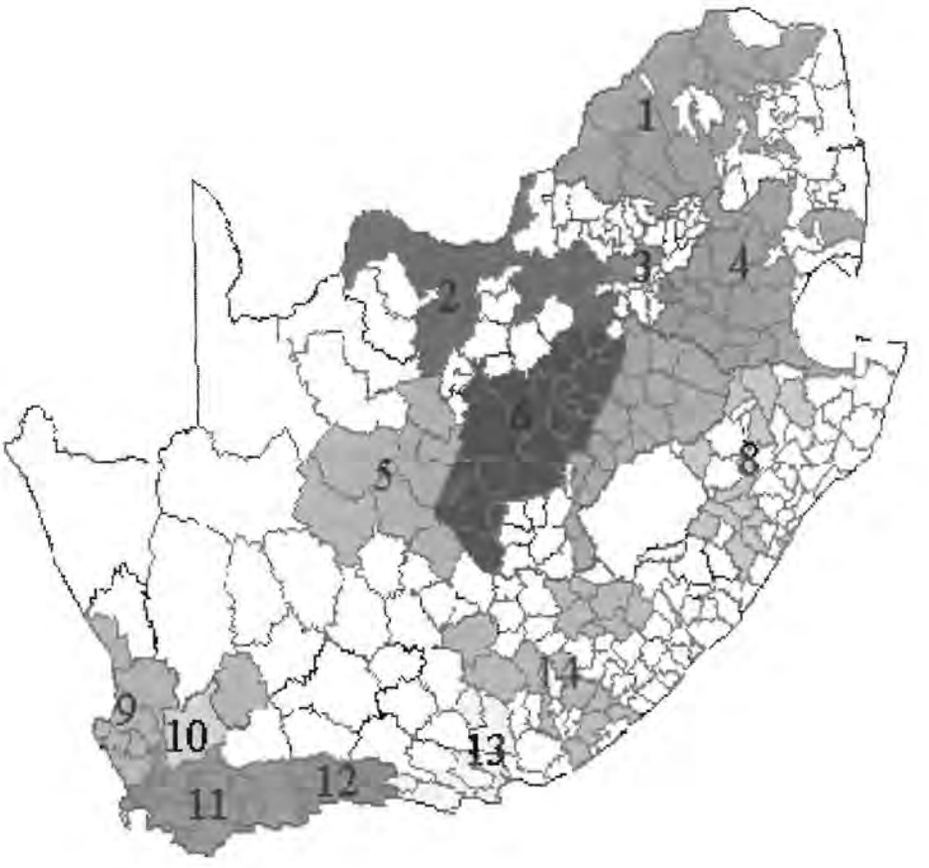

Figure 4.7: Potato production areas in South Africa

Table 4.1 sets out the location of the respective production areas per constitutional province for the period under review.

Table 4.1: Location of production areas per province

	PROVINCE		PRODUCTION AREA
1	Limpopo	1	Limpopo
2	North West	2	North West
3	Gauteng	3	Gauteng
4	Mpumalanga	4	Mpumalanga
5	Northern Cape	5	Northern Cape
6	Free State	6	Western Free State
		7	Eastern Free State
7	KwaZulu/Natal	8	KwaZulu/Natal

	PROVINCE		PRODUCTION AREA
8	Western Cape	9	Sandveld
		10	Ceres
		11	South-western Cape
		12	Southern Cape
9	Eastern Cape	13	Eastern Cape
		14	Northern Cape

Since 1965, potato production volumes have increased by 5,3% every year. The number of hectares planted with potatoes has also manifested an upward trend since 1965, peaking in 1989 at 71 606 ha, and then declining again to 53 872 ha in 1998. However, in 1999 plantings began to increase again (56 680 ha) (PSA 2002).

The six role players referred to earlier in this chapter are now discussed in greater detail.

4.3.1 Potato seed producers

According to a PSA report, of the approximately 2 000 potato producers in South Africa only about 300 were registered as seed growers in 2002. To be able to grow certified seed potatoes, a potato producer is obliged to register in terms of the potato certification scheme. If the seed potatoes produced meet the requirements of the scheme, they are certified and the producer could sell the material as seed to other producers. The industry also differentiates between two types of seed, i.e. certified and uncertified. Farmers tend to produce their own seed (uncertified seed) because of the rising cost of seed. The next two tables cover the cost structure of certified and uncertified seed for the period under review. The price of the raw product is fixed at R1 800 per ton and is included in the last line of each table:

Table 4.2: Uncertified potato seed cost per 10kg bag

Activity	R
Transport	5.00
Sort & Pack	0.00
Containers	8.00
Rent	6.00
Wages	11.00
Taxes & Fees	0.00
Interest	0.00
Cost excluding raw product	R 30.00
Per each 10kg bag	R 48.00

Table 4.3: Certified potato seed cost per 10kg bag

Activity	R
Transport	15.00
Sort & Pack	0.00
Containers	8.00
Rent	6.00
Wages	11.00
Taxes & Fees	30.00
Interest	0.00
Cost excluding raw product	R 70.00
Per each 10kg bag	R 88.00

4.3.2 Table potato producers

While quality plays an important role in product differentiation, price formation and price differentiation, it also presents a handy tool to develop markets further. The effect of greater differentiation through quality is that buyers at the 'bottom' end of the market are prepared to pay a somewhat higher price than a few years ago, because the product is considered to be a bargain as compared to much higher prices for high-quality products. Greater price differentiation on the basis of quality ensures that more produce (or the same at better prices) are sold than before. Quality management is therefore essential to ensure that 'quality' plays an optimal role in terms of differentiation.

As potatoes are produced throughout the year, the input/output data of both summer and winter producers are considered – based on the production input costs of producing one hectare of table potatoes. Table 4.5 covers the cost breakdown of producers for the period under review. The response of producers to the questionnaire is summarised in the next table.

Table 4.4: Questionnaire response: Farmers/Fresh-Produce Markets

Commodity characteristics	Over supply of potatoes
	Too much carry-over stock on FPM
Consumption patterns	Growth in informal trade and large buyers
	LSM Group-specific buying patterns
Supply situation	If the price was high, the farmer did not supply to direct contract but to the FPM, and vice versa.
	No market for low quality
Price relationship and seasonality	Overlapping seasons created problems in supply and forced prices down
Food system participants and organisations	Direct sales grew at the cost of the market
	Supply had to be controlled
	No unity on the market
Sub-sector and food system operations or behaviour	Retailers, processors and wholesalers moved away from markets to direct contracting
Marketing system infrastructure	Theft was a problem on the FPM
	Buyers were not happy with the FPM

Farmers reported that producers with large potato enterprises (more than 50 annual potato cultivation areas) preferred to sell almost their entire crop to wholesale processors, while farmers with small potato enterprises were usually the ones who supplied to open markets and the informal trade. The number of merchants was also steadily decreasing, thus farmers felt that the remaining merchants had more negotiating power compared to farmers. In general, farmers seemed to be unhappy

about their poor negotiating power and wanted to add more value to the product on the farm.

Farmers stressed that until 10 years before they had sustained financial losses from potato enterprises only in certain years, because three to four out of 20 profits were very high. For the period under review, farmers perceived that they needed stable, though moderate, positive financial outcomes every single year to stay in business.

Farmers mentioned that they had to produce record crops for contract processors and growers or those parties would not buy their crops again. The type and quantity of pesticides used by farmers were defined by farm protocols, which were usually adequate to protect crops against disease. Farmers were also of the opinion that environmental issues had been of greater importance in their decision making, water management had improved, and more prudent use had been made of fertilizers and pesticides than in the past. The next table indicates the cost structure of a producer of table potatoes.

Table 4.5: Production cost of table potatoes

Activity	
	R
Small Machinery	20.00
Machinery	80.00
Seeds	500.00
Manure	8.00
Fertilizer	10.00
Insecticide	14.00
Pesticide & Plant Disease	13.00
Rent/Land/Other	600.00
Labour	150.00
Per each ton of output	1375.00

4.3.3 Table potato wholesalers

Wholesaler interviews initially dealt with the main characteristics of procuring, packing and marketing fresh potatoes, as well as major changes in the fresh potato supply chain during the past 10 to 15 years. Wholesalers reported that significant changes had taken place in the fresh potato supply chain over the past 10 to 15 years. The number of growers and merchants had fallen dramatically, while major retailers sold the largest share of fresh potato volumes. Thus, the larger merchants had moved almost their entire trade to major retailers from the market. In the past, farmers produced potatoes which they thought the market wanted and then tried to sell them on the market. It was found that farmers grew mainly potatoes that were specified by wholesalers and major retailers.

The response of wholesalers to the questionnaire is summarised in the next table:

Table 4.6: Questionnaire response: Wholesalers

Commodity characteristics	Difficult to pack on farm because the product quality could vary
	Products were repacked into other sizes
	They went to the farmer
Consumption patterns	Bulk buys were direct, smaller buys came from the market
	Retail shift to pre-pack
Supply situation	'You don't know what you are buying when you buy on the FPM.'
	Over supply of potatoes
	Told farmers when and how much to deliver
Price relationship and seasonality	Used FPM as measure of price indication for contracts
Food system participants and organisations	Limited cooperation from farmers. They harvested if the price was good and not if there was a demand.
Sub-sector and food system operations or behaviour	They delivered a better and more varied service than the FPM.
Marketing system infrastructure	Believed in in-store promotions
	Were willing to participate in in-store promotions
Government marketing institutions, policies	They had met all the regulations and were up to standard.

In the past wholesalers bought fresh potatoes for packing from the market. Wholesalers said they had established links with a limited number of farmers with large enterprises who produced potatoes that met retailers' requirements, and they were subsequently able to achieve economies of scale (cost reduction). Wholesalers had annual procurement programmes for supplying their customers and were able to make recommendations to farmers about the cultivation area, varieties, and the time potatoes had to be delivered to them.

Wholesalers mentioned that major retailers made different demands in terms of product specifications. Some required up to 20 different lines according to the package, variety, price and purpose of usage. Retailers also required exclusivity in terms of product differences in order to achieve competitive advantage. Wholesalers stressed that those differences meant additional costs for wholesalers because of the allocation of a special requirement to every retailer.

With respect to the factors that were important in wholesalers' decision making, respondents mentioned that all major retailers encouraged wholesalers to consider the environment in all their activities, as well as in the activities of farmers. Traceability was perceived by wholesalers to be very important to all major retailers. Major retailers required wholesalers to adopt a registration process to monitor their performance and compliance in terms of certain standards, either by a third-party audit or internal audit. Moreover, wholesalers said they had to monitor the potato crop 'on behalf' of retailers in order to determine if the crop met the standards of retailers.

In this study the unit cost per ton of output was set for each individual agent. Wholesalers and markets were combined, as the cost incurred was very similar. The costs were determined as follow:

Table 4.7: Trader/Wholesaler cost

	Wholesalers	Retailers	Exporters
Activity			
	R	R	R
Transport	40.00	40.00	240.00
Sort & Pack	12.60	15.00	100.00
Containers	15.00	8.00	40.00
Rent	10.00	20.00	100.00
Wages	5.00	10.00	20.00
Taxes	54.00	10.00	15.00
Interest & Other	0.00	0.00	80.00
Cost of production excl potato	136.60	103.00	595.00
Per each ton of output	1936.60	2263.00	2755.00

4.3.4 Processors and agents

In most cases processors expressed definite preferences for certain cultivars and qualities of potatoes. For that reason, processors transacted contractually with producers to ensure that they obtained supplies at certain prices. Although processors seldom contracted for their full requirements, they kept their options open to purchase certain supplies through fresh-produce markets and/or direct from the producer on a non-contractual basis.

In direct transactions, prices are determined through private negotiations between producers – and/or producer co-ops – and buyers. From a price determination point of view, the market can, in the case of a limited number of sellers, experience a limited number of buyers, where the business and circularity of concurrence in such a market situation means that prices will differ in each transaction, depending on how the relevant parties respond to each other's market behaviour. Although the personal element plays an important role, the strength of the individual market party's negotiating position is of critical importance in determining prices.

The retailer representative stressed that his business required a supply base capable of providing a range of products for the entire year to satisfy customer needs. A whole range of potatoes was available that included many varieties and different uses. The respondent also stressed that 10 to 15 years before, customers had no loyalty to processors. However, as the business volumes of major processors increased, it became evident that a loyal and stable supply base was necessary to meet growing market demands. In fact, processors had to reduce costs, understand the cost structure, plan the required volumes in advance, and improve the efficiency of the supply chain. The retailers' views are summarised in Table 4.7.

Table 4.8: Questionnaire response: Retail

Commodity characteristics	Better quality potatoes than the FPM
	Needed barcodes on bags
	Consumers wanted the use and cultivar of potatoes on the bag
Consumption patterns	Impulsive buying was very important
	Considered the buying pattern of the FPM and who was buying
Supply situation	Independent stores were falling away
	Over supply
	Farmers needed to comply with regulations
Price relationship and seasonality	Used FPM as measure of price indication for contracts and the rest of the chain
	If the price rose, they sold more
	Did price checks against competitors
Food system participants and organisations	The future of the FPM was uncertain
	The FPM was a dumping ground for lower quality
	'What was the knowledge of the market agents about potatoes? '
Sub-sector and food system operations or behaviour	Agents on FPMs protected each other and prices would differ only by a maximum of 10 cents.
Marketing system infrastructure	Believed in in-store promotions (All)
	Were willing to participate in in-store promotions (All)
Government marketing institutions, policies	Worked with Eurogap standards and did not compromise on safety (All)

The respondent said that his organisation's supply base for potatoes had been reduced and had lately included only 10 to 12 producers in a region. They had worked with those producers for a long time and there was a good understanding of each other's objectives. The processor delivered products which met consumer standards.

The respondent said that his company continuously conducted customer research about the stores, the range of products, and product quality. The particular process enabled marketing groups to offer to consumers the products they would like to be offered. The processor representative also mentioned that the media had a considerable influence on those involved in the supply chain because of their impact on consumers.

The costs of processors were divided into two sections as indicated in the next table:

Table 4.9: Processor cost

	Potato Chips	French Fries
Activity		
	R	R
Transport	3,000.00	145.00
Sort & Pack	1,800.00	234.00
Containers	0.00	0.00
Oil	2,000.00	230.00
Power & Electricity	550.00	130.00
Flavour	1,000.00	0.00
Labour	1,300.00	850.00
Overheads	1,000.00	600.00
Interest	60.00	20.00
Depreciation	600.00	156.00
Cost of production excl potato	11,310.00	2,365.00
Per ton of output	18,510.00	5,965.00

4.3.5 Output prices

The output prices are the prices paid on the open market. It is assumed that the willing buyer, willing seller principle applies.

The rising trend in the percentage of 'medium' potatoes and the downward trend in the percentage of 'small' potatoes is a direct result of sub-division. Potatoes with a mass of 85 to 100 g, which before were marketed as Small, are marketed as Small Medium. Although the difference in the case of Large would probably not be significant, a similar assumption could explain the downward trend in the Large size.

The demand for potatoes in a specific size group as a result of specific consumer preferences would inevitably result in a difference in demand for specific size groups among FPMs. At the same time, production conditions in a specific production area could also influence the supply of a certain size group at a particular FPM.

According to Goodhue (2000), at the time of negotiation neither the seller nor the buyer has factual information about the quantity and quality of the products offered and/or demanded on the market for a particular stage. In practice, both sellers and buyers rely to a large extent on their knowledge and experience, limited information obtained through observation, and evaluation of the supply and demand situation, to negotiate a price.

Potatoes are regarded in economic terms as a low-income elasticity product. This is largely due to the fact that potatoes are compared to maize and other commodity products. Consumers who earn a higher income would rather spend the additional income on protein products (e.g. meat) than on similar basic products (e.g. potatoes). The opposite, of course, is also true.

This also explains the traditionally inelastic nature of the demand for potatoes. The production of potatoes is variable and therefore determines the elastic nature of supply. For this reason it may be argued that the elasticity of the price of potatoes is a direct derivative of the supply (production) of potatoes in South Africa. However, factors that were found to play an important role in determining the potential demand for potatoes include:

- The previous day's prices
- Prices and quantities on other markets
- The number of buyers
- Enquiries from buyers
- Quantities requested
- Quantities sold the previous day
- The type of buyer
- The day of the week

- Whether a buyer was a regular buyer.

Having considered the demand factors in the price determination process, it became evident that an objective measurement process was used only in a minority of cases for measuring these factors. The subjective perception and judgement of a sales person based on his or her own experience played a decisive role in evaluating such factors. Various sales persons indicated that they relied to a large extent on their intuition or gut feeling.

Aspects important in determining the potential supply of a product include:

- Quantities on market floor
- Quantities on markets
- Expected deliveries
- Prices and quantities on other markets
- Quality of products
- The day of the week
- Availability in production area
- Personal liaison with producers.

Subjective criteria, based on experience and intuition, were used to judge the supply factors' relevancy and impact. Therefore, gut feeling again played a major role.

The quantity sold and the fact that buyers purchased regularly from a particular market agent were the most important arguments used by buyers to negotiate lower prices with market agents. A good quality product, a well-known brand, and special packaging also placed the market agent in a favourable position to negotiate a good price for the producer's product.

Output prices were collected for each of the following:

- Potato seed producers – potato seed
- Table potato producers – potato producers

- Table potato traders – wholesalers, retailers and exporters
- Processors – chips plants and French-fries plants
- Processed traders – chips and French-fries retailers.

Table 4.10: Output prices for 2004

Agents		Price (R/ton)
Potato Seed	Potato Seed	2,500.00
Table Potato Producers	Potato Producers	1,800.00
Table Potato Traders	Wholesalers/Market	2,160.00
	Retailers	2,592.00
	Exporters	4,500.00
Processors	French fries: Plant	10,000.00
	Chips: Plant	32,000.00
Trader/Retailer	French fries: Retailers	14,000.00
	Chips: Retailers	48,000.00
	Exporters: French fries	17,000.00

The above table indicates the increase in value-adding cost. The price of the product increases exponentially as it moves down the value chain.

4.4 ENVIRONMENTAL OVERVIEW

According to Kotler (2003), marketing (the four Ps) and the variables that influence it are critical elements in satisfying consumer needs. Kotler (2003) also believes there are external environmental factors that invariably influence the total marketing environment. Clearly, the potato industry cannot exist without consumers. One of the important key success factors is to identify new consumers and retain existing ones. This is possible because consumers are attracted to a product by offers that meet their perceptions of the product. The marketing task is to define what the consumer regards as a good offer and to ensure that the consumer is satisfied with that. Consumer satisfaction requires a total integration of all activities in the potato industry. Although the environmental analysis is not the main focus of the study it will be given some attention.

Factors considered to have no influence, e.g. political, environmental, economic and agricultural conditions, including the physical environment (resources and organisational objectives), and the international environment, nevertheless have to be borne in mind in planning the strategy, but with the assumption that they represent a set of given factors.

According to Kotler (2003), there are various environments that require attention. In an attempt to improve understanding of consumer trends and needs, and in an effort to probe the reasons behind changing meal trends and potato attitudes, the National Eating Trends (NET) food consumption diaries were considered and discussed in the interviews. The study also involved analysing lifestyle issues and consulting Census data.

4.4.1 Economic environment

The possible impacts of the economic environment include: income changes, education/professional level, employment, exchange rates, interest rates, economic integration, supplier concentration, buyer concentration, business life cycles, GNP trends, capital and financial availability, inflation, energy availability, natural environment input constraints (water, air), tourism expenditure, and others.

Potatoes are regarded as the most important vegetable product in South Africa. The total production for 2003 was 1 556 225 tons produced on 49 305 ha of land. Potatoes contribute about 2% of the gross value of all agricultural products produced, but use only about 0,03% of workable agricultural land, making potato production one of the most effective production systems in terms of South African rand per hectare. As South Africa exports about 1% of the world exports (according to the Southern African Customs Union (SACU)), the country cannot be regarded as a large exporter of potatoes. South Africa produces approximately 1 556 225 tons of potatoes annually. Potatoes are produced throughout the year because of the different climatic conditions in the various planting regions.

Furthermore, potato purchases are price inelastic, and purchases are highly planned, reducing the need for deep discounts. Since potato consumers shop mostly by type,

and higher-end customers are knowledgeable about new items being introduced, reasonable price gaps between the segmented tiers reinforce value perception among the segments.

Most buyers in the supply chain buy potatoes in bulk, and aspects such as credit and debt affect them substantially. These factors also influence the chain and, subsequently, marketing within the chain. Factors such as interest rate hikes, rising transport costs and fluctuations in the exchange rate need to be closely monitored to determine how they affect the flow of products in the chain. Another issue of special import is sustainable development and the sustainable use of resources. Although consumers have become aware of issues such as food safety, that happened at the expense of producers and role players in the chain. One problem constantly facing the agricultural industry is drought (or water shortages), which could eventually bring the entire potato chain to its knees. The other challenge is minimum labour wages introduced in South Africa, which has a considerably effect on the price of agricultural produce and inputs. More research is required to determine how and if these fluctuations will be absorbed by the chain or if they will merely be passed on to the consumer.

4.4.2 Consumer expenditure on rival carbohydrate products

According to the PSA (2002), maize and wheat made up 49% of the total grain production in South Africa. The consumption of grain products per product for the period under review appears in Table 4.11. According to estimates, approximately 2% of all maize products are exported.

Table 4.11: Household expenditure

Product	R 000	%
Cake flour	1 534 728	7,4
Bread flour	1 484 366	7,1
Maize flour	4 891 071	23,5
Moat	191 664	0,9
Other	160 103	0,8
Cereals and other prepared products	1 000 181	4,8
Rice	2 312 899	11,1
Maize rice	845 442	4,1
Pasta	641 104	3,1
White bread	3 363 319	16,2
Brown or whole-wheat bread	2 910 311	14,0
Buns	296 865	1,4
'Rusks' and biscuits	591 887	2,8
Baby food	430 413	2,1
Other grain products	137 119	0,7
TOTAL	**20 800 472**	**100,0**

Source: PSA (2002)

Of the total 2,3 billion loaves of bread produced annually, 76% are consumed by consumers in the traditional black residential areas, while 79% of all brown bread are sold to the black consumer group. Bread alone makes up 30% of total expenditure on grain products.

4.4.3 Consumer expenditure on fresh fruit and vegetables

During discussions with interviewees it became evident that potatoes were still regarded as a vegetable and not as a staple food. Vegetables make up 11% of total household expenditure on food. That is indicative of how important these products are to the diet of South Africans. Fruit occupies a 4% share in this. The reasons for the

low percentage are mainly due to the availability and affordability of fruit to lower- and medium-income groups. Potatoes are the most popular type of vegetable, followed by tomatoes. The next table covers household expenditure on fruit and vegetable products.

Table 4.12: Vegetable production 2002

Production	**R 000**	**%**
Fresh vegetables		
Potatoes	2 249 151	22,4
Tomatoes	1 409 050	14
Onion	1 060 087	10,5
Cabbage	1 001 513	10
Pumpkins	559 670	5,6
Carrots	460 628	4,6
Beetroot	334 980	3,3
Green beans	334 989	3,3
Sweet potatoes	251 933	2,5
Garlic	209 399	2,1
Lettuce	201 877	2
Green maize	139 862	1,4
Other	188 237	1,9
Total fresh vegetables	***8 401 376***	***83,6***
Processed vegetables		
Frozen vegetables	796 946	7,9
Canned vegetables	397 258	4
Dry vegetables	322 441	3,2
Other	132 902	1,3
Total processed vegetables	***1 649 547***	***16,4***
TOTAL	**10 050 923**	**100**

Source: PSA (2002)

According to Table 4.12, South Africans favour potatoes as a vegetable. However, during the work sessions with respondents it was suggested that consumers needed to make a mind shift from potatoes as a vegetable, to potatoes as a source of staple food.

4.4.4 Technological environment

The possible impacts of the technological environment: new technological solutions, mail sales, phone sales, internet sales, scanners, computerised stock, just-in-time deliveries, EDI (electronic data interchange), POS data (point-of-sales data), electronic funds transfer, automated ordering, technological transfer, ECR (efficient consumer response), cellular phones, and others.

Potato production in South Africa is a high-yield and high-risk enterprise with good income potential for producers, yet the product is affordable to most people. The most significant changes in the production patterns of potatoes may be implemented through irrigation technology and a major shift from dry land production to irrigation production. During the interviews farmers indicated that high production costs were forcing them to introduce irrigation technology in order to manage high risk and price fluctuation characteristics of dry land potato production. The shift towards irrigation production methods is expected to continue. The result of this trend is more stable production, coupled with higher yields and earnings. One of the risks of dry land production is the over production in good years with market prices below cost, and vice versa. The resultant fluctuations in quality and prices place a heavy burden on infrastructure at fresh-produce markets and impact negatively on consumer preferences (Jordaan & Van Schalkwyk, 2002).

Technological advances in terms of new cultivars, better cultivation and irrigation practices, and an increase in the use of certified seed potatoes, result in increases in production. Research concerning cultivation practices and the combating of pests and diseases is continuing in the potato industry. As products become more advanced, the public has to be assured of issues regarding food safety. More information has to be made available on aspects such as GM potatoes and their benefits and drawbacks. The various role players in the market need to be verified, and they must be consulted

about various marketing strategies. Competitors in and outside the chain must be identified, while SWOT (strengths, weaknesses, opportunities, and threats) analyses need to be performed to evaluate their position in the chain.

4.4.5 Socio-cultural environment

The possible impacts of the socio-cultural environment: those concern gender, age, race and age, time scarcity, individuality, security, convenience, leisure, social mobility, income distribution, attitudes to work, lifestyle changes, family sizes, and others.

Based on consumer and retail research (see previous section), the research team became convinced that the key to potato category development was a consumer-based category segmentation strategy. The questionnaires indicated that the team first had to determine why people 'were buying' or 'would buy' potatoes. Then they had to determine the right mix of products to satisfy shoppers in new category segments. Discussions also revealed that consumer needs was not the primary driver in the potato category. The following key learnings need to be considered when developing a new consumer-based segmentation strategy:

- The majority of consumers purchase by type/variety
- Most potato purchases are pre-planned
- Price is *not* the number 1 attribute – appearance and quality are
- Consumers want smaller bag options with the same quality as bulk
- Consumers want and need more information – type/variety and usage suggestions.

The potato category segmentation strategy was developed in accordance with inputs from retailers and informal traders, and most importantly, from the responses of fresh-produce market agents to questions about consumer wants and needs in the potato category.

The segmentation strategy addresses a range of considerations specific to the unique characteristics of the fresh potato category. Consumers are less sensitive to potato

pricing than they are to type and quality. A tiered pricing strategy is expected to address the right value proposition to the right shopper. As supply varies by region, each segment is defined with enough scope to satisfy a particular type of potato consumer. Bargain bags are an important strategy used mainly by informal traders, i.e. they keep the price constant, but increase or reduce the number of potatoes per bag.

The integrity of segmentation has to be maintained. However, it also became evident that tactical execution would have to be adjusted to meet the unique characteristics of a particular chain. A chain could maintain the spirit of the segmentation strategy and still offer different mixes of products that were right for specific market conditions. Maintaining price gaps between segments would clearly communicate to consumers the different values between the offerings in each segment. That would subsequently ensure pricing consistent with the chain's competitive strategy.

Consumers would eat potatoes more frequently if they felt they were convenient and could easily be part of quick, casual meals. Providing best-use preparation tips, menu ideas and consistent quality in packaging builds customer loyalty. Smaller households prefer smaller bags of a consistent size and excellent quality, while larger families and those on fixed incomes prefer larger size bags and economical menus. Pre-cooked potatoes and other convenient products significantly cut preparation time, and all of them provide better quality than before. Although regarded as relatively new products, pre-cut and cooked potato products are also yielding good results, especially when displayed next to meat or in the convenience section.

On the promotional side, a third of retailers promote the category weekly, half of them promote two to three times a month, while the rest do not promote at all. All retailers indicated that they were willing to participate in promotional programmes inside stores. The following questions need to be answered:

- Is it really necessary to promote a category regarded as a heavily planned purchase as often or as deeply, especially if quality is considered to be a more important purchase criterion than price?

- Would off-cycle promotional activities to stimulate sales during historically slow sales periods not yield the same results?

- Should efforts not be re-directed to the informal trade?

As with pricing and promotion, there was general consensus on factors/trends that would impact on the category over the next one to five years. Two thirds felt convenience/value-adding/meal solution products would be required both in the short and long term to support sales. In support of that trend, it was found that 80 per cent of retailers had been offering pre-cut potatoes in their operations. However, there were mixed comments about how and where to merchandise such products, and about their performance. Addressing these trends would be extremely important not only for potatoes, but for many other products and product categories.

The National Chamber of Milling commissioned the Bureau for Economic Research (BER) at Stellenbosch University to undertake an investigation into the impact of HIV/AIDS on the consumption of maize meal and wheat flour in South Africa. The aim was to evaluate the over-capacity experienced during the period under review in the light of estimated consumption patterns of staple foods in South Africa. For that purpose, the study focused on a 5- and 10-year projection and evaluated the situation on a national and regional basis. The study is considered to be of great importance since maize and wheat are direct competitors of potatoes in the food industry.

According to figures published by the Department of Health, the number of South Africans infected with AIDS was 4,7 million (11,6%) in 2001, with an estimated 1 700 new infections every day. Measured according to antenatal prevalence, the number of infected people in South Africa was 24,5%. That was confirmed by the International Monetary Fund World Economic Outlook Report of September 2000.

The impact on the labour force of South Africa has also been calculated by other institutions. Data released by Sanlam/Wefa SA subsequently indicated that the estimated HIV prevalence for 2000 was as follows:

High skills	8,0%
Medium skills	12,5%
Low skills	21,0%

Given the implications (on a macro basis) for the country and Africa as a whole, and for the purpose of evaluating the impact on households, the BER accordingly evaluated the drivers for the sale of maize meal and wheat flour. It was found that for every 1% decrease in disposable income and employment, maize meal sales would decrease by 0,8%, while for every 1% decrease in population growth, maize meal sales would decrease by 1,3%. In terms of the consumption of maize meal, that impacted severely on the tonnages of maize processed in the country. The BER furthermore forecast that for every 1% decrease in disposable income and employment, wheat flour sales would decrease by 0,97%, while for every 1% decrease in population growth, wheat flour sales would decrease by 0,3%. On the one hand it would appear that maize meal sales are much more sensitive to population growth than wheat flour sales. On the other hand, wheat flour sales are much more sensitive to disposable income and employment rates in South Africa. The effect on the per capita consumption of potatoes is not entirely clear. However, the assumption could be made that a decline in consumption was to be expected given the uneducated customer base.

4.4.6 Political/Legal environment

Possible impacts of the political/legal environment: those included market access (protectionism), package recycling laws, antitrust policies, economic integration (commercial blocks), labelling requirements, packaging constraints, types of communication constraints, tariffs barriers, taxation policies, employment law, stability of governments, subsidy policies, product and/or process certification, and others.

The factors of the institutional (legal) environment are applied in distribution contracts (or strategies). An analysis of the specific institutional environment of the country could also be performed to verify whether the most common tactics are feasible for the particular market. It is important to consult specialists (lawyers) for

this particular step and to determine what actions the company would need to take if any of the listed factors materialise.

Approximately 80 per cent of the total table potato production of South Africa is marketed in the urban areas. All potatoes marketed in these areas have to comply with certain minimum standards set by the government in respect of packaging, classing, sorting and marking. These regulations are regularly revised to comply with the needs of consumers and producers. The South African potato industry largely fulfils the potato requirements of various neighbouring countries and sporadically exports potatoes to overseas countries.

Although the PSA contributed much to the measure of stability and governance in the production of potatoes, there was still no control over the cultivation or marketing of potatoes. The PSA continuously endeavours to promote stability in the potato industry with the aid of a sophisticated information service and various schemes such as export, distribution in under-supplied areas, and price support schemes. Without infringing on the freedom of producers or the trade, the PSA has managed to maintain prices at such a level that sufficient potatoes are produced and are made available to the rapidly growing population at reasonable prices. This is achieved through the implementation of the Agricultural Produce Agents Act, 1992 (discussed earlier).

4.5 SUMMARY

Chapter 4 dealt with the findings of in-depth, semi-structured interviews conducted with farmers, wholesalers, retailers and processors. After investigating the South African potato supply chain it became evident that the impact of the chain was mainly directed toward end users. That provided a better understanding of the business end of what Potatoes South Africa could expect regarding negotiations, availability of channels, private labels, and other factors. Channel power, which is particularly significant in this regard, refers to the ability of a channel member to control or influence the marketing strategy of an independent channel member at another level in the channel, possibly making them alter their behaviour, or perform an activity that they would normally not perform. The performance of the potato supply chain in

terms of economic, environmental and social criteria, as well as the attitudes of participants in the supply chain, were considered in the study.

The next chapter discusses the issue of contractual analysis and asset specification.

CHAPTER 5

CONTRACTUAL ANALYSIS AND ASSET SPECIFICATION

5.1 INTRODUCTION

An agricultural production contract is a contract by which a producer (called a 'grower' or 'farmer') agrees to sell or deliver all of a designated crop raised in a manner set forth in the agreement to a contractor (sometimes called a 'processor'), and is paid according to a formula established in the contract. A production contract is usually generic for the agricultural industry and specifies the production inputs to be supplied by the contractor, if any, the quality and quantity of the particular commodity involved, the production practices to be used, and the manner in which compensation is to be paid to the producer. These matters were discussed earlier.

The manner in which producers are paid must be clarified from the start. In many instances production contracts include formulas that base payment on a comparison of the performance of contracted crops to the performance of similar crops. In all instances, formulas have to be evaluated carefully before contracts are signed.

A production contract may also be regarded as a *personal service contract*. Such contracts generally stipulate that producers provide services, rather than commodities, to contractors. In terms of production contracts producers do not typically 'own' any of the commodities that are the subject of these contracts. Instead, they provide services and management facilities to the contractors concerned.

Given the fact that the potato industry relies on assets that cannot be used for other purposes outside the industry, asset specification is included in the research study. Based on the framework described by Mahoney (1992) to specify coordination mechanisms using the three conditions of asset specificity, task programmability and separability, the exchange relationship between potato producers and potato processors (through potato buyers) is characterised by investment in specific assets by both parties, low levels of programmability for both parties, and mixed levels of

separability between the tasks and rewards of both parties. Mahoney's (1992) framework suggests that to achieve optimal and sustainable returns for both parties, the relationship between potato producers and potato processors has to be governed by either long-term contracts, cooperation agreements, or some form of vertical ownership. Under circumstances where high levels of separability are evident, contracts are more relevant, while cooperation agreements and vertical ownership become more relevant where there are low levels of separability.

Williamson (1999) identifies a variety of forms of asset specificity, including physical, human, site, and dedicated brand name asset specificity. When the first transacting relationship in the potato supply chain, i.e. the transaction between potato producers (farmers) and potato buyers, is considered and viewed in terms of asset specificity, it becomes evident that the relationship is characterised by relatively high levels of asset specificity for both parties. Potato producers, as the first party to the transaction, invest in a number of specialised assets to be able to transact with first-stage potato processors, the second party to the transaction. Both producers and processors own specialised assets.

5.2 PRODUCERS' SPECIFIC ASSETS

Potato production is very complex and involved, as compared to products such as maize and wheat. The crop is expensive to produce and the risk of losing it poses a serious threat. This may be the result of pest, disease and climatic conditions. However, stock on land is generally considered a liquid asset which diminishes the stock's degree of asset specificity. The value placed on the asset in the field is generally not as high as general stock, as it takes time to produce a good quality crop. When a farmer decides to plant potatoes, a very specific medium-term investment is made in terms of potato seed, which plays a vital role and is usually one of the most significant expenses in potato production. The risk associated with potato production is higher than for other crops, which discourages many farmers. Crop rotation, which is still regarded as a sophisticated and difficult practice, plays an important part in producing potatoes and other crops, since many factors may affect the crop at various stages of production.

5.2.1 Packing facilities

Potatoes have to be transferred rapidly once removed from the ground. Most large potato farmers maintain their own potato packing and sorting facilities on the farm, mostly for bulk packaging of potatoes into 10kg bags or bins. Such facilities usually consist of a point where potatoes are offloaded into a pan of water, from where they are transferred by means of rollers, and cleaned. The next section in the production line comprises drying. Large-fan dryers blow air over the potatoes so that they are dry when transferred to the sizing machines. Farmers use sizing machines to classify their potatoes according to size and move them out to the sidelines, where labourers pack and weigh them into 10kg bags. The entire process requires a large amount of investment in facility assets, which may be classified as relatively specific assets seldom used for other crops without requiring major adjustments.

Smaller farmers contract the facilities of larger farmers to process their product and to prepare it for the next link in the chain. As farm size increase, so does the degree of complexity of the facilities required to provide a quality product to the client.

5.2.2 Production land

In terms of site specificity, land is regarded as a relatively specific asset in which potato producers could invest to transact with potato buyers. Climatic conditions in South Africa allow for potato production almost the entire year round throughout the country. The suitability of potato production to South Africa may be compared in terms of infrastructure required for producing other vegetables, which is nearly the same. Ground preparation equipment such as ploughs and tractors are used for all vegetable production, although special planters are required for planting potatoes.

Potatoes grow in most types of soil found in South Africa. When producers acquire land for producing potatoes, they are investing in an asset that is generally not specific to the production of potatoes. Although farmland is a highly specific investment for all vegetable producers, such land comes at a price premium that does not allow for the production of other lower-income farming activities.

5.2.3 Specialised human capital

Potato producers also need to invest in 'specialised human capital' in terms of informing or educating themselves about the production and handling of potatoes. To an even greater extent they need to be marketers of their product who are able to make informed decisions about, among other things, the best time to send their crops to the market. The production of quality potatoes is primarily dependent on the genetic quality of the seed used, the environmental conditions, and effective management practices. Managing the production process is an important factor in determining the success of a potato crop. Potato producers first have to invest in themselves, i.e. by acquiring the specialised skills to produce successful potato crops. These skills may be regarded as an investment in specific assets.

5.3 PROCESSORS' SPECIFIC ASSETS

5.3.1 Processing equipment

Producers need to invest in specialised equipment in the form of machinery and/or equipment to enable them to transact with potato buyers. This is mostly the case for processors who hire land from farmers to grow their own produce. The equipment used for processing potatoes is generally the same as that used for vegetables such as onions. However, equipment becomes much more specialised when potatoes are processed for the chips industry, e.g. where oil baths are used for frying, or for the seed industry. As indicated earlier, certain harvesting and on-farm processing equipment can only be used for producing potatoes. Therefore, processing equipment must be regarded as an investment by potato processors in specific assets.

5.3.2 Location (site specificity)

During the interviews it was mentioned that buyers who buy their potatoes direct from producers and fresh-produce markets locate their handling facilities close to FPMs. In the past, buyers of potatoes sourced much more of their produce from FPMs than they

do these days. They usually also require that the potatoes be delivered to the markets to reduce transport costs to processors.

5.3.3 Specialised human capital

Potato production requires a great deal of human capital as crops are susceptible to relatively more damage than other vegetables. As there are constantly new varieties of seed available on the market, the issue of choosing the right one for the specific purpose presents a considerable challenge. Some varieties make for better frying potatoes, while others perform better as mashed products.

In summary, the arguments presented in the above section indicate that both potato producers and potato processors (through the potato buyers) need to invest in a number of specific assets to be able to transact with each other. Although the degree of specificity of the assets varies, the relationship of exchange between potato producers and potato processors may be regarded as one characterised by relatively high levels of asset specificity for both parties.

5.3.4 Task programmability

When considering the transactional relationship between potato growers and potato buyers in terms of task programmability, it is evident that the relationship is characterised by relatively low levels of programmability. Potato production involves biological and scientific processes, and the quantity and quality of potatoes produced are heavily dependent on environmental conditions – a factor over which producers have limited control, despite their best managerial efforts. Although producers are able to manipulate the quality, variety and size of potatoes they produce by varying their growing and managerial practices, it is difficult to programme the quality and quantity of potatoes produced in the end.

As the total annual production of potatoes generally does not vary too much from year to year, production has little influence on processors' programmability. Annual production is largely subject to predictable national and global demand trends. Two significant sources of uncertainty reduce programmability for potato buyers and

processors on the input side of operations. The first is the varying quantities of the different quality classes of potatoes, since production is subject to environmental conditions that directly influence the quality of potatoes produced. Classes vary considerably and allow for variation of quality within the class. The second factor that reduces programmability for potato processors is producers' timing in terms of the delivery of potatoes.

Given the relatively small quantity of potatoes available in global terms it is conceivable that the timing decisions of producers to deliver their potatoes and offer them for sale could significantly influence programmability. If processors are looking for a specific quantity, variety and quality of potato at a specific time to fill a particular order, and that particular potato is not available for sale on the market, programmability will evidently be affected. This issue has been partially addressed because potatoes can be produced all over the country during the most part of the year according to production contracts with various wholesalers. However, there were still times when a specific potato variety was not available.

5.3.4.1 Separability

Transactions between potato producers and buyers are characterised by mixed levels of separability, referring to the ability to determine and measure the value of the contribution and hence reward each player in the transaction. Non-separability, also known as complementarity, exists when the combination of individual activities within a transaction yields an output larger than the sum of the outputs generated by individual activities.

When considering separability and/or complementarity in terms of the exchange relationship between potato producers and potato processors, two views are prevalent. Firstly, that the value of the contribution of each of the role players in the potato supply chain is clearly discernible and relatively easy to determine. Potato producers contribute to the potato supply chain by producing a crop, and they are rewarded for performing that function by the market-related prices they receive for their produce. Potato buyers/processors contribute to the potato supply chain by processing potatoes from raw products to various intermediate levels of potatoes, e.g. potato chips and

French fries. They are likewise rewarded for performing that function by the market-related prices they receive.

Secondly, where specific attributes of potatoes (introduced at producer level) have to be transferred through the chain to the final consumer, the relationships between the players in the chain are not characterised by high levels of separability. For instance, retailers and merchant packers of potato products cannot by themselves assure specific attributes (introduced at producer level) unless they are able to coordinate production, processing, manufacturing, etc, through the potato supply chain in such a way as to ensure certainty that the specific attributes are in fact present and preserved throughout the chain. By their actions alone, merchant packers and retailers cannot guarantee what the end consumer requires. Only through controlled coordination with producers and processors can the supply chain produce the desired end product. (Whether each role player is adequately rewarded for value added is another matter.) Arguably, the exchange between potato producers and potato processors could also be characterised by relatively low levels of separability – especially in instances where consumers demand attributes that have already been introduced at producer level.

5.4 PRODUCTION CONTRACTS

Production contracts are not new to the agricultural sector in South Africa. Seed contracts, vegetable contracts and even animal contracts have been used in agriculture for many years. However, since the early 1970s production contracting has become an increasingly important factor in South African agriculture. According to estimates by Potatoes South Africa and role players in the industry, some 45 per cent of the total value of potato production in 2002 was produced under contract arrangements. Contracts are most common in the processing industry, although they have also become standard practice in other sectors, e.g. for merchant packers.

It is evident that, from a contractor's perspective, production contracts provide an orderly flow of uniform commodities that allows a contractor control over production costs. Moreover, production contracts allow contractors the opportunity better to respond to changing market conditions. Entering into such contracts allows

contractors the opportunity to protect their investment in genetics and other intellectual property associated with a particular commodity.

The risks assigned to producers under production contracts have to be clearly understood. Producers have to consider the extent of their liability or risk in terms of casualties, losses, crop failure, disease, or adverse weather conditions. Contracts have to clearly stipulate the risks to be carried by contractors, as well as those to be absorbed by producers.

As in any contractual relationship producers will always be subject to the risk of non-payment by contractors. While government legislation provides for a limited bond for grain purchasers, similar protection may not be available for producers who raise certain crops or livestock under contract. If a contractor's business runs into trouble, a producer may become an unsecured creditor of that contractor. Moreover, if a contractor's business fails completely, a producer (who acquires facilities or equipment to perform under a contract) may lose any meaningful ability to generate sufficient income to pay for such facilities or equipment. The best way for producers to address the risk of non-payment is to contract with financially responsible contractors.

By entering into production contracts with established compensation formulas, producers could forfeit the potential for increased profits resulting from market conditions. Moreover, because production contracts are often very specific in their requirements and in limiting producers' interest in the commodities produced, producers run the risk of becoming mere providers of production services at a specific fee.

From a contractor's perspective, production contracts contribute to providing an orderly flow of uniform commodities that allows contractors to control production costs. Production contracts also allow contractors to respond to changing market conditions more effectively. The use of production contracts affords contractors the opportunity to protect their investment in genetics and other intellectual property associated with a particular commodity.

Agricultural production contracts may take various forms, depending on the commodities to be produced, the economics of the transaction, and local custom. The manner in which such contracts are structured affects the legal relationship between producer and contractor. Four major contracts are available in the potato industry:

1. Spot (or cash) markets
2. Production contracts
3. Marketing contracts
4. Vertical integration.

Spot contracts are similar to standard forward contracts for crop sales. Under such contracts producers own the crop to be produced and agree to sell their crop upon harvest to the contractor concerned.

Production contracts are considered to be *personal service contracts*. Such contracts generally stipulate that producers provide services rather than commodities to contractors. Under production contracts, producers do not typically 'own' any of the commodities that are the subject of the contract. Instead, they provide services and management facilities to the contractors concerned. Producers receive all the inputs from the contractor but are still responsible for the production of the potatoes.

Marketing contracts involving seed and vegetables can also take the form of *bailment* agreements. Bailment refers to a legal relationship where someone entrusted with the possession of a property does not have any ownership interest in it. Therefore, while the owner retains full rights to the asset, the physical possession of the asset is granted to the recipient. A grain storage contract is regarded as a good example of a bailment. The elevator which stores a farmer's grain does not have an ownership interest in the stored grain, but merely holds the grain for the farmer. Crop production contracts structured as bailment agreements provide contractors with additional protection against the unauthorised distribution of seeds and crops which could be the result of extensive genetic inputs by contractors. Under such contracts, contractors retain full ownership of the seed and crop they produce. The land of the producer is in effect leased to the contractor to produce a product.

Vertical integration refers to the union of two companies that come together in order to create a value chain that allows all parties to enjoy the benefits of business while sharing the costs and risks. A number of factors can be the motivation for entering into a vertical integration, such as costs of produced goods and services, or the market differentiation associated with each partner.

Choosing to enter into such a working agreement allows both parties to enjoy quicker service delivery with the distribution of a product, and thus increases the profit margin by generating additional sales. Applying vertical integration to the potato industry implies, among other things, that contractors have their own facilities to produce crops, while processors have their own farms for producing potatoes.

Contracts may be categorised as *informal* (oral or by means of a handshake) or *formal* (written) agreements. Oral negotiations function well in terms of strong social capital, a sound cultural heritage and a stable legal environment.

Agricultural contracts are also classified according to their terms, e.g. short-, medium- and long-term contracts. In terms of the potato sector, the duration of the contract period depends on the volume of potatoes delivered, the bargaining power of producers, and regulation by the state. In the case of a longer contract period and tighter collaboration, relational contracts are put in place.

Various contracts are available in the agricultural sector based on particular contract conditions, e.g. –

- marketing contracts (where price, quantity, quality, terms of delivery are fixed);
- production contracts (up to a certain point they regulate the production process as well);
- pre-financing or input-supplying contracts (the buyer provides seeds, etc); and
- general or so-called framework contracts (as they include only general data, they need to be considered as declarations of intent).

5.5 ALTERNATIVE LEGAL RELATIONSHIPS

It is evident that potato production contracts can take various forms, depending on the type of potato to be produced, the economics of the transaction, and local custom. The manner in which such contracts are structured affects the legal relationship between producer and contractor.

Production contracts for the potato sector may also be structured as *sales contracts*, especially those for merchant packers. Such sales contracts are similar to standard forward contracts for the sale of crops. Under production contracts the producer owns the crop to be produced and agrees to sell the crop to the contractor upon harvest. These contracts are generally subject to the approval of the product when delivered to the specified location, e.g. the distribution centre. An inspector from the merchant packer is able to grant approval in such an instance.

Finally, some production contracts may be regarded as *leases* of facilities, especially if the contracts relate to the production of potatoes for the processing industry. As processors provide all the inputs, they usually take complete control of the entire production process. Farmers receive payment for the land leased to the processor and not for the production of potatoes.

Regardless of the legal relationship created by production contracts, most contracts include provisions which specify that the producer is an independent contractor and not an employee or agent of the contractor. Such provisions are designed to limit the liability of the contractor for the actions or omissions of the producer. Similarly, such contracts typically declare that no joint venture or partnership is intended between the producer and the contractor.

5.6 RISKS ASSOCIATED WITH PRODUCTION CONTRACTS

Producers who consider entering into production contracts have to carefully assess the risks associated with such contracts.

Production contracts often require substantial long-term capital investments, e.g. if a producer is entertaining a proposal to produce potatoes under contract, a significant improvement to existing facilities will be necessary to comply with the contract. That could mean a long-term obligation to a lender to finance the costs of such improvements. Potato production also requires specialised equipment to raise and harvest crops. Before entering into such a contract, a producer therefore has to pay close attention to the provisions of the contract, e.g. the term of the agreement and the possibility for the contractor to terminate the agreement. If a substantial investment is required to carry out the contract, the producer has to ensure that the contract provides sufficient safeguards to allow for recovery of investment.

The manner in which the producer is to be paid has to be understood from the outset. Often, production contracts include formulas which base payments on a comparison of the performance of the contracted farmer to the performance of other farmers. Payment formulas evidently have to be evaluated carefully before contracts are signed.

The risks assigned to producers under production contracts have to be similarly understood. Producers need to consider carefully the extent to which they are expected to bear the risk of casualty losses, crop failure, disease, or adverse weather conditions. Contracts also need to stipulate clearly the risks to be assumed by the contractor and absorbed by the producer.

As in any contractual relationship, producers are always subject to the risk of non-payment by contractors. If the contractor's business runs into trouble, the producer may become an unsecured creditor of the contractor. If the contractor's business completely fails, or if a crop fails to meet the contract specifications, the producer who acquired facilities or equipment in order to perform under a contract may lose any meaningful ability to generate sufficient income to pay for such facilities or equipment.

5.7 SUMMARY

The decision by a producer to enter into a production contract has to be carefully considered. While such a contract may provide the producer with several advantages, the terms of the contract and the underlying economics of the contract have to be assessed before concluding the contract.

According to Peterson et al (2001), asset specificity refers to the degree to which an asset may be redeployed to alternative uses and by alternative users without sacrificing productive value. Unlike general-purpose assets that may be freely transferred across applications, transaction-specific assets are tailored to a particular user (transaction) and thus maintain their value only in a narrow range of alternative uses.

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

The aim of this study is to review the South African potato marketing chain in order to gain an understanding of the trends and forces driving the future of the potato industry, i.e. to try and understand what role the free market system plays in the potato supply chain. This will ultimately guide the future marketing management strategy with regard to potatoes in South Africa.

6.2 APPROACH FOLLOWED

The supply chain management problem was approached by examining a broad base of literature encompassing elements of logistics, distribution, marketing, operations and procurement. For that purpose, evaluates were performed of secondary data and information gathered from interviews with downstream and upstream supply chain members.

The methodology adopted for the study was a combination of desk-based research, executive interviews with industry leaders, and a strategic session with the Marketing Committee of Potatoes South Africa (PSA) on 8 November 2005. During the strategic session, the Marketing Committee formulated the following mission statement:

> *To allocate and manage funds to ensure and safeguard market share for potatoes.*

The Marketing Committee recognised that the product had lost market share as opposed to other starches and that it was accordingly important that the Committee add value to the role players in the total supply chain by engaging in initiatives to increase the per capita consumption of potatoes and improve consumers' perceptions of the product.

6.3 RESEARCH RESULTS

Industry executives interviewed in the market were enthusiastic about joint promotional initiatives. They were partial to in-store promotions where the product was presented to the customer in different formats. Informational aspects which customers considered to be important and which would encourage them to purchase potatoes, were identified as –

- cultivar information, especially the different uses of the various cultivars;
- nutritional information; and
- producer hints and recipes.

Potato cultivars are important to the retail market. Retailers need to own their own unique cultivars as mechanisms to attract consumers. Such cultivars are used to achieve distinction and serve a niche market. Cultivars also need to have a specific application and unique presentation in the market.

Consumers in this particular section of the market are highly sophisticated, and product image and presentation are important to them as customers. Packaging is also of special import, while product innovation is used to attract more customers.

Retailers perceive the *low value of potatoes* as a problem since the return per square metre in the shop reduces the profitability of the fresh-produce section. Consumers in the higher LSM markets are not as price sensitive as other consumers and retailers use product innovation (value-adding) to achieve a higher price for their potatoes. High LSM retailers make extensive use of merchant packers to repackage the product to their requirements.

The *low LSM retail* sector is under considerable pressure (caught between retailers and convenience stores who are, for example, establishing stores in filling stations) and significant competition from the informal sector. This section is in a declining or a strongly competitive stage. Price and convenience are two major competitive factors

in the market. Hawkers are good at combining price and convenience for their customers.

Low LSM retail stores usually acquire their products from fresh-produce markets, as low LSM customers are more *price sensitive* than those in the high LSM retail section. Low LSM retailers use the play-off between *10kg bags* and *7kg bags* as a pricing mechanism to manage consumer demand and prices. Packaging in low LSM retail stores is usually not broken up into smaller units as is done in the high LSM retail sector. Potato producers also use packaging as an important promotional tool for high LSM retail stores. These stores regard *in-store placements* as a key promotional strategy and are not cultivar specific, preferring an *all-round potato* that may be used for all applications.

The informal market represents a substantial market for potatoes in South Africa. In this market the product is still regarded as a *vegetable* and not as a *staple food*. Specific promotional activities may be considered to alter this perception and increase the consumption of potatoes.

Consumers in the informal sector are particularly *price sensitive* and are able to change their consumption habits very quickly. This is usually determined by the buying behaviour of hawkers on fresh-produce markets. As the budgets of hawkers are relatively limited, they want to achieve maximum turnover for the money they have available. If a specific product becomes more expensive relative to other products, they quickly switch to the other products since procurement takes place on a daily basis.

Hawkers prefer a *smaller product with good appearance* when they display their products for consumers to inspect. They are also not cultivar conscious. Transportation costs are significant to them as they have to transport their products to the point of sale. The product is repackaged from larger bags into smaller, usually plastic bags, and promotional activities and opportunities are limited. Other avenues for promotion will therefore have to be considered, e.g. radio and print, since consumers in the informal sector prefer these media.

The processing sector is highly oriented to *quality* and *specification*. The strongest growth is observed, and is expected to continue, in this market as product innovation continues and disposable household income increases. Processors also require a consistent supply of potatoes and usually engage extensively in contracts with growers. The processing market is driven by brand management, with several strong brands competing in the market. It is expected that the PSA's Marketing Committee will have limited involvement in the marketing of processed potato products since most processing companies already run extensive marketing campaigns.

Merchant packers/Wholesalers play an important role in the modern potato market by acquiring potatoes direct from farmers. They primarily utilise contracts to source products from farmers but also use fresh-produce markets on an opportunistic basis. Their products are repackaged according to the specifications of the retailers, i.e. usually high LSM retailers. Merchant packers also provide a one-stop service to retailers and manage their potato category for them in terms of consistent quality, supply and product presentation.

The *national FPMs* were given extensive attention during the study. It was clear that their role in the marketing of potatoes was on the decline. FMPs were originally set up as a service to the public and to farmers, and were managed as such by local municipalities. However, as consumer requirements became more sophisticated, the FPM system was not sufficiently developed to address emerging consumer needs (because of the atomistic nature of transactions in the commission market). Intangible (difficult to measure) consumer requirements, e.g. products free of GMOs (genetically modified organisms), the non-use of pesticides, and problematic labour practices also could not be communicated or assured by the FPM system. As a consequence, the importance of fresh-produce markets has declined in South Africa, in line with international trends. However, FPMs still have an important role to play, especially in terms of price formation in the market. Their price discovery and price formation roles have to be protected in the South African potato and vegetable supply chain. Fresh-produce markets are primarily used by small retail, informal and small processors. These institutions are therefore very important to the development and support of a sustainable SMME (small, medium and micro enterprises) sector.

The *ownership of the national FPMs* is a contentious issue. Markets are still regarded as a public good and are therefore managed and controlled by the respective city councils. However, the perception exists that FPMs are not managed for the benefit of consumers, farmers or agents, but as a profit centre for city councils. As these councils do not reinvest their profits in the FPMs, most of the facilities are in a poor state of repair. Because of the lack of consumer orientation and the limits imposed by the council structures, the management of the FPMs is usually slow to react to change and opportunities in the market. The research team was of the opinion that the objectives of the *users of the market*, the consumers, producers and agents, were not aligned to the objectives of the owners of the market, i.e. the city councils. This creates a severe management problem for the various FPMs and exacerbates the decline of the markets.

Regulations of the *Asia-Pacific Economic Cooperation (APEC)* are supposed to ensure the effective operation of the commission market system. However, the system is being replaced by wholesale systems in other national markets, e.g. Belgium, Australia and Spain. Nevertheless, the commission system remains a *fair and transparent mechanism* to discover prices. Note has to be taken of the limitations of the system in transferring information from consumers to producers. The research team has observed a strong perception that many role players are flaunting the regulations and using them to their own advantage. It is evident that APEC regulations are not properly implemented and violations are not effectively addressed. Given the importance of fresh-produce markets in developing the SMME sector, it is evident that the commission system has to be maintained. However, attention has to be given in particular to the effective implementation of the system since the regulation and effective functioning of the market are crucial to a clear and transparent marketing system.

An extensive *information system* is also crucial to the effective and efficient functioning of the commission system. In this regard the research team suggests that the price communication system and price information system be upgraded to reflect a real price system similar to that of the JSE. However, the commission system should not be the only method of marketing fresh produce in South Africa. All marketing

channels add specific value for specific customers and therefore play an important role in the market in their own right.

Farmers play a limited role in managing fresh-produce markets, which seems peculiar in that fresh-produce markets are an important marketing instrument for farm produce. *Farmers do not manage the FPMs for the optimal marketing of their own produce.* Farmers seem to consider the shipment of their product to the market as the conclusion of their responsibility in marketing their product. The following activities used by manufacturers in their Efficient Consumer Response (ECR) approach are potential activities in which farmers and markets should engage:

- New product introduction
  - improve success rate
  - reduce time to market
  - improve return on investment
  - improve quality
  - reduce cost

- Promotions
  - improve customer targeting
  - improve return on investment
  - improve cooperation in cost supply chain

- Range and assortment
  - match consumer and shopper needs
  - reduce replication
  - improve return on space

- Product replenishment
  - improve on-shelf availability
  - reduce cost
  - reduce inventory
  - reduce lead times.

Farmers are therefore not involved in aspects such as presentation on the market floor, promotions, appearance, consumer research and in ensuring that the right kind of buyers comes to the markets. To put it bluntly, fresh-produce markets are seen as dirty, unattractive places for selling farmers' produce, without proper regard for effective and efficient food safety and quality, frequented by the wrong type of buyers, and yet farmers do not seem to care.

6.4 FURTHER RESEARCH

The PSA's Marketing Committee has to engage in the following three primary activities, as identified at the strategic session:

- Information
- Promotion
- Market development.

Information is a crucial component in the PSA's value-adding activities. The PSA needs to manage information according to three different categories, namely:

(a) Technical and production information *(that is not necessarily a responsibility of the marketing committee, but is included as an important aspect of the information continuum)*

(b) Information on markets and chains

(c) Consumer information and research.

Technical and production information. The PSA has to furnish producers with technical information on cultivars, agronomic practices, sustainable production practice, plant protection, natural resource potential, and climatic impacts.

Production information should be of use to both producers and the potato value chain, and needs to cover the following:

1. Availability of seed potatoes
2. Planting readiness of seed potatoes
3. Hectares – cultivars planted
4. Prevalence of pests and diseases in production areas
5. Yield
6. Volumes, total crop
7. Type of product – cultivar and size
8. Marketing period
9. Crop estimates.

Information on markets and chains. This category of information has to provide role players with information on the flow of products within potato marketing chains. The following information has to be collected and provided:

1. Volume of potatoes in the various retail sectors and other sectors
2. Proportion of crop marketed by different role players
3. Portion of crop consumed by specific consumers
4. Volumes sold
5. Type of product
6. Price
7. Crop and price estimates.

The final category of information is that of *consumer information and research.* The meeting also identified a lack of market intelligence (i.e. the information relevant for accurate and confident decision-making in determining market opportunity, market penetration strategy, and market development metrics) in the sector. The following research has to be carried out and information made available to role players on the PSA's Marketing Committee:

1. Consumer needs (commodity versus consumer wants)
2. Product: market evaluates

3. What each consumer in the marketing chain wants
4. Size and buying power of various markets, e.g. informal trade
5. Product availability and accessibility in all markets, e.g. suburbs
6. Consumer buying and consumption patterns
7. Market potential for potatoes in different markets
8. Market chain price sensitivity.

The PSA Marketing Committee has to play a *leading role in the promotion* of potatoes in South Africa in terms of three definite activities, namely the establishment of –

1. a clear product image for promotional purposes, e.g. that potatoes offer value for money and are healthy;
2. joint marketing actions and relationships with other role players; and
3. an advertising campaign.

The Marketing Committee has to *establish a clear product image* and *coordinate and promote the use of this image* across campaigns in the industry. The marketing of potatoes subsequently has to build on the 'goodness from the earth' campaign. The following product attributes have to be communicated clearly to consumers:

- The healthiness of potatoes
- The nutritional value of potatoes
- Consumer characteristics.

Moreover, consumers have to be educated about the various potato cultivars and their specific qualities.

Potato promotion is an expensive activity and sound relationships have to be established with role players in the marketing chain to facilitate joint marketing campaigns. This is especially important in communicating the nutritional value and product image to consumers. Promotions at the FPMs also have to be considered. An

advertising campaign for the PSA has to be investigated and considered with the potential impacts being evaluated across the board.

The Marketing Committee of the PSA first has to identify and engage in activities related to the *identification of market opportunities* for potatoes, and second enhance *market access* for role players in the market. The identification of market opportunities involves increasing volumes through the market channels and shortening the marketing chain. The Marketing Committee needs to evaluate the following markets for increased volumes (amongst others):

- Processing
- Export (sanitary and phytosanitary measures do not constrain growth in the market)
- Informal markets.

New marketing channels have to be identified and considered, and they have to be communicated to producers and consumers. Market access needs to be facilitated for all role players in the market chain. The Marketing Committee also has to consider barriers to entry and exit within the different marketing channels, especially the declining volumes in the national fresh-produce markets.

6.5 CONCLUSION

The aim of the study was to evaluate and understand the potato supply chain in South Africa. That was done by representing the supply chain on paper, conducting interviews and carrying out a cost analysis. The results indicated that all the members in the supply chain were willing to cooperate and deliver a better product to the end market. The different segments into which customers may be divided all call for different marketing strategies.

It also became evident that information did not flow freely through the chain. Although the national FPMs still comprise the main tool used for the formulation of prices, these markets do not receive the attention they deserve. Profit increases

sharply as more value is added to the product. In other words, profits improve as one gets closer to the end customer in the chain.

The final aim of the research study was to provide a suitable outline in terms of the direction which the potato industry in South African could take to increase its viability and visibility to consumers.