

**INVESTIGATION OF MARKETING OF SMALL-SCALE
PEANUT AGRIBUSINESSES
IN THE VULAMEHLO DISTRICT,
SOUTHERN KWAZULU-NATAL**

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**Submitted in partial fulfillment of the requirements for the
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ABSTRACT

The main objective of the study was to investigate the marketing strategies needed for the development of a peanut agribusiness for small-scale farmers producing peanuts in the Vulamehlo District, southern KwaZulu-Natal (KZN). The study was part of the extension programme of the KwaZulu-Natal Department of Agriculture and Environmental Affairs (KZNDAEA). Another aim of the study was to examine the market requirements for peanuts purchased from Vulamehlo farmers in relation to the processing and sale of peanuts and whether or not market outlets for peanut products in KZN were available. In addition, current links between farmers, peanut processors, agents and retailers were to determine, if the marketing of peanut butter produced by small-scale farmers could be improved.

Small-scale farmers were targeted because they play an important role in rural areas for community development and for poverty alleviation and also to generate income. There is little research on small-scale agribusinesses. Small-scale farmers have unreliable supply chains and markets.

The study was conducted between May and November 2005. The data for the development of agribusiness for small-scale farmers in the Vulamehlo district were gathered from four wards of Vulamehlo: Mkhunya, Qiko, Mzimlilo and Mazabangwane. Questionnaires, a focus group discussion and observation were used to collect data from farmers and informal processors of peanut butter. Interviews were conducted with informal traders, formal traders and a formal peanut butter processor, to collect information about their marketing of peanut products. Six peanut producing farmers' associations out of ten were randomly selected from the list of farmers' associations in the Vulamehlo District. Details were obtained from the Department of Agriculture office.

The study found that the marketing requirements needing to be met by small-scale farmers include availability of adaptable certified peanut seeds, appropriate tools and equipments for cultivation, reliable supply of raw material, grading and testing of level of aflatoxin in peanuts, knowledge of processing regulation to food safety and hygiene,

proper business and management skills and relevant technology and marketing information.

The study revealed that there were no seed companies around Vulamehlo sold peanut seeds and there were no commercial peanut-producing farmers in KZN to assist small-scale farmers. Farmers were using manual tools for the peanut production process. This limited production and expansion and lowered the yield. Constant supply may be a problem for the business processing enterprises. The markets for Vulamehlo peanut producing farmers were informal and insecure. The peanut butter co-operative lacked processing equipment, processing know-how, energy-saving technology and marketing information. It is recommended that developing agribusiness linkages with suppliers, traders, farmers and processors would improve the small-scale farmers' negotiating skills. The KZNDAEA should improve links with large-scale farmers, traders, suppliers and processors, in order to obtain more information on peanut production. Contamination, especially by aflatoxin, during the processing of peanut products should be eliminated.

DECLARATION

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As the research supervisor, I agree to the submission of this thesis for examination.

Supervisor: _____ Date: _____
Professor J M Green

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LIST OF ABBREVIATIONS

ABSA	:	Amalgamated Banks of South Africa
AFRA	:	Association for Rural Advancement
AOFF	:	African Organic Farming Foundation
ARC	:	Agricultural Research Council
BGYF	:	Bright green yellow fluorescence
CRIE	:	Cross radio immuno-electrophoresis
CRSP	:	Collaborate Research Support Programme
DA	:	Department of Agriculture
DAEA	:	Department of Agriculture and Environmental Affairs
DC	:	District Council
FAO	:	Food and Agriculture Organisation
IFAD	:	International Fund for Agricultural Development
IFPRI	:	International Food Policy Research Institute
IITA	:	International Institute of Tropical Agriculture
ITDG	:	International Technology Development Group
KZN	:	KwaZulu-Natal
KZNDAEA	:	KwaZulu-Natal Department of Agriculture and Environmental Affairs
LDL	:	Low density lipoprotein
NDA	:	National Department of Agriculture
NAMC	:	National Agricultural Marketing Council
PAC	:	Peanut Company of Australia
RIMFI	:	Rural Infrastructure, Market and Finance Institute
SARPN	:	Southern African Regional Poverty Network
SPSS	:	Statistical Package for the Social Sciences
TLC	:	Thin layer of chromatography
VIDP	:	Vulamehlo Integrated Development Plan

CHAPTER 1.

1.1 Introduction

This study is important for both the Department of Agriculture and Environmental Affairs (KZNDAEA) and the small-scale farmers of Vulamehlo District, KwaZulu-Natal (KZN). In the past the Department concentrated on production rather than marketing, with the focus on household food security. This has promoted dependency because farmers are expecting the Department to look for markets where they could sell their products. The KZNDAEA has introduced a value-adding programme for its Home Economics section, but value adding will include all staff (both technicians and scientists) that is involved in crop and animal production. The study is a part of the extension programme for KZNDAEA.

In Africa 80 percent of food production is produced by small-scale farmers on small plots usually 0.6hectare to 4.9 hectare (AfricaBio 2004; Simelenga et al 2000). Many studies have indicated that farmers need a minimum of 2 hectare in order to earn sufficient income (Simelenga et al. 2000). Small-scale farmers not only provide food for their own households but also provide employment for 60 percent of working people in Sub-Saharan Africa (International Technology Development Group (ITDG) 2005).

In the developing countries, 70 percent of the poor live in rural areas and derive their livelihood from small-scale farming crop production and livestock keeping (ITDG 2005; May 1998; South African Policy 1998). This dependency on agriculture is greater in countries where hunger is most prevalent (May 1998). In developing world women produce most of the food consumed by their families and communities (FAO 2002). In Eastern Cape former homelands in South Africa, a survey that was conducted in 1997 indicated that 60 percent of the income earned came from small-scale farmers (Orkin and Njobe 2000).

It is estimated that 16 millions of South African that are living under poverty, with its incident highest in rural areas among female-headed households. Poverty in rural areas are associated with agricultural policy which marginalized small-scale farmers by restricting their access to resources such as land, credit, technical services, technology and marketing information,

access to seed suppliers, lack of infrastructure such as transport, telecommunication, water and electricity (FAO 2002; Hedden-Dunkhorst et al 2001; Masiteng & Van der Westhuizen 2001).

Black households have the lowest standard of living and are more vulnerable to poverty and food insecurity. Food insecurity and malnutrition are highest in provinces with large rural populations such KZN, Northern Province, Eastern Cape and Free State (SARPN 2004). According to Anon (2005), households that are farming on a small-scale have better nutritional status than those households that are not involved in farming.

According to Agricultural policy (1998), it is estimated that there are 16 million South Africans living in poverty with highest number in rural areas. KwaZulu-Natal has a poverty rate of 61 percent (SARPN 2004) and according to the Association for Rural Advancement (AFRA) Report (2006), 50 percent of the people of KwaZulu-Natal are considered to live in poverty.

The following facts give an indication of living conditions: These data reflect the level of poverty in South Africa.

- About 9 percent of households live in informal houses and 22 percent in traditional houses (AFRA 2006).
- In rural communities, 61.2 percent are without electricity and about 57 percent use wood as fuel for cooking (AFRA 2006).
- Only 35.2 percent of households have taps for water and 52.2 percent are using toilets that do not flush (AFRA 2006).

Food processing is probably the most important potential source of income and employment in rural areas and, to some extent, also in urban areas, because all people have to eat and will pay for it (AFRA 2006).

The Human Science Research Council has estimated poverty rates of nine municipalities in South Africa. The municipalities with the lowest poverty rate are Stellenbosch (23%) and Saldanha Bay (25%) in Western Cape. The major city with the lowest poverty rate is Cape Town (30 percent). Pretoria and Johannesburg have higher poverty rates (35% and 38%)

while Durban has a poverty rate of 44 percent. The poorest municipality is Ntabankulu in the Eastern Cape, where 85 percent of its residents live below poverty line (SARPN 2004).

Small-scale farmers provide most of the food produced in Africa as well as employment for 60 percent of working people. Small-scale resource-poor farmers living in less favourable areas of the developed world are almost entirely dependant on agriculture and are more vulnerable to fluctuation in output (Bishaw & Turner 1998). Improvement in crop production will play a crucial role in ensuring food security and alleviating of poverty for small-scale farmers (Anon 2005, Bishaw & Turner 1998). Food security can only be achieved through increased agricultural production (helped by the provision of inputs, credit services), improved processing and storage facilities, better marketing and distribution (infrastructure) (FAO 2001). In developing countries, financing constraints are considered as a limiting factor especially for small-scale farmers particularly in agriculture and agribusiness (Puri 2005). Access to capital is a major factor for improving the material conditions of small-scale farmers and other rural poor (Viciani et al 2001).

Numerous studies confirmed that improving access to land has major impact on reducing poverty and hunger. Small-scale farmers employ more people and the income generated is spent locally on non-farm products that provide employment for the landless and land poor. In the developing world, women produce most of the food that is consumed by their families and their communities. Improving access to land for women and small-scale farmers is crucial to increase both food security and sustainable production (FAO 2002). Due to the high rate of unemployment both in rural and urban areas, small-scale farmers will be able to hire casual labourers to provide the necessary labour, only if they make enough money selling their agricultural production.

Improvement in crop production for small-scale farmers will play a crucial role in ensuring food security and alleviation of poverty for farmers living in less favourable areas who are entirely dependant on agriculture for their livelihoods (FAO 2002). A potential solution to the rampant poverty is to investigate whether peanut-producing farmers can improve their incomes with this crop. According to literature peanut production in Senegal provides 75

percent of the national agricultural production and 50 percent employment of the population (Badiane 2001).

Poverty is high throughout Ugu district and Vulamehlo, a district municipality. The highest concentration of population is located in the coastal strip, while a number of people (70 %) living in poverty are located in the interior.

According to Vulamehlo Integrated Development Plan (2006), Vulamehlo is experiencing high levels of unemployment and poverty. The following are the living conditions of the people of Vulamehlo:

- 30 percent live in formal dwellings,
- Two percent of households live in informal dwellings,
- 60 percent live in traditional dwellings.

In Vulamehlo 94 percent of the population are without electricity, 45 percent of the population without access to potable water and 60 percent are without access to sanitation facilities. Only 55 percent of the households have access to potable water. Household income is one of the most important determinants of poverty level in the district. In Vulamehlo 60 percent of the population are unemployed. (Vulamehlo IDP 2006).

Table 1.1 Vulamehlo Annual household incomes

With no income	34 percent
R1- R9 600	39 percent
R 9 601- 153 600	26 percent
Above R 153 600	1 percent

These incomes in Table 1.1 reflect that there are very few people who earn adequately, enough for their households. Small-scale farmers generally produce crops and food, with which they are then unable to realize a financial return. They cannot sell what they have produced but need the money for inputs into their next season's farming and also other purchases (Bishaw & Turner 1998).

Peanuts are commonly grown in Vulamehlo and so processed peanuts should provide such an opportunity of increasing income generated for small-scale farmers in Vulamehlo. The community will also benefit from the generated income and then improve food security of their families. Processing peanuts (roasted snacks and peanut butter) if there is a sustainable market, will lead to the creation of jobs and small industries that will reduce unemployment and to alleviate poverty.

The main objective of the study was to investigate the market strategies needed for the development of peanut agribusiness for the small-scale farmers producing peanuts in Vulamehlo District, southern KZN. The marketing strategies to be investigated were:

- The market requirements for peanuts purchased from small-scale farmers in relation to further processing and sale of raw peanuts.
- To determine the potential available market outlets for peanut products for small-scale farmers in KZN, where these outlets for small-scale farmers in Vulamehlo District were situated.
- To investigate whether marketing of peanut butter produced by small-scale farmers could be improved by investigating current links between farmers, agents, processors and retailers.
- Small-scale farmers may need technical advice on how to ensure that their peanuts have acceptably low levels of aflatoxin.

1.2. Research Problem

The aim of the study was to investigate how to use marketing of value added and processed peanuts to reduce poverty in Vulamehlo district KZN. Aspects such as market requirements for peanuts purchased from Vulamehlo small-scale farmers in relation to further processing and sale of raw peanuts, potential market outlets available in KZN and current links between farmers, agents, processors and retailers need to be investigated.

1.3 Research Sub-problems

Sub problem 1

What are the market requirements for peanuts purchased from farmers in relation to further processing and sale of raw peanuts?

Sub-problem 2

Can the Vulamehlo small-scale farmers meet the market requirements in relation to further processing and sale of raw peanuts?

Sub-problem 3

What market outlets for peanut products are available in KwaZulu-Natal (KZN)?

Are there sufficient outlets in KwaZulu-Natal for peanut products available from Vulamehlo district small-scale farmers?

Sub-problem 4

Can the marketing of the peanut butter produced by Vulamehlo small-scale farmers be improved through investigating current links between farmers, agents, processors and retailers?

The aim of the study was to investigate the market requirement for peanuts purchased from small-scale farmers of Vulamehlo in relation to further processing and sale of raw peanuts. The market requirement investigated were availability of peanut seeds, production tools, land, harvesting, storage, marketing and peanut processing and marketing for both individual farmers and cooperative members. Research has shown that peanuts provide 75 percent of the national agricultural products and 50 percent employment in Sub-Saharan Africa (Badiene 2001). Peanuts are good source of protein in developing countries and a source of income (Chrompreeda & William 1998). It is estimated that half-billion people in the world rely on peanuts as their primary source of protein. Most of these people are small land holding farmers especially in Africa, South America and South East India (Wikipedia 2006). The main factor limiting small farmers is their ability to increase their output has been the lack of technological infrastructure to sell peanuts at a cost effective rate. Peanuts provide a source of purchasing power to small-scale farmers (FAO 1998). Provision of technology and marketing information could assist small-scale farmers of Vulamehlo to generate income and to create job opportunities. Limited access to credit, lack of appropriate technology and marketing information, lack of technological capability, the unreliable supply of raw material poor

quality control among other things have served to constrain the development of small-scale agribusinesses.

Lack of appropriate food processing equipments and storage facilities hinder the ability to process large volumes of products over a long time. There is a need to enforce food safety and hygiene standards, as well as to protect consumers against nutrients insecurity and undesirable taste. Training that is offered to the agribusiness needs to include business and management skills as these skills are lacking in most business people especially small-scale farmers. Government policies that enhance performance of peanut butter processors need to be put in place as a tool for empowering small-scale processors. Farmers need to be exposed to available technologies and range of products, that can be manufactured to encourage uptake of agribusiness (Mhazo et al 2003).

For small farmers to be successful, development or acquisition of proper production tool and processing equipments, provision of processing skills through training, provision of appropriate packaging material and marketing skills and information should be made available to small farmers in order to meet the market requirements of their products.

The other aim of the study was to determine availability of market outlets for peanut product in KZN. Rural roads are a fundamental for agricultural development. Rural transport system is a major constraints faced by small farmers (Eastern Africa Root Crops Research Network 2002). Marketing of small-scale farmers is largely informal. Small-scale farmers in rural areas rely on the demand from local informal market, which is small and unreliable (Mhazo et al 2003)

The study also investigated whether marketing of peanut butter produced by small-scale farmers could be improved by investigating current links between farmers, agents, commercial processors and retailers. The development of agricultural linkages could only be successful through the provision of management and business or entrepreneurial skills. On the production side it entails coordination for planning production, its quality in accordance with market requirement price. In the final-product market, negotiating skills are needed for inputs and productive factors between the producer (seller) and the buyer. There is a need for greater

interaction between agents, government, farmers, processors and raw material suppliers and input suppliers (FAO 2001)

The study focused only on small-scale farmers producing peanuts in Vulamehlo District because this is the only District of Ugu Municipality District that produces a lot of peanuts and the peanut butter processing plant is situated in one of Vulamehlo wards called Mkhunya ward. Transaction costs will be lower if the peanut butter manufacturing cooperative purchased raw peanuts from other small-scale farmers within Vulamehlo District. Small-scale farmers producing peanuts were targeted because small-scale farmers play a vital role in rural areas for community development and for poverty alleviation and also to generate income (ITDG 2005, Agricultural Policy in South Africa 1998).

Research has shown that consumers have negative attitude to products that are manufactured by the small-scale farmer. Consumers perceived small-scale farmer's products as unhygienic and adulterated (NDA & FAO 2001). Lack of access to information about relevant technologies is also a barrier. Most research of food technology in the world favours medium and large- scale processors. There is little research on small-scale processing and small-scale farmers have unreliable markets. There is a widespread lack of skills as the majority of small-scale farmers that are involved in processing are poor and marginalized women and men. To improve their livelihoods through agribusiness, they require technical skills, business management and marketing skills.

Agribusiness can reduce wastage by processing excess product, enhance food security, as processed food could be available the whole year round if properly processed and stored appropriately. The value of this study is that if KZNDAEA could provide proper training for its extension service and conduct appropriate research on agribusiness especially in peanuts, as peanuts are important cash crop for small- scale farmers and source of protein in developing countries. If KZNDAEA does not provide proper training to small-scale farmers on production and processing of peanuts, peanut industry will be affected. Elimination of aflatoxin contamination is a high priority for small-scale farmers in peanut industry because of human

health concerns. Proper post harvest handling that includes proper drying, selection of damaged and peanuts and appropriate storage could reduce level of aflatoxin.

1.4 Study limits

The study limits are as follows:

The investigation of the market strategies for the development of peanut agribusinesses for small-scale farmers peanut producing was done in one of three Districts of Ugu Municipality, Vulamehlo. The results therefore of the study cannot be generalized to small-scale farmers producing peanuts in any other Districts or other Municipalities of South Africa. The small-scale farmers producing peanuts in other districts were not investigated to find out the market strategies they used for the development of agribusiness.

There were no commercial farmers producing peanuts in Vulamehlo district and therefore commercial farmers could not be included in the study as a parallel system of production and marketing. The result of this study could not be extrapolated to other areas, as research will only be done in Vulamehlo District. Lack of technology and access to information as experienced by the small-scale farmers is a major constraint to marketing but will not form part of this study.

1.5 Conceptual framework of study design

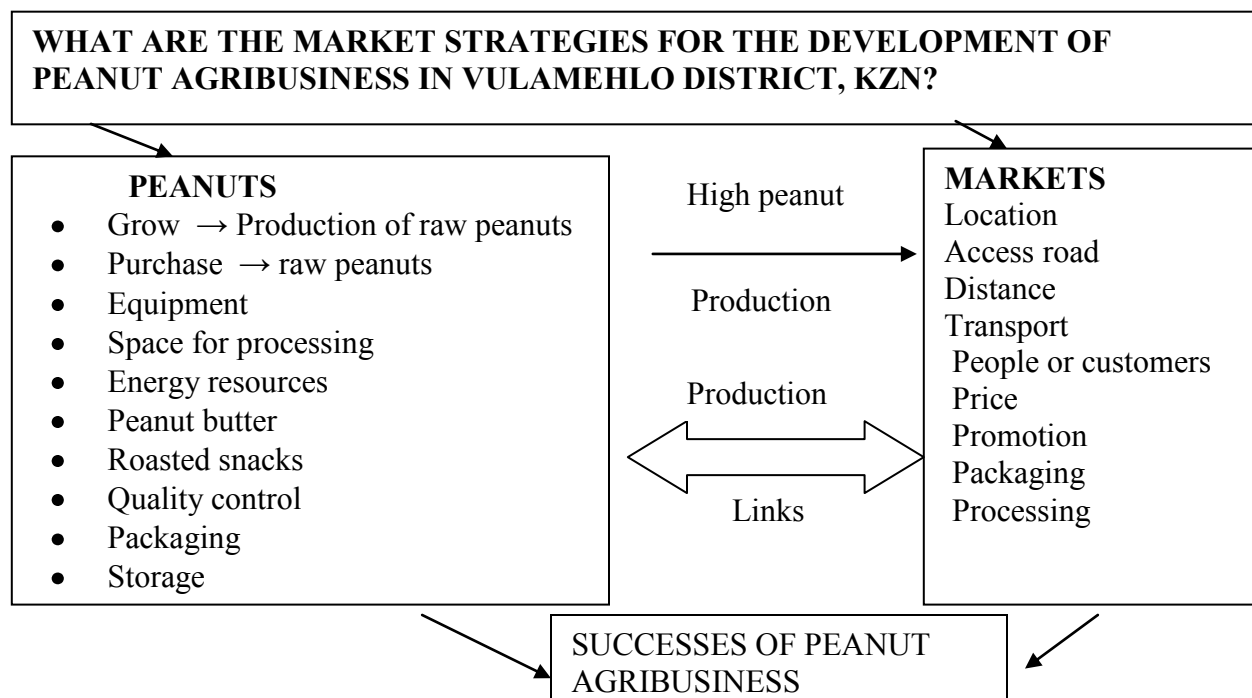


Figure 1:1 Study design to investigate peanut agribusiness opportunities.

1.6 Operational definitions

Marketing strategy is concerned with finding a sustainable way for a business or organization to compete in a continuously changing world. A strategy is a plan of action designed to achieve the long-term goal of the business or organization (Dalrymple & Parsons 2000).

Processing of peanuts is the changing of raw peanuts to another state such as peanut snacks or peanut butter to prolong the shelf life (Rowland 1993). Value adding is the altering of a product to another form rather than it was in its original form such as peanuts processed to make peanut butter. Value adding results in being able to sell a processed product at higher price due to the value added to the product such as processing and packaging; thus providing potential for more profit (Fellow 1997).

Marketing is a process whereby a marketer performs a number of activities in order to meet the objectives of the business and paying attention to marketing mix (target customers, product, packaging, price, place, promotion and process) to satisfy the needs and wants of the targeted customers or consumers and to make a profit (Perreault & McCarthy 2002).

1.7 Pertinent assumptions

It is assumed that marketing of processed peanuts can be improved in rural areas and that improvements in production can be achieved with the provision of more relevant information.

1.8 Proposed structure

This study will include the following: -

Chapter One discusses the importance of the study. This includes research problem, study limits, delimitations, operational definitions and lastly pertinent assumptions.

Chapter Two will discuss the related literature review in terms of peanut production, cultivars, planting, harvesting. Storage of peanuts, peanuts processing and marketing (product, packaging, pricing, transportation and promotion) will also be described.

Chapter Three will present the research methodology: study area and sample characteristics, how a social survey for small-scale farmers, traders, and commercial peanut butter processors was conducted. Focus group discussions with peanut butter cooperative will also be included in the study. Data collection and the analysis of the data will be discussed.

In Chapter Four the results of the study will be presented and discussed.

Chapter Five will discuss marketing strategy for agribusiness by looking at the data gathered from farmers, cooperative focus group discussion, traders and commercial processor. Lastly, conclusions and recommendations will be presented.

CHAPTER 2: REVIEW OF LITERATURE

2.1 Introduction

Peanuts are grown for their protein and energy richness. Peanuts are an excellent food source as they are inexpensive and nutritious (Smith 2002). Like other legumes, peanuts fix nitrogen in the soil and are a valuable crop used in crop rotation (Burgess et al. 2000).

The origin of peanuts is unknown, but peanuts were first discovered in Brazil and Peru and carried to Africa by early explorers and missionaries (Hudson 1994:1995). According to Burgess et al. (2000), peanuts are a member of the legume family and produce their fruit underground. Peanuts grow well in light, well-drained soils and sandy soils. Peanuts require approximately 110 to 140 days to mature. The most important producers of peanuts in Africa are Nigeria, Senegal, Cameroon and Mali. The total estimated production of peanuts in West Africa is about 2 million tons in an area of about 2, 9 million hectares. During the 1970s peanuts were the cheapest crop, with a high food value and a long shelf life. There was a lack of interest in peanut production, as peanuts were regarded as food for the poor because growing and harvesting of peanuts was slow and difficult (Boardwalk Peanut Shoppe 2002).

Peanuts in the USA are consumed as whole-nut food products and 50 percent of it is used to manufacture peanut butter. In India, a large quantity of peanuts is crushed to extract oil and meal. After extracting the oil, the meal is used as animal feed or fertilizer (Cooper & Burton 2002). The main food value of peanuts is protein. Peanuts contain a high proportion of fats; therefore they provide a good source of energy (Goeltenboth 1990: 113). Rowland (1993) reported that peanut seeds contain about 45 per cent oil, 27 per cent protein and 17 per cent carbohydrates (Hudson 1994). Epidemiological studies have confirmed that consumption of peanuts as a snacks food, at least five times a week, may contribute to protection against cardio-vascular diseases, diabetes and gallbladder ailments (Higgs 2006).

Peanuts are rich in the anti-pellagra vitamin, nicotinic acid. Refined peanut oil is used in the food industry for cooking, salad dressing and for manufacturing margarine and soap (Burgess et al. 2000). The nutritional value of peanuts will be discussed more fully in section 2.5.2.

Peanuts are the most important crop for commercial and small-scale farmers in South Africa and other countries (Cilliers & Swanevelder 2002). It is recommended that farmers should harvest their crops at exactly the right time. If they harvest their peanuts before time, a large number of pods will not have reached maturity. If peanuts are harvested too late the pegs (stem with peanut) may snap and many pods will remain in the soil (Cilliers & Swanevelder 2002).

2.2 Market requirements of peanuts

The major constraints of agricultural production for small-scale farmers are poor soil fertility and low soil organic matter Agricultural Organic Farming Foundation (AOFF) 2003). The other constraints are the national and international governments' unfriendly policies, weak institutional mechanisms and poor linkages among farmers, development agencies and researchers. These prevent the adoption of improved agricultural technology that can reverse these constraints. Most small-scale farmers use traditional production methods; which result in the poor adoption of improved technology (AOFF 2003).

Small-scale farmers use labour-intensive methods during production and post-harvest, as they do not have the resources to invest in machinery that can facilitate cultivation and harvesting of the crop. The available household labour is inadequate. This then limits the area that can be planted. For cereals and legumes the loss that occurs during harvesting and storage can be as high as 15 to 20 percent of the quantity harvested (International Institute of Tropical Agriculture (IITA) 2004).

Provision of appropriate equipment and storage facilities for production, harvesting and storage will assist farmers to achieve high yields and agronomic practices will be improved. Improved post-harvest systems will facilitate processing and marketing of high-quality crop products. Sustainable agriculture requires the use of technology such as certified seed, fertilizer and appropriate management skills, all of which are which is lacking in small-scale farmers. Agricultural inputs and outputs are fragmented and underdeveloped in rural areas. The transaction cost of acquiring inputs, such as seed and fertilizer, are costly and usually not available in rural areas. The available seed in local traders is of poor quality. Farmers have to

travel a long distance to purchase inputs, as suppliers are far away from the rural areas ((Rural Infrastructure, Finance Institute (RIMFI) 2005).

High crop production will be attained if efficient market supports it. Access to inputs will remain a critical constraint to improve productivity, while the promotion of agribusiness and storage will improve the income and investments in production and related activities.

Drought is one of the major causes of poor crop performance and poor yield, as the majority of small-scale farmers do not have irrigation. Dry seasons will result in insufficient raw peanuts for processing (Harutahithansan 1998). The probability of drought is highest at the beginning of the planting season, causing farmers to plant late. Drought stress during germination will severely affect plant establishment. When drought occurs during flowering stage crop, yield will be reduced or there will be a complete crop failure. Improved crop varieties that will withstand drought and improved soil and water management will overcome the adverse effects of drought experienced by rural, poor small-scale farmers (RIMFI 2005).

Contract farming is becoming more common in fruit and vegetables and other commodities, such as peanuts, needed by processors and supermarket chains in the world. In practice, price guarantees are not enforceable and contracting often fails because of the dispute between farmers and their customers over grading and pricing (RIMFI 2005). Contract farming will be done as this is dependant on many other factors to facilitate marketing of small-scale farmers' produce and access to extension service and credit. Small-scale farmers have a weak ability to negotiate with processors and other marketing agents, as they have limited marketing information and are poorly organized. Local market would have greater advantage for small-scale farmers in terms of access and more flexibility regarding the quality and quantity required by the market (IITA 2004).

Marketing opportunities for small-scale farmers are limited. Farmers can market directly from their gardens to surrounding communities. They can also supply hawkers who come to their gardens with their transport to purchase the farmers' products. The hawkers then sell these products in local towns and cities. Some farmers sell their products to retail outlets such as the

OK and Spar. The retailers buy directly from small-scale farmers. Small-scale farmers use market stalls in rural areas. They also sell their products in a contract market such as government institutions, for example hospitals, prisons and schools (IITA 2004).

2.2.1 Production

Peanuts grow well in sandy soils with the pH, ranging from 6.0 to 6.5. Peanuts grow best if they follow a crop which was well fertilized. They need 500 mm to 1 000 mm of rain. A dry period is best during the ripening and maturing of pods, as it improves the yield and the quality of the peanuts. Peanuts grow well in hot, sunny conditions, with daytime temperatures between 25°C and 34°C (Burgess et al. 2000:136).

Peanuts are tolerant to drought, but moisture is needed during all developmental stages. If there is insufficient moisture during any development stage yield will be reduced. In the flowering, peg formation and fruiting stages the crop can experience moisture stresses, as during these stages there is a great need for water by peanuts. If the moisture occurs during the early stage of development and the crop get moisture before fruiting, the crop will be compensated for the earlier stress (Rowland 1993).

If there is insufficient moisture at a later stage of production, advanced crop maturity will occur and this will prevent the development of fruit. The roots and fruit must have sufficient moisture, because the pegs and fruit are responsible for the absorption of minerals from the soil, including a large amount of calcium (Rowland 1993). It is important that peanut plants have sufficient moisture, so that the pods will absorb these minerals.

Warmth is very important for the growth and development of peanuts. Flowering may be retarded if the temperature falls below 20°C, maturation of fruit would be delayed. Peanuts tolerate high temperatures very well, but only if there is adequate moisture. The most suitable soils for peanuts are light, sandy loam soils. Peanuts also do well on clay soil, if it is well-drained and aerated, but harvesting will be difficult due to the amount of soil that will stick to the pods. If the soil is compact it will be difficult for the pegs to penetrate the soil and

expansion of the pods may be impeded, which could result in poor yield. Soil should have sufficient calcium content, for the proper development of pods (Rowland 1993: 246).

Peanuts have a tendency towards depleting the soil, even though it is a leguminous plant (Smartt 1994). Peanuts are often grown on low fertility soils which are unsuitable for other crops. It is important to practise crop rotation when planting peanuts to reduce risk of diseases and to increase the yield (NDA 2002). Peanuts are always intercropped with other crops such as maize or sorghum. Intercropping is the planting of two or more crops together on the same land. It is commonly practised by small-scale farmers (Peterson 1994). It is not recommended to plant peanuts on the same land more frequently than once in three or four years. Peanuts should be alternated with fertility-building crops such as maize or sorghum, as peanuts have the ability to fix nitrogen in the soil; so the crop that follows peanuts will not need the application of nitrogen fertilizer (Smartt 1994).

2.2.2 Varieties of peanuts



Upright Variety

Creeping Variety

Figure 2.1: Peanut variety (Wikipedia, 2007)

The upright variety is grown mostly in developed countries, with mechanized farming and harvesting. The creeping variety is grown in less-developed countries, using primitive cultivation methods. Traditional varieties of peanuts are alternately hypogaea and sequential branched (*fastigiata*) which vary in maturity period from 120 to 145 days and from 90 to 105 days, respectively (Rowland 1993). The alternately branched Virginia type is more tolerant to leaf spot disease than the sequential branched Spanish and Valencia types. Several institutions have made an effort to select and breed varieties that are rosette virus resistant and drought tolerant (Rowland 1993).

There are two types of peanut varieties, namely an upright variety, which is grown mostly in developed countries for mechanized farming and harvesting, and a creeping variety, which is grown in less-developed countries, using primitive cultivation methods (Wikipedia 2007). There are three types of peanuts: Spanish small and roundish peanuts; Valencia medium sized, oval shaped peanuts often used for salted peanuts, and Virginia large mixed peanuts usually added to mixed cocktail peanuts (Bender 1990). All three types of peanuts are used for making peanut butter, sweets or for home use (Hassan *et al.* 1995, Rochl 1996).

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Farmers can select their cultivars from a wide range of cultivars on the market. The well-known cultivars are Akwa, Anel, Billy, Harts, Jasper, Kwarts, PAN 9212, Robbie, Sellie, Norden and Selmani (Swanevelder 1998, DA 2002). These cultivars are available in South Africa, as well as the Spanish type varieties. All these cultivars can be grown under irrigation, but Norden, Semani and Billy can only be successfully grown under irrigation. Kwarts is recommended for late planting, while Harts is for the shortest growing season (Swanevelder 1998). The season can be stretched, therefore, by planting a variety of peanut cultivars.

2.2.3 Sowing

Planting of peanuts should only be done if the soil has sufficient moisture, or after at least 20-25 mm of rainfall (Rowland 1993:247). Sufficient moisture in the soil at planting time is important late planting will result to aflatoxin contamination not suitable for human consumption (Department of Agriculture 2002, FAO 2007) see Appendix F. Seeds should be shelled immediately before sowing them, to reduce pest damage and fungal infection of seeds during prior storage. Large-scale farmers practise row planting mechanically, while small-scale farmers use their hoes to make rows. Small-scale farmers use hand hoes because machinery is expensive to buy and to maintain (Ray & Herren 2002, Hart 2003). It is better to plant on ridges on heavy soils, as it will be easier to lift plants during harvesting (Rowland 1993).

2.2.4 Pests and diseases

The pests that can damage peanuts directly are mammals such as rats, ground squirrels and porcupines. They cause serious losses. Peanut hoppers (locusts) cause local damage, especially in the Eastern and Central Provinces of Kenya. Rosette virus can be very damaging, by causing the plants to be stunted and to produce negligible yields. It is less prevalent if plants are closely spaced (Rowland 1993).

2.2.5 Weeding

Peanuts are susceptible to competition and weed control should be started during land preparation. Weeds compete with the crop for moisture, nutrition, light and space. Effective weed control means that weed should be controlled all the year round. Weed can be controlled by using chemicals, mechanical or manually (NDA 2002) A clean seedbed is important. Row planting with oxen will facilitate weeding. Peanut plants may be earthed up during weeding to encourage the penetration of the pegs into the soil. It is important to avoid covering the plant with soil as this will damage the developing pegs (Rowland 1993:248).

2.2.6 Harvesting

Peanuts must be harvested at exactly the right time. Peanuts should be harvested about four months after planting. It is important to allow peanuts to mature, as immature peanuts will lose

much weight after harvest and develop an unpleasant flavour. When the peanut plants start to turn yellow in colour and shed some of the pods just below the soil surface, the peanuts are ready to be harvested. The shells will start to turn brown, with dark veins; if these signs appear and conditions are hot and dry the peanut plants should be left for a further two weeks in the field before harvesting to dry properly (Burgess et al. 2000). Harvesting at the proper time will ensure that a high percentage of mature pods will remain on the plant (Hassan et al. 1995).

Peanut plants can be lifted by hand or by machines, when most of the leaves have fallen and the pods are almost mature. The pods are stripped off only if the plants have been dried in the sun for a few days. Peanuts can be shelled by hand or machine. In most cases, small-scale farmers shell peanuts by hand, as they do not have shelling machines. Hand shelling is laborious and difficult if the peanut variety has thick shells such as the Virginia cultivar (Rowland 1993: 241).

In order to get good quality peanuts, the correct harvesting procedure is essential. Peanuts can be harvested by means of the stacking method (manually) or mechanically. As weeds have a negative impact during harvesting, it is recommended to apply an optimum herbicide before harvesting, especially if maize was used in a crop rotation with the peanuts. If the harvesting is done mechanically, peanut plants are placed in windrows after being lifted. In the stacking method the taproots are cut and the plants are collected and stacked by hand (Swanevelder 1998: 58).

The lifting process means cutting of the taproots 10 to 15 cm under the soil surface. The plants are loosened so that they can be removed easily from the soil by hand. After the plants have been lifted, they are collected in bundles of 10 to 20 plants and are placed in stacks. It is important to remove soil from the pods, as soil will lead to the development of moulds and fungi (Swanevelder 1998). When the plants are dry the pods are shaken or pulled from the plant. The remaining parts of the plants should be composted and returned to the soil (Burgess 2000:136).

2.2.7 Storage

Most grain and legumes such as peanuts, after harvesting, are stored for at least one growing season and can be stored for a longer period. Peanuts are a semi-perishable crop and their quality will deteriorate during storage. Peanut quality cannot be improved during storage but they will lose moisture during storage, which may last from September to April or May. This will depend on when the peanuts are delivered to the shelling plant (Melouk & Shokes 1995). Peanuts are stored in tanks, bins, concrete silos and in flat-type warehouses, with natural or artificial ventilation systems. Ventilation systems are used to maintain the quality of peanuts by removing the excessive heat and moisture and to equalize the moisture content and temperature of the peanuts. At 21°C, unshelled peanuts could be stored for four months. Shelled peanuts can be stored in a refrigerator, to maintain relative humidity (Bernnet 2002). Losses during storage are caused by insecticides, rodents and variation of moisture and temperature.

2.3. Peanut problems

Peanuts have a high level of aflatoxin, causes health risk to humans and animals if contaminated product is consumed. Aflatoxin occurs in peanuts crop in the field prior to harvest. Post-harvest contamination can also occur if peanuts are not dried properly. Peanuts are known to have common allergens. Peanuts and other peanuts such as walnuts, hazel nuts and almond are known to be common allergens. These are allergic reactions including rashes, itching, respiratory and gastrointestinal difficulties that can lead to death.

2.3.1 Aflatoxin

Peanuts should be properly dried, because if peanuts become moist or stored under poor storage conditions, there will be a risk of fungal growth (Fellow 1997). This fungus is a serious health risk and commonly attacks peanuts. It is called *Aspergillus flavus* and produces a toxin called aflatoxin, which can cause cancer if consumed over a long period (Axtell 2002). Aflatoxins are naturally occurring mycotoxins that are produced by many species of *Aspergillus* fungi, most notably *Aspergillus flavus* and *Aspergillus parasiticus*. The fungus is black in colour and will grow on peanuts if they are not properly dried. It is very important that shelled peanuts be quickly and fully dried after harvesting (Axtell 2002). Authorities

usually make sure that the level of aflatoxin is safe by checking products made from peanuts. Fuller (1992) warned that peanuts are susceptible to a cancer-causing substance, but unfortunately in the Third World and in rural areas checking for the presence of aflatoxin is not always done. Aflatoxin is associated with esophageal cancer. There have been reports of cirrhosis of the liver, being found in children caused by contaminated meal (Fuller 1992).

Products such as maize or sorghum can grow fungi that produce aflatoxin if they are stored in moist conditions. High levels of aflatoxin are found in maize and peanuts can also contain high levels of aflatoxin. Peanut oil and products derived from peanut oil do not contain aflatoxin (Weisnagel 2004).

2.3.2 Removal of aflatoxin

The only sure method of removing aflatoxin is to prevent it from forming, by taking good care during harvesting not to damage peanuts, to let peanuts dry quickly and to store peanuts in suitable storage, without moisture. In Senegal research was conducted to examine detoxification of peanut paste using local Senegalese clay. It was found that Senegalese clay reduces the amount of aflatoxin in peanuts (Kane 2006). Using food additives such as sodium bisulphite, sorbate, propionate and nitrate can reduce aflatoxin production (Kiple & Ornelas 2001). Certain food components and spices such as pepper, mustard, cinnamon and cloves may inhibit mycotoxin production. Visual screening of peanuts will reveal the conical heads of *Aspergillus flavus*.

Aflatoxin can also be checked by using ultraviolet light, for unshelled peanuts for the presence of bright greenish yellow under electronic colour sorting techniques. However, neither of these techniques will screen out all aflatoxin contamination. The tests that are precise are those that include thin layer chromatography (TLC) and high performance liquid chromatography. Immunological methods are also useful, but precautions must be taken when doing analysis, since aflatoxin is highly carcinogenic (producing cancer). There is research currently in progress on the development of standardized methods for determining aflatoxin in peanut products. Other research is concentrating on eliminating the contamination by aflatoxin or inactivating aflatoxin. Chlorine gas can inactivate one aflatoxin called aflatoxin B1. Ammonia

and ozone treatment of peanuts also appeared to work. These methods, however, are still experimental (Kiple & Ornelas 2001:375).

The liver cancer in question is thought to be caused by Hepatitis B, with other factors such as aflatoxin acting as promoters or as less-potent initiators. The problem of aflatoxin contamination is particularly serious in developing countries, because of poor storage and processing issues. For example, aflatoxin levels in Pacific countries such as Fiji and Tonga are high and they have high liver cancer rates. Therefore, in addition to improving inspection methods, techniques must be developed to decrease carcinogenicity of aflatoxin in contaminated foods for humans and animals. One technique that could be used to decrease aflatoxin contaminated peanut cake is ammoniation. Ammoniation can reduce aflatoxin in corn and peanut cake meal products by up to 99 percent (Kiple & Ornelas 2002).

2.3.3 Peanut allergens

Any food has the potential to cause an allergic reaction, but peanuts and other nuts such as walnuts, Brazil nuts, hazel nuts and almonds are known to be common allergens. In cases of extreme allergy, nuts can trigger a life-threatening reaction known as anaphylaxis. Symptoms include facial swelling, shortness of breath, dizziness and loss of consciousness. It is therefore important that those who are allergic to peanuts should take every precaution to avoid peanuts (Hannah 2000).

Refined, processed peanut oil is not allergenic in western countries and will not cause an allergic reaction in peanut-allergic individuals (Weisnagel 2004). According to Clark & Coll, quoted by Weisnagel (2004), there are 19 peanut allergens, the major ones being Ara h1 and Ara h2, to which 70 percent of subject patients have reacted adversely. Although China, has a high rate of peanut consumption, the prevalence of peanut allergy is lower than in the United State. The study conducted in 2003 by Maleki et al. 2003 to examine whether or not the method of preparing peanuts could cause an allergy shown that roasted peanuts caused the major peanut allergen called Ara2 (Soheila et al. 2003). It was discovered that boiling of peanuts, practised in China reduced the allergenicity of peanuts, compared with the method of the dry roasting method practised in the United State (Beyer et al. 2001).

Many different peanut allergens contain protein. The allergens have been treated by the using radio allergenabsorbent test (RAST), and immunological technique, such as cross-radio immunoelectrophoresis (CRIE), two-dimensional electrophoresis and immunoblotting, to isolate and characterize peanut allergens. At present it is clear that there are multiple allergens that exist in peanuts (Kiple & Ornelas 2002:372).

A well-characterized peanut allergen has been identified in patients with atopic dermatitis and positive peanut allergens called Ara hI *Arachis hypogaea* I. High atopic infants and children appear to be particularly likely to form antibodies that respond to peanuts, as well as to other food proteins. These children started to produce antibodies and to respond to inhalant allergens during their first and second years of life. They are defined as highly atopic, as their serum level was ten times higher than those of normal infants and their RAST tests were positive on many occasions.

2.3.4 Signs of peanut allergy

The signs of peanut sensitivity range from urticaria to angioedema and asthma and occasionally even to anaphylaxis and death. Crude extracts, as well as purified peanut proteins such as arachin, conarachin and concanavalin and other such as glycoproteins are all allergenic.

Histamine

Peanuts, by nature, contain histamine. The storage and roasting of peanuts will increase histamine, which will possibly promote allergy-like symptoms. Histamine concentration is 0.08 to 0.56 nmol per 100g of raw peanuts, when compared to 35-150 nmol per 100g of roasted peanuts. Processing of fermented peanuts is likely to produce a large amount of histamine (Smartt 1994).

2.4 Small-scale peanut production

Small-scale farmers are the producers of low-priced raw material and manufacturers or firms add significant value to raw material to satisfy the needs of customers. Manufacturers are not only transforming raw material into finished food products but also forming a link with the

product sellers, which are wholesalers and retailers. They are also responsible for the transportation of the product to the distribution channel (Golob et al. 2002).

In South Africa, small-scale farmers are seen as a non-productive, non-commercial, subsistence livelihood sector prevailing in rural areas (Dunkhurst & Mollel 1999). Although there is a National Farmers' Union in South Africa, it does not provide any support needed for the small-scale and emerging farmers, due its financial shortage (Dunkhurst & Mollel 1999:101). Small-scale farmers are subject to high illiteracy. A training programme for farmers should be focused on visual aids material and adequate illustration by weighing and applying current market information (for example price /kg) to determine the current market value of products (Coetzee et al. 2005). For small-scale farmers to be successful they need sufficient land and quality of products, access to capital and sound financial structure, market access, access to input, marketing and production information and the necessary infrastructure (Nel et al. 1998). Small-scale farmers lack resources (Joo & Kim 2004).

Small-scale farmers in South Africa reside in rural areas; they practice agriculture in order to improve their standard of living. In South Africa there is a high rate of unemployment. Like the commercial farmers, they want profit from their production, to generate income, to increase their well-being, in order to improve food security, and maintain sustainable environmental resources (Masiteng & van der Westhuizen 20001). Dunkhorst & Mollel (1999) emphasized that small-scale farmers should be helped to use limited resources more efficiently. According to Chompreeda & William (2002), peanuts provide a source of purchasing power to small-scale farmers, most of whom are women.

2.4.1 Allocation of land

The majority of small-scale farmers in rural areas use the communal land, which can only be allocated to them by traditional leaders, that is the Inkosi or Induna (Masiteng & van der Westhuizen 2001). According to the findings of their study small-scale farmers will only occupy the land after they have received permission from the Inkosi. Pieces of land used by the farmers are far from their homes, difficult to cultivate, small and marginal for farming. As a result, small-scale farmers are compelled to use several pieces of land to grow their crops, as

they do not have one piece of land large enough to grow crops for their families and for marketing purposes (Breth 1996). According to the literature, land holdings for small-scale farmers ranged from 0.25 ha to 5.25 ha (Duvël et al. 2003). The disparity in land allocation between commercial farms and communal farms results in loss of agricultural productivity potential and also the non-existent market value for communal land provides no security collateral leads to poor financial accessibility

2.4.2 Importance of Small-scale peanut produce

The shortage of food on the African continent is threatening the social stability of the continent. The population is expected to continue to increase in size, but the growth rate of agriculture does not keep pace with population growth (Rowland 1993).

Purchasing organizations or traders buy products from small-scale farmers for export and for the domestic market. Small-scale farmers sometimes produce crops that have inferior quality and are not fit for export. Access of small-scale farmers to the market is not restricted but the market is usually far from the small-scale farmers (Kostov & Lingard 2002). Peanuts are the most important crop for small-scale farmers in Southern Africa. Peanuts provide a source of purchasing power for small-scale farmers (Chrompreeda & William 1998).

2.4.3 Size of farm holdings

Small-scale farmers need a minimum of two ha to make a good profit (Simalenga et al. 2000). Crop production in West Africa is practised by small-scale farmers with little land and poor resources. The problems of these farmers are unfavourable environmental factors and a complicated land tenure system. Small-scale farmers use hand labour, while a few small-scale farmers use animal-drawn implements. They use low yield varieties and few inputs such as fertilizers. They lack cultivating tools, as they do not have the money to purchase the implements (Mwajwe et al. 2002). The small surplus produced by these farmers is not sufficient for the rising population (Rowland 1993). Small-scale land for crop production is between 0.25 ha and 5.25 ha (Düvel et al. 2003). Since most farmers own small pieces of land, it limits their farming activities, which ultimately reduces their profits.

For small-scale farmers to survive in the food industry they must combine the techniques and skills of working with retailers and food service companies to manage the supply chains, which are dominated by large companies who are most likely to implement a niche marketing strategy (Biocrawler 2005).

There is hope that small-scale farmers will survive and prosper in a commercial world that is dominated by monolithic (massive or undifferentiated) global retailers and manufacturers, but they require trading in niche markets. The closer a company is to its customers, the clearer the signals about the exact requirements of the customers. Bourlakis & Weightman (2004) research also showed that the fewer the links in the chain between farmers and customers, the higher the margin accruing (this is the gradual increase of money or interest over a period of time) to the manufacturers. The low cost of information and technology that is available to small firms enables them to be in line with large firms in their relationship with the supply chain or channel of distribution. Nevertheless small-scale firms dealing with major firms can be daunted, intimidated or discouraged (Bourlakis & Weightman 2004).

2.4.4 Transportation

Transport plays a critically important role in the marketing of agricultural crops. For this reason, extension staff should make sure that farmers or groups of farmers have the capacity to organize the transport that will deliver and assemble a farmer's products at a certain point at which it would be easy to be taken to the market. Farmers may use a contracted transport if possible or farmers can use their own transport or rent a vehicle to carry their products to the market (NDA & FAO 2001).

Once the crop has been harvested it must be moved to the storage place for further processing. Transporting products from the field to the house or market is one of the major problems that small-scale farmers face (Breth 1998). The transport can be any form that can be afforded by the small-scale farmers. Examples are donkeys, bakkies and taxis (NDA 2002& FAO 2001). Farmers in rural areas are widely dispersed and feeder roads are usually in poor condition, especially during rainy weather. The movement of produce is a major problem. Transportation to the market constraints are the quality of the network, the availability and adequacy of

transport and transport costs for produce. The lack of a road network compels farmers to transport their produce over long distances to the nearest road (AOFF 2003).

2.5. Processing

Peanuts contain a high percentage of fats and therefore peanuts are a good source of energy (Goeltenboth 1990). These fats are unsaturated. Peanuts contain about 47 to 50 percent oil. The oil composition of peanuts is an important factor in shelf storage and the onset of rancidity, which limits the keeping quality (Melouk & Shokes 1995). Refined peanut oil in the food industry is used for cooking, salad dressing and to make margarine (Rowland 1993). Small-scale farmers only manufacture peanut butter, as they lack the know-how to abstract oil. They also do not have the equipment for extracting oil from peanuts. Peanut butter, oil, roasted nuts and peanut sweets contain up to three percent added oil (Smartt 1994).

Processing is a unit operation or series of unit operations performed on a raw material to change its form or composition. Processing can be as simple as cleaning, grading and packing (Smartt 1994). It depends on the product to be made; peanuts may be subject to a number of operations, which can include picking, stripping, cleaning, storing, shelling, blanching, roasting, salting, grinding or extraction (Smartt 1994).

Axtell (2002) defined processing as the application of a scientific principle to the preservation or modification of foods to make them safe, appealing products with a uniformly high quality. Processing that only involves roasting before consumption is for snack food and for manufacturing peanut butter. Peanuts are first roasted and then ground to make peanut butter. Countries process peanuts to make peanut products. The protein-rich meal that remains after oil extraction is used as animal feed or fertilizer. This protein-rich meal has now been recognized as a valuable supplement for the human diet. Families process food every day when preparing a meal. In home processing any variation in quality is acceptable and no packaging is needed (Axtel 2002).

When processing for commercial purposes, the following differences are important:

The processor does not know who will eat the food, where or when the food will be prepared, or what the consumer will think about the food.

- Consumers who purchase processed food will expect to get the quality and the quantity they need.
- Consumers expect the weight of food in a package to be the same as is written on the label. Processed food should have a longer shelf life.
- When considering processing for income generation it is not only important to examine and understand the technical aspects of processing, but also aspects such as marketing, marketing research, packaging, quality assurance and business economics (Axtel 2002:1).

Food processing has two main aims: to provide healthy food throughout the year, which maintains health and is an enjoyable diet and to generate income for the producers. The increase in food processing has resulted from transferring activities which were once performed in the kitchen to factories. In many developed countries, people that are employed in food processing exceed those employed on farms (Grigg 1995:98).

2.5.1 Barriers for establishing food processing systems

The requirements for food processing are as follows:

Financial resources, availability of raw material and a market for the finished product (Mallik 2001).

The development of processing industries is hindered by:

- Lack of information on social and economic benefits.
- Lack of financial support and incentives.
- Uncertainties faced by the industries involved in processing, with regard to raw materials (Chrompreeda & Milliam 1998).
- Fluctuations in market demand and poor harvesting.
- Lack of research or development of varieties with high yields.
- Insufficient processing techniques, resulting in low yield and poor-quality products.
- Lack of local markets for primary processed products. Primary processing involves activities such as drying, shelling, grading and packaging. Small-scale farmers sell unshelled peanuts because they do not have peanut shelling equipment. According to a study done by Mhazo et al. (2003) in Zimbabwe, the primary equipment used by small-

scale farmers was limited to manual and motorized shellers. The majority of farmers that were using primary processing equipment were individual farmers or farmer groups and private contractors.

- Absence of trained personnel and equipment and lack of access to the latest technology. Poor communication between farmers, extension agents and researchers has often led to poorly targeted research or to poor adoption of promising options generated by research (IITA 2004).
- Market information and lack of research and development on the product and process development (Mallik 2001).

2.5.2 Peanut composition and uses

Peanuts are a good source of protein and oil in developing countries. Peanuts as a leguminous crop contain protein, but this protein does not have the same biological value or protein efficiency ratio as that of animal protein. Combining it with a cereal grain or other plant protein containing complementary amino acids would enhance its protein quality. Peanut protein could play an important role in human nutrition, as peanuts are considered an alternative non-animal source of protein for economic and health reasons (Smartt 1994) According to Holland et al. (1992) protein, carbohydrates, fat and vitamins.

Peanuts are particularly high in fat and should be eaten in moderation (Graimes 2002). It is an important source of protein and contains high fat (Ndunguru & Hildebrand 1994). Peanuts have a higher percentage of protein by weight than animal foods and the protein content ranges from 22-30 percent. Carbohydrates content of carbohydrate varies according to variety and growing conditions (Kiple & Ornelas 2001). The fat content of peanuts varies from 44 to 56 percent, depending on the cultivar. About 85 percent of fat in peanuts is unsaturated about a third is polyunsaturated and over half is mono-unsaturated

2.5.3 Processing peanuts and their products

Peanut oil

One or a combination of hydraulic pressing, expeller pressing or solvent extraction separates peanut oil from shelled and crushed peanuts (Mercola 2005). The meal that remains after oil extraction is used as an animal feed and is a good protein source in the human diet (Cooper

and Burton 2002). Lower quality peanuts are crushed to make peanut oil and peanut meal (Pooley 2006).

Peanut protein flour

After oil extraction, the next step in processing is flour making. The peanut flour contains protein concentrates and isolates. Peanut flour varies from full fat to defatted, with the protein level increasing as the fat level decreases. Peanut flour is obtained by grinding peanuts and is used as an abrasive, a bulking agent and a viscosity-increasing agent. The protein content of defatted peanut flour has been reported to range from 43.8 percent to 68.6 percent. Screw pressing or pre-pressing followed by solvent extraction are the two main methods of producing the defatted product (Smartt 1994, Anon 1993). High protein peanut flour is being used to supplement milk beverages in India and to raise the protein level of bread and biscuits, but not in significant quantities (Anon 1993).

Further processing of the meal to produce protein concentrates and isolates will remove insoluble and partly digestible carbohydrates, which make up one third of the raw material. Peanut protein isolates are the most refined form of peanut protein and further processing of the concentrate will lead to the removal of water-insoluble polysaccharides, water-soluble sugars and other minor constituents (Smartt 1994).

Roasted peanut snacks

Peanuts are first roasted before the production of snacks or sweets (Anon 1993). Roasted peanuts are available in several different packages and roasted varieties. Different coatings can be applied to the peanuts prior to and after roasting, to provide a variety of flavours including (honey, smoked, sweet, spicy and salted).

Peanut butter

Roasting, blanching and sorting peanuts before grinding them into a creamy consistency makes peanut butter. Peanut butter which is manufactured in the United States contains 90 percent peanuts, with sweeteners and salt added to enhance flavour (Anon 1993, Mercola 2005). Ingredients such as salt, hydrogenated fats, dextrose, glycerine, lecithin and

antioxidants are usually incorporated to improve flavour, prevent oil separation from the peanuts and to control rancidity (Smartt 1994). Small amounts of stabilizers (emulsifiers) are also used to prevent oil separation (FAO 2007). The small amount of stabilizer that is used does not contribute trans fatty acids to the products. Peanut` pieces are added to provide a crunchy texture (Mercola 2005).

If the peanut butter is less than 90 percent peanuts, or if flavours such as chocolate or vanilla has been used, or additional emulsifiers have been added, the product is not labelled as peanut butter but as a peanut spread (Smartt 1994). Peanut butter has become popular due to its healthy and nutritious status for all people, but especially for the aged because of dental and digestion problems and as a cholesterol-free source of protein, fibre, niacin and zinc and also because of its flavour.

Peanut protein flour is used to fortify low-protein foods or can be used to prepare a variety of food products without changing the colour, taste or texture of the traditional foods (Smartt 1994).

2.6 Marketing

Many people think of marketing only as selling and advertising. Marketing must be understood not in the old sense of making a sale, that is telling and selling, but in the sense of satisfying customers' needs (Armstrong & Kotler 1999). Marketing is one of the most powerful tools, which are used by organizations in their never-ending struggle for survival and growth (Dalrymple & Parsons 2000). The definition of marketing shows that the objective of marketing is to satisfy the needs and wants of customers and to make a profit (Dalrymple & Parsons 2000). Therefore the first challenge is to find customers and to identify their needs, so that an appropriate product can be developed. Once the organization has a product, marketing personnel design, price, promote and distribute so that the product reaches the customer at the right time and place, at an affordable price.

Perreault & McCarthy (2002) defined marketing as the way the organization or marketer or producer tries by all means to satisfy the needs of the customers and also to make a profit. Tony (1994:273) defined marketing as a process of planning and executing the concept, pricing, promotion and distribution of ideas, goods and services, to create exchanges that

satisfy the customers and organizational objectives. It is the duty of the marketing manager to decide on the right price that is affordable to the customers, before setting the price. It is important to consider the competition in the target market and the cost of the whole marketing mix when setting a price. The marketer must also test markups, discounts and sales in order to attract the target customers and new customers (Perreault & McCarthy 2002:484).

The market is made up of people with specific needs and the ability to satisfy their needs by purchasing the product they need. The marketer tries to make a profit, providing a quality product to satisfy some of these consumers' needs. Because it is difficult to satisfy all the consumers, the marketer must determine which consumers would be part of its market. The most effective way is to divide the market into segments. The marketer can then judge the consumers' needs and develop a product to satisfy those needs.

2.6.1 Market segmentation

Market segmentation will help the marketer to develop a product that will meet the needs of the consumers. Segmentation could be a management tool if the segment identified is measurable, sustainable and accessible and the business is capable of providing the product to the consumers in the right place and at the right time. Market segmentation helps the marketer to establish prices which the consumers are willing to pay, to identify the promotion to be used by selecting the media that are relevant to the target market and to identify the outlets used by the consumers and the reasons for shopping at a specific outlet (Srydom 1998:63).

Storage forms part of the marketing strategy that farmers need to follow. Peanuts can be stored on the farm if storage facilities are available or can be stored at a co-operative. When the price of peanuts is low in the cash market, farmers should store their peanuts to sell at a later stage when the price of peanuts is higher (NDA & FAO 2001).

2.6.2 Packaging

An alternative to changing the product itself is changing its packaging, for example instead of using glass bottles for peanut butter more manufacturers are using plastic bottles (Wells & Prensky 1996). Plastic bottles are more durable and safer to use, as if the bottle falls it will not break like a glass bottle. It is cheaper than a glass bottle (Axtell 2002:20). Proper packaging is the main means of reducing oxidation (Gale 2006).

Foods with longer expected shelf life require more sophisticated packaging, to protect the products from air, light, moisture, crushing, insects and micro-organisms.

The main aims of packaging are:

- to keep foods in good condition until they are consumed.
- to encourage customers to purchase the product.
- to extend the shelf life of the food and food will be easier to distribute to more distance markets without being spoiled.
- to attract customers to buy the product, in preference to a competitor's brand, and can develop an image of quality.
- to provide the barrier against dirt, micro-organisms and other contamination so that the food will remain clean.

When products are packaged for storage and distribution, various checks should take place. These include checking the weight, ensuring that the product is the right weight. Metal detection ensures that there are no metal objects in the finished product. The package carries information for consumers, such as nutritional content, address, phone number and expiry date. It also enhances the appeal of the product and encourages the consumer to buy the products (Curtis1994).

2.6.3 The communication function

The package communicates a company image through its design, label, colour, brand and display. Communication functions include information, identification, quantity and nutritional value of the content and also attractiveness. In agricultural products, the package is the only element that allows the customer or consumer to distinguish among different production origins or marketers. When the consumer or middleman is looking at the core of the product, they can recognize and identify the origin to exercise their preferences and brand loyalty (Padberg 1997:286).

2.6.4 Price

Price is what the customers exchange with the marketer in order to purchase the product (Wells & Prenskey 1996). Price is the marketing tool that generates an income for the business. Peanut prices are more predictable than those of other crops such as maize. Peanut producers had favourable prices in the past. Small-scale farmers, like commercial farmers, are affected by changing prices, whether they are producing only for consumption. In Senegal the price of peanuts from the farm and that of unshelled peanuts has risen more than that of the retail prices and for shelled peanuts (International Food Policy Research Institute (IFPRI) (1997).

Prices of agricultural commodities are important to determine the level of farm income, the cost of food to consumers, export income for countries which are involved in commodity trade, the profit for agricultural marketing firms and the return to commodity traders and speculators. As the agricultural commodities prices are so important for economic growth and development, national government usually has extensive and complex policies and programmes to control commodity prices for both the domestic and the export market (Padberg 1997).

2.6.5 Price movement

The price of peanuts is usually low during harvesting but increases as the season progresses. Many farmers sell their peanuts during harvesting in their fields to raise cash. Large traders know that the price of peanuts may go up and they buy peanuts from small-scale farmers cheaply at the beginning of the season and store the peanuts until the price increases so that they can sell their peanuts at a profit (NDA & FAO 2001).

2.6.6 Supply and demand

Although the world field crop prices determine the South African price, the domestic supply and demand price is approaching the export and import parity price. When the price of the product increases, the demand for the product will decrease and the supply will increase. The price of the product is determined by the interaction of the forces of supply and demand, where the intentions of the buyers match those of the supplier (Murphy 1996).

2.6.7 Factors influencing price constraints

Prices are set according to individual products on the basis of their production cost, what the competitors are charging and what the customers are prepared to pay (Palmer 2000). The stage of the products' life-cycle influences the price. If the price is in the introductory stage of its life-cycle, with little or no competition, the organization is in a better position to set the price that will recover costs and earn a profit (Strydom 1998:174).

2.6.8 Commodity prices through time

Farmers and processors who are involved in marketing are concerned about the movement of product prices over time. Producers or farmers and processors and middlemen should make the decision related to production, storage, purchasing and timing of marketing (Padberg et al. 1997:57). The businesses that store large quantities of the product should evaluate the risk of price changes over time and look for strategies for hedging (to reduce risk of loss). Price changes over time may be classified as:

- Long-term price trends due to changing supply and demand or macro-economic factors such as inflation.
- Seasonal price movements, which are caused by regular seasonal changes in supply and demand which are repeated each year.
- Cyclical price movement, which occurs over several years.
- Year-to-year and irregular price changes (Padberg et al. 1997).

2.6.9 Seasonal price changes

The prices of agricultural products are predictable, because of seasonal variations in supply and demand. The harvesting time often extends over one, two or three months, but consumption is all year round, provided the producers have stock in their storage. This pattern of production and storage is only experienced with grains and oilseeds, including peanuts, have the lowest prices during harvesting time and high prices due to charges for storage over the rest of the year (Padberg et al. 1997:57).

2.6.10 Price cycle

A price cycle is a pattern of prices that repeats itself regularly over time, usually in response to a production cycle. Due to the close relationship between price and quantity, expressed by the law of supply and demand, high prices are associated with low production and low prices with high production. Production and the price cycle are described as follows:

- High prices encourage producers to expand their production, but the expansion will take time because of the lag involved in producing a certain crop if it is not stored
- High prices continue until new production begins from the capital stock; the prices decrease until it is no longer profitable to invest in new capacity (Padberg et al.1997)

Customers consider the price to be the most important criterion when evaluating the alternatives before and after making the purchase of any product (Wells & Prenskey 1996:92). According to Palmer (2000:22), pricing is the critical element of most company's marketing mix, because it determined the revenue generated. If the price of the product is set too high, the company may not achieve its sale volume targets. If the company sets the price of the product too low, volume targets may be achieved without gaining any profit, which is very important for a company to be sustainable.

2.6.11 Price of substitutes

The price of the product, including peanuts, is determined by the quantity that is demanded by the customers or consumers. Consumers could switch their demand between different products. If the price of peanut butter increased due to a shortage of peanuts, consumers would rather buy other spreads such as margarine or jam instead of peanut butter. The demand for most agricultural products or commodities is relatively price inelastic. This means that the demand for a product does not change very much in response to price changes (NDA & FAO 2001).

2.6.12 Promotion

Promotion is the way the marketer communicates information and the consumer uses to ascertain a product positioning. According to Palmer (2000:23), promotion tools include advertising, personal selling, public relations, sale promotion, sponsorship and direct marketing. The consumers use the information provided by advertising, direct marketing

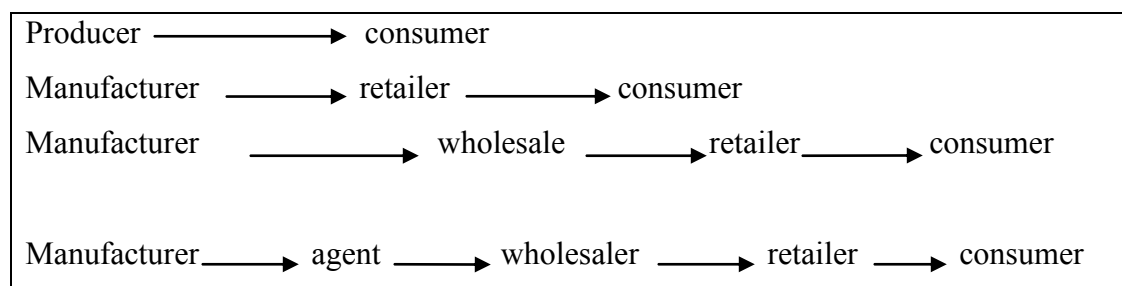
public relations and sales-people to learn about the product design, its price, where it is sold and whether or not it is appropriate for them (Wells & Prenskey 1996). Promotion helps to increase sales per customer and the number of clients and to enhance the image and visibility of the farm and the product. Small-scale farmers use word-of-mouth and road signs to promote their products (Adam *et al.* 1999).

2.6.13 Distribution systems of peanut products.

Distribution has two broad activities firstly,

Transaction flow -suitable channels should be used to make the product available to consumers at the right time and right quantity. For example, Clover uses supermarkets, wholesalers, cafes, trading stores and convenience shops as distribution outlets, to make its products available to consumers (Strydom 1998). Secondly small-scale farmers can use more channels to sell products to their customers or consumers. The first channel is a direct channel, as the manufacturer markets directly to the final consumer, for example if the consumer buys from a farm stall (Strydom 1998). The second channel is called a two-link channel. This channel of distribution is widely used in South Africa, for example supermarkets like Shoprite, Checkers and Pick 'n Pay sell directly to the consumers. Direct marketing has become more important. Supermarkets such as OK, Spar have direct contact with small-scale farmers. The following are possibilities (Strydom 2002):

Table 2.2: Distribution channels



2.6.14 Basic distribution channels for consumer products (Strydom 2002)

In establishing market linkages, it is very important that the role players, namely retailers, farmers and intermediaries (where relevant), are clearly defined; and will be understood by all partners so that each player has a realistic expectation of each other's role (Golob *et al.* 2002).

Marketing effectiveness is affected by the actions of the front-line that is employees who interact with the customers (Palmer 2000:23). The customer can be deeply affected in any business by the manner in which the staff provides the service to customers. Marketers should work closely with the employers. Managers should provide training skills in handling the customers. This training must both be cost efficient and effective in satisfying the customers' needs (Palmer 2000).

2.7 Market outlets for small-scale farmers

The output from the chain is largely determined by the requirement of the supply chains, such as quantity, quality, consistency, food safety and ethical trade, who are, in return, responsive to the demands of the consumers and the obligation plan by government (AOFF 2003). Small-scale farmers have little business experience, are not well organized, lack information on technology, markets, and pricing skills, upon which to plan market-oriented production systems. They receive little support in terms of technical advice (African Organic Farming Foundation 2003). Small-scale farmers do not have the ability to meet the requirements of the market in terms of price, quality, product standards (grading and sorting), technical requirements and sales in terms of the timelines of delivery and production management (NDA & FAO 2001). Small-scale farmer outlets are local (CRSP (Collaborate Research Support Programs 2001). In rural markets, trade is characterized by the direct sale of small quantities of the product by small-scale farmers to local traders (Golob 2002). Small-scale farmers sell a proportion of their product at low price straight after harvesting, as they need cash. Marketing by small-scale farmers was found to be largely informal (Duvël & Stephanuas 2000). They relied on demand from local informal markets, which are small and unreliable. Demand is erratic and seasonal. A study done in Zimbabwe showed that small-scale farmers lacked marketing skills and information (Mhazo 2003).

2.8 Linkage of small-scale farmers with supply chains

There are limitations to the development of agribusiness linkages at all levels in the economy, macroeconomic and environmental aspects in managing sectoral policies in public-private relationships in regional conditions and in organizational and microeconomic aspects. Small-scale farmers do not benefit from basic research. There is a lack of active interaction that

should establish synergy (co-operation) between the public and private sectors for the benefit of small-scale farmers. According to literature, small-scale farmers have a relatively weak position in negotiations with processors and marketing agents, as they have limited market information and are poorly organized (Baker 2000). Small-scale farmers are limited in their negotiation abilities with agents, retailers, larger processors and international dealers, who have better capabilities and greater economic power (Anon 2005). Poor linkage between farmers, processors, development agents, traders and researchers prevent the adoption of improved agricultural technology (IITA 2004). Informal traders purchase peanuts directly from the farmers (IFPRI 1997).

2.9 Conclusion

Peanuts are an excellent crop for small-scale farmers. There are numerous opportunities for value adding, namely roasting, shelling, making sweets and peanut butter. There is also an opportunity for contracts to produce high quality for export. Peanuts are a good source of both oil and protein in developed countries and they are grown mainly for oil. Peanuts are a leguminous crop. When combined with other legumes, they contribute nine percent of the total food crops grown in developing countries and are the major source of dietary protein for about 700 million people. Peanuts contain all the amino acids, but three are limiting (lysine, methionine and threonine). Peanut crops therefore play a significant role in contributing towards achieving food security. Peanuts provide nutrients for the body because of their high protein, fats and carbohydrates content. Peanuts as a cash crop mean additional income for farmers. Money earned from selling peanuts can be used to purchase other food items and to finance family needs and production assets such as inputs (Nel et al. 1998).

Research has shown that there are a number of factors that may constrain small-scale processors from manufacturing and processing their food effectively. The constraints that are faced by small-scale farmers are as follows (Hart 2003; Hedden-Dunkhorst & Mollel 1999; Masiteng & van der Westuizen 1999):

- Policies that are implemented by governments have served to hinder the development of small-scale industries. Small-scale farmers have limited access to credit.

- They lack appropriate technology, have an unreliable supply of raw materials and they lack management know-how.
- Their products are of a poor quality and they find it difficult to compete with large-scale farmers in the market.

The marketer should decide how she or he is going to persuade the consumers to buy the products (Blyte 1998). The marketer or small-scale farmer should have a product that satisfies the needs of the consumers. The elements of the product that the producer can control include quality, style, special design of the packaging and the brand image. It should be readily available to the consumers (Stanton 1994). Prices that competitors charge are usually a determining factor in setting a price. Consumers usually consider the price as an important criterion in their evaluation before and after making a purchase. It is important for small-scale farmers to inform their current and their potential customers in the marketplace about products. Using marketing communication tools such as advertising, sale promotion, personal selling or word of mouth can facilitate this communication. Farmers should decide on the type of distribution channel through which they wish deliver the product to the consumers (Blyte 1998).

Small-scale food processing can be a potential source of livelihood for the poorest people in African countries. Peanut processing may increase the value of peanuts to poor, small-scale farmers, yielding higher returns, expanding marketing opportunities, improving shelf life and overcoming seasonal limitations and perishability of the product. The adoption of improved and up-to-date processing technology and good standards of quality and hygiene may help small-scale farmers to produce peanuts and overcome some of the problems encountered. These include aflatoxin contamination, shortage of raw peanuts, lack of market information and reliance on spot market and transport constraints.

CHAPTER 3: METHODOLOGY

3.0 Introduction

A survey was conducted with the assumption that small-scale farmers would have market opportunities if their peanuts met market requirements. The survey was based on the assumption that marketing of processed peanuts could improve the income of the small-scale farmers and create job opportunities in the Vulamehlo District, KZN.

The main objective of the study was to investigate the market strategies needed for the development of peanut agribusiness for the small-scale farmers producing peanuts in the Vulamehlo District, southern KZN. The aim of the study was to examine the market requirements for peanuts purchased from Vulamehlo farmers, in relation to further processing and the sale of raw peanuts. The other purpose was to find out whether market outlets for peanut products in KZN were available and whether investigation of current links between farmers, agents, peanut processors and retailers would improve the marketing of peanut butter produced by the small-scale farmers of Vulamehlo.

The study focused only on small-scale farmers producing peanuts in the Vulamehlo District because this is the only District of Ugu Municipality that produces significant quantities of peanuts and the peanut butter processing plant is situated in one of the Vulamehlo wards, Mkhunya ward. Transaction costs will be lower if the peanut butter manufacturing co-operative purchased raw peanuts from other small-scale farmers within the Vulamehlo District. Small-scale farmers producing peanuts were targeted, because small-scale farmers play a vital role in rural areas for community development, for poverty alleviation and to generate income (Agricultural Policy in South Africa 1998; ITDG 2005).

Research has shown that consumers have a negative attitude to products that are manufactured by the small-scale farmer. Consumers perceive a small-scale farmer's products as unhygienic and adulterated (NDA & FAO 2001). Lack of access to information about relevant technologies is also a barrier. Most research into food technology in the world favours medium and large-scale processors. There is little research on small-scale processing. Small-scale farmers have therefore unreliable markets. There is a widespread lack of skills, as the majority of small-scale farmers that are involved in processing are poor and marginalized

women and men. To improve their livelihoods through agribusiness, they require technical, business management and marketing skills.

Agribusiness can reduce wastage by processing excess product and enhance food security, as processed food can be available the whole year round if properly processed and stored. The value of this study is that the KZNDAEA could provide proper training for its extension service and conduct appropriate research on agribusiness, especially in peanuts, as peanuts are an important cash crop for small-scale farmers and a source of protein in developing countries. If the KZNDAEA does not provide proper training to small-scale farmers on the production and processing of peanuts, the peanut industry will be affected.

The elimination of aflatoxin contamination is a high priority for small-scale farmers in the peanut industry because of human health concerns. Proper post-harvest handling, that includes proper drying, selection of damaged peanuts and appropriate storage, could reduce the level of aflatoxin

The only peanut butter making co-operative in the area was included; five informal traders were interviewed, the manager of the only commercial peanut butter production company in KZN (near Pietermaritzburg), was interviewed to find out where they obtained the raw peanuts from, what their expectations regarding the quantity and size range for purchasing their peanut inputs were, who their customers were, what peanut products they sold and how they solved the problem of aflatoxins. Six formal commercial traders were also selected for interviews.

3.1 Description of the area

Vulamehlo was selected for this study because it had a high level of poverty, with a vast backlog of basic services and low skill abilities because of inadequate levels of education and training. A large proportion of the population is very poor, with high unemployment rates and limited, irregular household income. It reflected a good potential for improved income generation and value adding processing from agricultural produce.

The projected population of Vulamehlo is 86 399 over an extensive area (Vulamehlo Integrated Plan 2006). Vulamehlo municipality is one of the six local municipalities that form

part of the Ugu District Municipality (DC 21) located on the south coast of KZN. Neighbouring municipalities include Umzumbe to the south, Umdoni to the east, Durban and Umkhambathini municipalities to the north and Ixopo to the west.

The Vulamehlo district is a communal land area situated on the south coast of KZN near Scottburgh and approximately 48 kilometres from Durban. The Vulamehlo district is made up largely of traditional areas under the Vulamehlo house of traditional leadership and includes the Izimpethu, Zendlovu, Mandleni, Mbele, Amanyuswa, Qiko, Zembeni, Ukuthula, Thonyana, Maphumulo and Isimahla clans. Vulamehlo comprises traditional areas, which are under traditional leaders and form part of Umbumbulu. These tribal authorities are Thoyana, Maphumulo and Isimahla. Some of the traditional settlements in the northern parts of Vulamehlo relate better to eThekwinini than to the Vulamehlo municipality; the Umkomazi River separates these settlements from the rest of the municipality (Agricultural Development Plan Inception Report 2006).

Administrative and social services (government departments) such as Welfare, Agriculture and Environmental Affairs, Justice Department and the police station are located in one of the Vulamehlo villages, namely Dududu. Dududu valley is approximately 65 km from Durban and 20 km from Scottburgh. Dududu village is not easily accessible to the community of the Vulamehlo within the municipality because of the poor level of public transport. Employment centres are located at some distance from the municipality (close to the coast) such as Umzinto, Scottburgh, Port Shepstone and Durban. Apart from Scottburgh, the nearest town to Vulamehlo is Umzinto. Umzinto is the closest town to most wards of Vulamehlo.

Umzinto has six supermarkets, three banks (ABSA, First National and Standard), Cash 'n Carry, butcheries, a prison, a Post Office, Umzinto High School and Primary School and four petrol filling stations. There are many informal businesses that sell fruit and vegetables and meals at the Umzinto taxi rank. There are also hawkers that sell fruit and vegetables in Umzinto at street corners (Vulamehlo Integrated Plan 2006).

There is a little privately owned land, scattered throughout the municipality. The dispersed, low-density settlement pattern makes the provision of physical and social infrastructure such

as roads, water, electricity, clinics, schools and police stations expensive to install, maintain and operate. The resulting constraints on small-scale farmers make income generation difficult.

Traditional settlement areas are the predominant development type in Vulamehlo. This type of settlement includes a range of densities, from peri-urban to sparse rural settlements. Vulamehlo is mainly occupied for commercial farming purposes. This land is mostly used for monoculture in the form of timber plantations and sugar cane production. Major corporate and individual landowners are the main stakeholders for timber and sugar cane production. Small growers for sugar cane and timber are well established at Ingonyama Trust Land, which is 31 km from the Vulamehlo District and 15 km from the peanut butter co-operative. Agricultural activities that are practised on the Ingonyama Trust Land are of a subsistence nature and although this fulfils a major role in terms of poverty alleviation and nutrition, it has a limited impact on the economy of Vulamehlo. The sugar cane and timber produced in Vulamehlo are processed at Illovo and Sezela processing mills that are located outside Vulamehlo. Agribusiness activities are limited and no major facilities could be identified (IDP 2006).

Small-scale farmers in Vulamehlo experience numerous constraints such as lack of water and destruction of crops by livestock, as the fields of the communities are not fenced, except for community gardens (ADPIR 2006). The communities of Vulamehlo are reliant on state grants. Markets for sugar and timber are well established. Due to its location, Vulamehlo has the potential to link with a wide range of markets of fresh produce, including both Ugu and eThekweni fresh produce markets.

Peanut production in Vulamehlo is good because of its sandy soils. Annual rainfall in Vulamehlo is between 500mm and 900mm. Peanuts in Vulamehlo are planted between October and November, when daytime temperatures are between 25°C and 30°C, which is the climate needed by peanuts. The available land used by Vulamehlo farmers tends to be in community gardens; therefore little labour is needed, as each individual farmer is allocated only 0.15 ha. The decision to investigate peanuts, with the potential for income generation and processing for profit, seemed appropriate.

All farmers interviewed were members of the farmers' associations in the area. Farmers interviewed used community gardens which were divided into plots (0.15 ha plots) and were using hand hoes for the entire production of any agricultural crops. All the community gardens were fenced and had irrigation scheme infrastructure provided by the KZNDAEA.

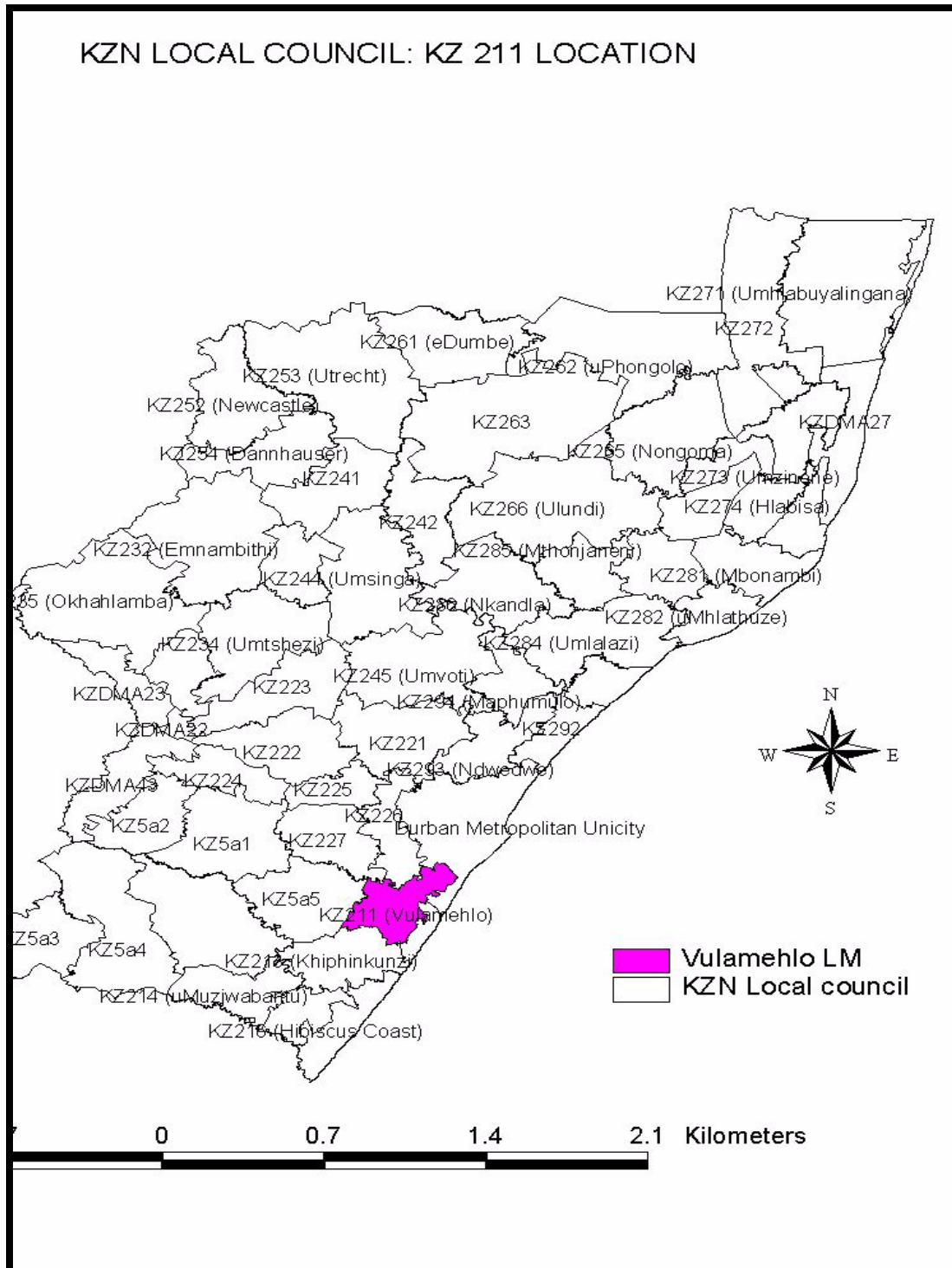


Figure 3.1: Map of KwaZulu-Natal, KZN Local Council (Natural Resources, Cedara 2006)

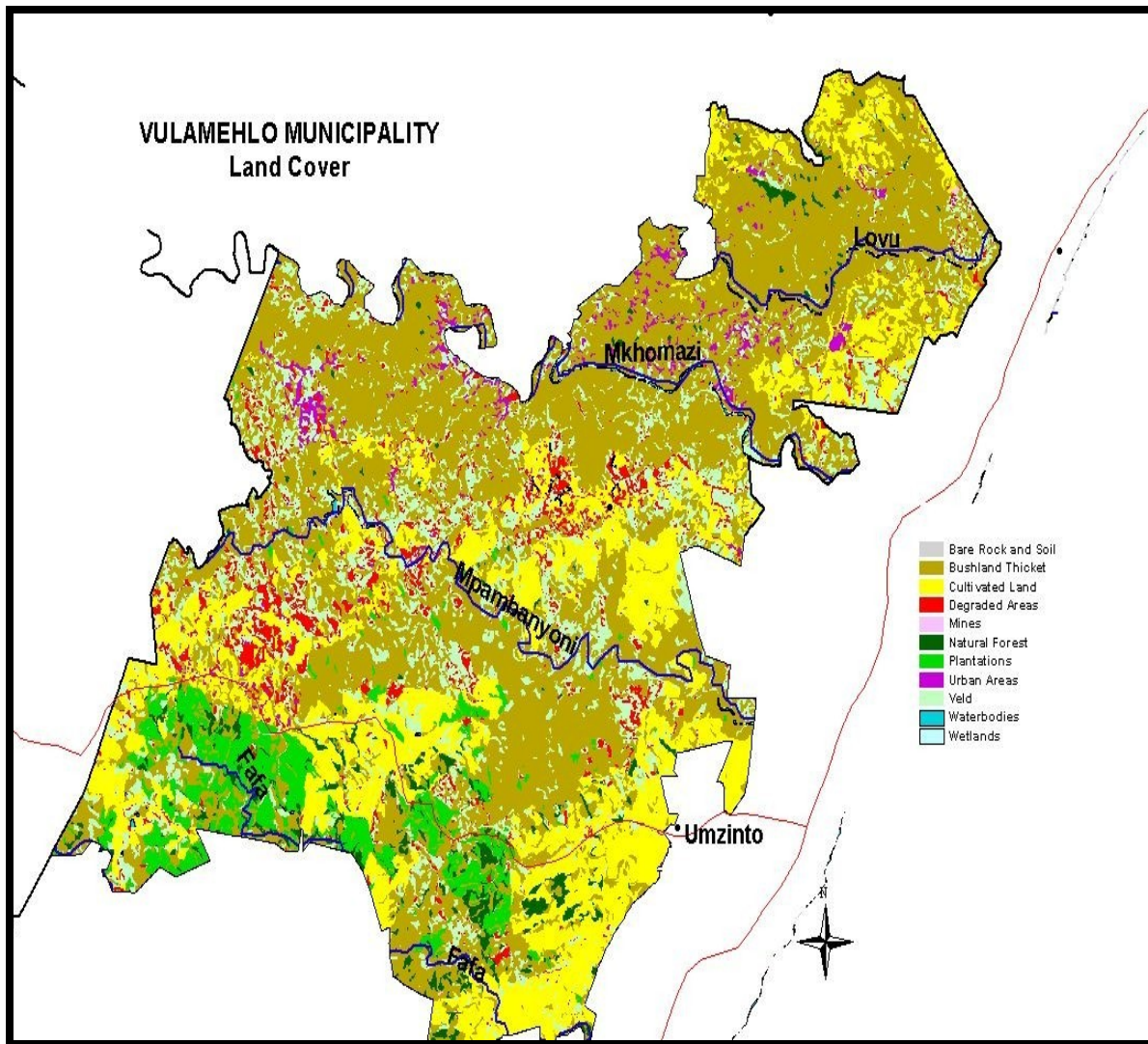


Figure 3.2: Map of Vulamehlo Municipality (Cedara natural Resources, 2007)

3.2 Methodology

Six peanut producing farmers' associations out of 10 farmers' associations in the district were randomly selected from the list of farmers' associations in the Vulamehlo district. The list was obtained from the local Department of Agriculture offices. Not all 10 farmers' associations could be selected due to the lack of time and the expense involved. Six farmers from each peanut producing association (from an average of 10 to 12 members in each) were randomly selected from membership lists for interviews to determine the capacity of the farmers to produce sufficient peanuts of the correct quality for processing in various ways.

The only peanut butter making co-operative in the area was included; five informal traders were interviewed, the manager of the only commercial peanut butter production company in KZN (near Pietermaritzburg), was interviewed to find out where they obtained the raw peanuts from, what their expectations regarding the quantity and size range for purchasing their peanut inputs were, who their customers were, what peanut products they sold and how they solved the problem of aflatoxins. Six formal commercial traders were also selected for interviews.

3.3 Design of the study

In order to investigate future marketing strategies for the development of peanut agribusinesses in Vulamehlo, black small-scale farmers producing peanuts, informal and formal traders and a commercial peanut processor were interviewed. A survey amongst the small-scale farmers and the traders was conducted, using questionnaires. Qualitative data was obtained from the co-operative members in an in-depth focus group discussion. The only commercial peanut butter processor in KZN was interviewed as a case study against which the peanut co-operative potential could be assessed.

3.4 Sampling

Six peanut producing farmers' associations out of 10 farmers' associations in the district were randomly selected from the list of farmers' associations in the Vulamehlo district, obtained from the local KZNDAEA office (see appendix A). The KZNDAEA officers worked intimately with all the farmers in the area and had a thorough understanding of the agricultural activities in the area. Six farmers' associations were randomly selected from ten (in spite of all being peanut producers) because of lack of time and the expense involved. Such cluster sampling is less expensive (Neuman 1997).

Six farmers from each peanut producing association (from an average of 10 to 12 members in each) were randomly selected from membership lists for interviews to determine the capacity of the farmers to produce sufficient peanuts of the required quality for processing in various ways. The researcher randomly selected the clusters and all selected members of the farmers' association clusters were willing to participate in the study and were included in the sample (Fink 2003; Miller & Brewer 2003; Seale 2004).

The only peanut butter making co-operative in the area was included because it was the first project for black small-scale farmers in KZN that made peanut butter. Out of 24 members, six co-operative members were selected for a focus group discussion. A convenient sample consists of a group who are readily available to participate in the study. Shopping malls are an example of convenience sampling is one that is usually done by researchers in shopping malls (Bickman & Rog 1998; Fink 2003). Only six members were selected because other members were busy planting their crops. November was the peanut-planting month and those actually making peanut butter were available to participate in the study, while other members were busy in the fields.

In addition, five informal traders were interviewed to determine where they bought raw peanuts and what type of peanut products they sold, who their customers were and the requirements they set for the peanuts (See Appendix D). There were few informal traders involved in selling peanut products in the Vulamehlo area and all were interviewed. All informal traders were also willing to provide the necessary information. Purposive sampling is an acceptable form of sampling for a special situation. The researcher used purposive sampling to select unique cases of informal traders selling peanut products, as they were especially informative.

Formal commercial traders were also selected for interviews (See Appendix D). Six shop-owners out of seven shop-owners in the Vulamehlo district were interviewed to find out what type of peanut products they sold, who their customers were and which peanut product brands were available in their shelf. These traders were selected because they sold peanut products, were in Vulamehlo in close proximity to the farmers and were large chain stores. Only six of the traders present in the area and fulfilling these criteria were willing to participate in the survey and formed this sample. This was purposive sampling to meet the researcher's criteria (Neuman 1997).

The manager of the only commercial peanut butter production company in KZN (near Pietermaritzburg) was interviewed to determine the following: where they obtained the raw peanuts, what their expectations regarding the quantity and size range for purchasing their peanut inputs were, who their customers were, what peanut products they sold and how they solved the problem of aflatoxin.

3.5 Data collection tools

The data collection tools used included questionnaires, a focus group discussion and informal observation. Questionnaires were used to collect information from the farmers, informal and formal traders, commercial stores and the commercial peanut processing plant; while a focus group discussion was held with the members of the co-operative producing peanut butter. Generally, informal observations sought to confirm data collected more formally.

3.5.1 Questionnaire

According to de Vos (2000:152), a questionnaire is a set of questions on a form which is to be completed by the respondents in respect of a research project. The main aim of using questionnaires with the participants concerned is to get wide-ranging facts and opinions about the research topic. It is a quick and relatively inexpensive method of collecting a large amount of data. As recommended by Leedy (2005), the questionnaires were administered face-to-face, so that rapport with the participants was readily established and their co-operation assured. A questionnaire was generally handed to the participants who completed them on their own. As the majority of the small-scale farmers could not write and read, the researcher asked the participants the questions and wrote down what was said by them. The open-ended questions that were asked from the farmers related to the following: production, harvesting, storage, pricing, packaging, distribution and marketing by peanut producing farmers.

Questionnaires were used to provide descriptive data of small-scale farmers' personal details such as name, age, gender, educational level, household size and position held by members in the farmers' associations. The questionnaire included the details of peanut production to measure the quantity and quality of peanuts that they produced for marketing purposes, whether for processing or for selling in a raw state; packaging that they used for storage and for selling purposes, whether they kept the seed for the next season or bought the peanut seed

for the next planting season. Other information included their storage facilities and marketing activities (See Appendix B).

Other questionnaires were for focus group members to determine their personal details, while other questionnaires were to collect data from traders and the commercial processor regarding where their sources of raw peanuts were and who their customers were, their marketing outlets and what peanut products they sold.

The first part of the questionnaire covered the personal details of the farmers. Part two of the questionnaire determined details of peanut production (See Appendix B). The third part of the questionnaire included data for focus group discussion for more information concerning where the co-operative members obtained their raw peanuts to make peanut butter. The fourth part of the questionnaire solicited information on peanut butter marketing. The fifth part of the questionnaire was for traders and lastly questions relating to the only commercial processor.

All the traders' questionnaires were administered orally, as variations in the literacy levels were wide. For the formal traders, informal observations of shelf layouts were used to initiate conversation, as suggested by Leedy (2005).

3.5.2 Focus group discussions

De Vos (2000:314) defined a focus group as a purposive discussion of a specific topic taking place among eight to ten participants or individuals with a similar background and common interests. The focus group data collection technique was chosen because the participants could make their own comments, ask questions and could include the comments of the moderator.

According to de Vos (2000) focus group discussion is important because it generates data regarding people and consumer perceptions of a phenomenon, product or service. People have more knowledge about their product than the researcher. For example, farmers of Vulamehlo will already know when to plant their peanuts and where to market their products (to some extent).

The size of a focus group is from six to twelve, but the ideal size is six to nine participants; recommended because it is easier to recruit and control (de Vos 2000). The researcher chose six farmers in the peanut butter co-operative for a focus group discussion. The researcher has used a combination of open-ended questions and closed ended questions. To get more information from the participants concerning the product and marketing the researcher used open-ended questions (See Appendix B). The researcher used the group facilitation team technique for the focus group discussion. The group facilitation team consisted of a facilitator and an assistant facilitator. The task of the facilitator was to direct the discussion and keeping the conversation flowing. The assistant facilitator assisted the facilitator in handling distractions and acted as a back-up to control environmental conditions and logistics. Prioritizing suggestions made to improve the functioning and marketing of the various products were included as part of the focus group discussion with members of the co-operative.

3.5.3 Informal observation

May (1998) defined observation as a process in which an investigator or a researcher established many sided and relatively long-term relationships with a human association in a natural setting, for the purpose of developing a scientific understanding of that association. Observation is associated with a qualitative research procedure that studies the natural and everyday set-up in a particular community or situation (de Vos et al. 2002; May 1998). In observation methodology, the researcher observes both human activities and the physical settings in which such activities take place (Fink 2003). Observation gives a comprehensive perspective on the problem under investigation. It can be considered for the study if the problem being investigated can be confined to a specific geographical area. The researcher made notes that were written up at the first available opportunity, as recommended by de Vos et al. (2002). Observation relies on observing the participant's behaviour and attitudes, the physical situation where the study took place and the taking of notes.

Various data collection techniques could be used such as an open-ended narrative, checklists, and field guides and interviews (de Vos et al. 2002). In the present study, the researcher observed informally to inspect the farmers' financial records, the co-operative records and the stock books. The researcher recorded observations during data collection (completion of

questionnaires and during focal group discussions) and also assessed the situation of the farmers' associations and co-operative members. Scrutiny enabled the researcher to make judgments based on her observations about the nature and the cleanliness of the processing plant, record keeping and availability of equipment for processing.

3.6 Analysis of data

The qualitative data (from focus group discussions and observation) were written down and analyzed according to themes and similarities as suggested by Leedy 2005 and Neuman 1997.

All quantitative information was coded and entered into tables. Analysis for frequencies, percentages and correlations were obtained using SPSS version 13. Samples were too small for further non-parametric analysis of quantitative data. It was difficult for the researcher to reach other peanut-producing farmers as they were not receiving extension services from the KNZDAEA.

The next chapter will present the results of the demographics survey of farmers producing peanuts, for both individual farmers and co-operative members. Peanut production and marketing, processing and marketing of peanut butter will be discussed. The results from the co-operative members will be provided in connection with sourcing of raw peanuts, processing of peanut butter, processing equipment, transport and marketing of their peanut butter. Results of informal traders, formal traders and a formal processor will be presented.

CHAPTER 4: RESULTS AND DISCUSSION

Peanut producing farmers, peanut butter processors and informal and formal traders provided information for this section of the study. The results are presented in relation to the demographics of the participants, peanut production, processing and marketing in Vulamehlo.

4.1 Demographics of the sample of peanut producing farmers

This section will present the demographics of the farmers (gender, age, educational level, household size, income and position in the association) who participated in the study. The information will assist in understanding the background against which the study was conducted in the community of the Vulamehlo District. It will be presented as comparative data between the individual farmers and the members of the co-operative.

All farmers interviewed were members of the farmers' associations in the area. Forty-two individual peanut producing farmers were interviewed. Six of these farmers represented the co-operative where they participated in a focus group discussion to obtain more information. Amongst the individual farmers were six males and two different males in the focus group discussion. Men made up eleven percent of the total sample and so there were many more women involved in peanut agriculture than men (See Table 4.1).

Table 4.1: Gender composition of the peanut producing farmers (n=42)

Individual	Frequency	Percentage
Males	4	11.1
Females	32	88.8
Total	36	100
Co-operative	Frequency	Percentage
Males	2	33.3
Females	4	66.7
Total	6	100

Individual farmer's ages ranged from 28-63 years (see Table 4.2). Twelve members from the total sample were younger than 40 and 12 were older than 50 years. The mode for individual farmers was 41-50 years old. The co-operative members tended to be younger. All co-operative members were between 31 and 40 years and only one member was 48 years old.

The average ages of the two groups (calculated according to the mid-point of the categories) were 47.2 years for individual farmers and 37.5 years for co-operative members.

Table 4.2 Age distributions of all peanut producing farmers (n= 42)

Individual farmers		
Age	Frequency	Percentage
30 and under	2	5.6
31-40	5	14.0
41-50	17	47.6
51-60	7	19.6
61 and above	5	13.9
Total	36	100.0
Co-operative		
Age	Frequency	Percentage
31-40	5	83.4
41-50	1	16.7
Total	6	100.0

As the individual farmers were mostly older, they had vast experience concerning peanut production, from planting to harvesting and for the storage of peanuts. The younger farmers would probably be able to learn from the older farmers.

Table 4.3: Household sizes of farmers (individual and group) (n=42)

Individual farmers		
Household size	Frequency	Percentage
1-5	10	27.8
6-10	16	44.6
11-15	9	25.0
16-20	1	2.8
Total	36	100.0
Co-operative		
1-5	2	33.4
6-10	2	33.4
6-15	1	16.7
16-20	1	16.7
Total	6	100.0

The household size for individual farmers was between two and nineteen members. The average size of the households was eight members. There were more individual farmers with households of six and ten members (See Table 4.3). The co-operative household sizes ranged from four members to 19 members. Co-operative peanut producing farmers were still young

and were staying with their parents and their siblings. The largest household group (mode) was six to ten members in both groups. There was no difference, then, in the household sizes of individual and co-operative farmers.

Table 4.4: Monthly incomes of peanut producing farmers, including grants (n=42)

Income (Rands)	Frequency	Percentage
Individual farmers		
No income	4	11.1
R100-R500	7	19.6
R501-R1000	12	33.5
R1001-R1500	5	14.0
R1501-R3000	5	14.0
R3001-R5000	1	2.8
R5001-R15000	1	2.8
Total	36	100.0
Co-operative Members		
R500-R1000	5	83.4
R1001-R1500	1	16.7
Total	6	100.0

For individual farmers producing peanuts, the average monthly income varied between R0.00 and R15000. Most of the farmers received grants, (pension and child grants) as their grandchildren were staying with them (See Table 4.4). There was only one woman with a R15000 monthly income in her family because her husband ran a shop. For both individual and co-operative members, the income mode was R501-R1000 per month (which was around the pension level of R780 monthly). Similar patterns were seen with co-operative members (see table 4.4).

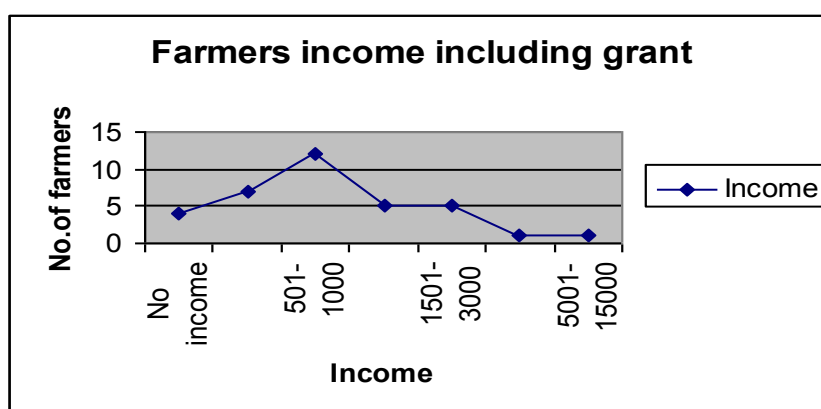


Figure 4.1: All peanut producing farmers' incomes including grants (n=42)

Grant income received: The grants received varied from one to six grants. One farmer received six grants (two were pension including of her husband and four child grants for her grandchildren). About a third (30.6%) of farmers did not receive any grants. One third (33.3 percent) of the farmers received one grant (See Figure 4.1). Four individual farmers received two grants. A third of the farmers were receiving multiple grants; some were receiving both the pension and child support grants, while others were only receiving pensions. For the co-operative members, all the respondents received grants, with most receiving two grants (see Table 4.5). As the majority of farmers received grants, they were able to purchase inputs for agricultural production to support their families and to sell the excess to generate an income.

Table 4.5: Number of grants of peanut producing farmers (n=42)

Number of grants	Frequency	Percentage
Individual farmers		
No grants	11	30.6
One grant	12	33.3
Two grants	4	11.1
Three grants	6	16.7
Four grants	2	5.6
More than four grants	1	2.8
Total	36	100.0
Co-operative Members		
One grant	1	16.7
Two grants	4	66.7
Three grants	1	16.7
Total	6	100.0

4.2 Description of farmers' associations.

In order for farmers to succeed in their agricultural development, they need to form farmers' associations (Agricultural Policy in South Africa 1998). The main function of a farmers' association is to represent farmers, to make sure that farmers participate in the formulation of policies and agricultural development action. They have to communicate farmers' views of their situation, together with that of other agricultural sectors. Farmers are assisted by the farmers' associations to improve their managerial and organisational capacity for better production, reducing costs for the provision of information, inputs and the collection of the output, investment and marketing choices (Anon 2006).

Therefore for farmers, farmers' associations are considered as an institutional model, a mouthpiece and an important tool for participating in the new policies of agriculture. There were six farmers' associations sampled in this study (from a population of ten farmers' association), in addition to the co-operative that produced peanut butter. The population of individual peanut producing farmers was difficult to ascertain but was estimated to be in the region of 400, as it was difficult to reach other farmers as they were not members of the farmers' associations and were scattered throughout Vulamehlo.

Each farmers' association had seven committee members, including the co-operative members (also seven). Of 42 peanut producing farmers, 18 farmers in the sample were members of the farmers' association executive committees and 24 were not committee members. There were more non-executive members than executive members, as expected, because peanut producing farmers were randomly selected from each farmers' association.

For the six co-operative members, three of the farmers were executive members and three were non-executive members (see Table 4.6). Sampled members who were randomly selected made up 25 percent of the co-operative. The population of the co-operative was 24 members. All farmers, whether they were executive committee or non-executive committee members, were represented in the sample.

Table 4.6: Positions held in the Vulamehlo peanut producing farmers' associations (n=42)

Position	Frequency	Percentage
Individual farmers		
Chairperson	5	13.9
Secretary	3	8.5
Treasurer	2	5.6
Additional member	5	33.3
Non-committee members	21	58.3
Total	36	100.0
Co-operative Members	Frequency	Percentage
Chairperson	1	16.7
Additional member	2	33.3
Non-committee members	3	50.0
Total	6	100.0

4.3 Description of peanut production

Small-scale farmers in the Vulamehlo area produce their peanuts mostly for their own consumption and to generate income. They sell raw, unshelled peanuts at the Durban market and at pension points.

4.3.1: Obtaining seed

About 50 percent of individual farmers producing peanuts did not buy peanuts seed for the next planting season; they kept some of their own peanuts for planting. Forty nine percent bought their peanut seeds for planting. About 47.2 percent bought their seeds from local small-scale farmers and 2.8 percent bought their peanut seeds from commercial traders in Durban. The reason for other farmers not buying seeds was that they did not know where peanuts for seed were sold. Those who bought peanut seeds from commercial traders did not know the cultivars they had purchased. They bought raw peanuts to use as seeds as there were no local seed companies that sold labelled peanut seeds.

Members of the co-operatives did not retain peanut seed for the next season (they used all peanuts produced for peanut butter processing) and bought seed from other local farmers (See Table 4.7). The remaining small-scale farmers in Vulamehlo replanted their own seeds.

Table 4.7 Source of seed for peanut producing farmers store or buy peanut seeds for planting (n=42)

Individual farmers	Frequency	Percentage
Kept seeds	18	50.0
Bought (farmers)	17	47.2
Bought from traders	1	2.8
Total	36	100.0
Co-operative		
Bought (farmers)	6	100.0
Total	6	100.0

Farmers indicated that their customers wanted a cultivar that produced bigger peanuts, but it was difficult to obtain. Large sized peanuts were more expensive, when available. The majority of farmers (54.8%) bought a no-name cultivar from local small-scale farmers. Only one bought seed from traders at Umzinto or in Durban.

Table 4.8: Size of land producing peanuts (n=42)

Land size (ha)	Frequency	Percentage
Individual farmer		
0.11 ha	6	16.7
0.15 ha	12	33.3
0.36 ha	6	16.7
0.70 ha	6	16.7
1.69 ha	6	16.7
Total	36	100.0
Co-operative		
0.13	6	100.0
Total	6	100.0

From personal observation and information from the extension officer for the area (Miss Nkomo, 2005), the majority of the farmers (33 %) had 0.15 ha plots in the community gardens (See Table 4.8). Members in community gardens were allocated plots of equal size. In one of the community gardens, each farmer had a bigger plot because there were only eight participants in an area of 13.4 ha, instead of the usual 12 participants. All community gardens were having pipe irrigation scheme with tapes. There was no sprinkle irrigation. No one grew peanuts near their homesteads because of lack of fencing.

4.3.2 Planting

Most peanut-producing farmers reported that they planted peanuts in September if there was no drought, while other farmers planted their peanuts in October. September/October seemed to be the season for planting peanuts. They used row planting in order to facilitate weeding with hoes, as the majority of farmers used hoes for both planting and weeding. It took four months for peanuts to be ready for harvesting in the Vulamehlo District, according to the farmers interviewed.



Figure 4.2: Planting stage of peanuts



Figure 4.3: Peanut crop at maturation stage

4.3.3 Tools used for cultivating peanuts

The majority of small-scale farmers used hoes for planting (97 percent) and only 11.1 percent used tractors for soil preparation. Although tractors were available for hire in the community, farmers could not afford to hire tractors for soil preparation. There were only a few farmers who employed animal traction (11.1 percent), using donkeys. Co-operative farmers used hoes for the whole process of cultivating peanuts, from soil preparation to harvesting. Most hoes use by farmers purchased by them (52.8%), while many (especially those of the co-operative members) were donated by the KZNDAEA.

Table 4.9: Condition of hoes of peanut producing farmers of Vulamehlo (n=42)

Condition of hoes	Frequency	Percentage
Individual farmers		
None	2	5.6
New	19	52.8
Donated	13	36.1
Old	1	2.8
Total	36	100.0
Co-operative		
New	0	0.0
Donated	1	16.7
Total	6	100.0

4.3.4 Harvesting

Those who planted their peanuts in September harvested in February and those who planted in October harvested in March. They harvested their peanuts during drier weather, when the soil was dry enough to stop soil from sticking to the stem and pods. They harvested their peanuts

manually. They removed peanut vines from the soil by hand as they did not have peanut-digging machines for harvesting peanuts.



Figure 4.4: Harvesting stage in the community garden



Figure 4.5: Weighing of peanuts after removing from vines



Figure 4.6: Packing of harvested peanuts in a crate

Seasonality: Most farmers (66 percent) had ripe peanuts in February, while 27.8 percent of farmers had peanuts available in March. Only 2.8 percent of farmers had peanuts available in January. The season for peanuts for the majority of farmers was February. The season for peanuts for co-operative members was also February, for their peanut butter project. This is a very limited season for producing peanut butter and, for efficient use of the equipment; research should be conducted into extending the season for having ripe peanuts. Farmers can extend peanut production as they have small irrigation schemes (piping system) in their community gardens. According to the NDA (2002) there are cultivars for late planting (Kwarts) and Harts cultivar is a short-growing season and therefore the peanut season can be extended.

Table 4.10: Seasonality of peanuts at Vulamehlo (n=42)

Season	Frequency	Percentage
Individual farmer		
January	1	2.8
February	24	66.7
March	10	27.8
April	1	2.8
Total	36	100.0
Co-operative		
February	6	100.0
Total	6	100.0

After harvesting, producers carried peanuts in sacks on their heads from the garden to their homesteads. They did not let their peanuts dry in the field, as their community gardens are far from their homes and security was lacking. They felt that if it rained, rain would damage their peanuts. If peanuts are rained on, the risk of mould growth increases and this may result in a complete loss of the peanuts. Farmers stated that if their peanuts showed any trace of mould, they discarded those peanuts, as mould is dangerous for their lives and for their customers.

4.3.5 Drying

After harvesting, peanut plants are laid out in the sun for a few days until the peanuts are properly dry. The farmers then strip off the pods from the plant. Individual farmers do not shell their peanuts, while co-operative members shelled their peanuts by hand. Cooperative members shelled peanuts because they make peanut butter. They stated that shelling peanuts is

time-consuming and laborious. When the peanuts were dry enough, they kept their peanuts in different storage places. Farmers that supply peanuts for the peanut butter project dry their peanuts in their homesteads.

4.3.6 Storage

Farmers stored their raw peanuts in a variety of containers. Raw peanuts are peanuts that are not subjected to any treatment or heat prior to grinding. The majority of farmers stored their peanuts unshelled in sacks (50kg) and a few farmers used drums and plastic bags. They used different types of sacks. Some used sacks made from jute, while others used sacks (50kg polyethylene) that are used to pack chicken feed (See Table 4.11). During storage all the farmers interviewed indicated that they mixed their unshelled peanuts with ash, to protect them from insect damage.

Table 4.11: Packaging used for storage (n=42)

Package for storage	Frequency	Percentage
Individual farmer		
Plastic Drums	2	5.6
Plastic container	1	2.6
Plastic bags	1	2.8
Polyethylene or jute sacks	30	83.3
Tank	2	5.6
Total	36	100.0
Co-operative		
Polyethylene or jute sacks	6	100.0
Total	6	100.0

Most individual farmers producing peanuts used polyethylene sacks for their storage of peanuts for consumption and for planting the next season. Most farmers (83. 3%) used sacks for storage and 16. 8 percent used other containers such as drums, plastic bags and tanks. Farmers stored their peanuts in containers (not the tanks) in their homes but did not have proper storage facilities. Only a few farmers (5.6%) used tanks as suitable storage. Co-operative farmers all used polyethylene or jute sacks to store the peanuts.



Figure 4.7: Peanuts packed in sacks

4.3.7 Local transportation from fields

Peanut producing farmers generally transported their peanuts from their gardens to their homesteads in sacks on their heads, a distance of one to two kilometres. Those who were far from their homesteads used rented transport or animals (donkeys). Farmers were sometimes assisted by the Vulamehlo DAEA technician of the area to transport their peanuts from the garden to their homesteads in a small truck. Co-operative members were assisted by the technician to transport their peanuts from the field to the processing plant in a small (government own) truck, because the fields were far from the peanut butter project. This was a free service.

About 88.9 percent of farmers interviewed had new hoes including donated hoes, and about 5.6 percent had old hoes. The tractors used by the farmers were old but not owned by the farmers. They hired tractors locally from a nearby Indian farmer. Most farmers (52.8%) had bought new hoes in 2005. About 36.1 percent of farmers had hoes which were donated to them by the DAEA. Few farmers (5.6%) had old hoes and even fewer (2.8%) farmers were without hoes. All the farmers who were members of the co-operative had hoes which were donated by the DAEA. They were therefore able to continue with peanut production as they had equipment and they had some money to purchase other inputs needed for agricultural production.

4.4 Packaging for sale

Only 16.7 percent of the individual farmers did not use any packaging, as they did not sell their peanuts (See Table 4.12). They produced peanuts for their own consumption only. Twenty percent of farmers used plastic bags to sell peanuts to their customers. Sixty percent were using sacks to sell peanuts to their customers, as their customers used their own containers when buying peanuts from the farmers who were selling peanuts house to house. The co-operative members did not sell their peanuts. There was thus no need for any sales packaging. They used their peanuts directly, to make peanut butter.

Table 4.12: Packaging used by peanut producing farmers of Vulamehlo (n=42)

Package for sale	Frequency	Percentage
Individual farmer		
None	6	16.7
Plastic bags	8	22.3
Sacks	22	61.2
Total	36	100.0
Co-operative		
None	6	100.0
Total	6	100.0

4.5 Transport to market

Some farmers (16.7 %) sold their peanuts directly to their customers from their fields and the customers always brought with their own packages to collect their peanuts, so transport was not needed. More (35.67 %) farmers used rented transport to distribute their product (peanuts) to the markets. A few (11 %) of the farmers used donkeys for transport (See Table 4.13). The remainder used public transport (27.8%). None of the farmers had their own transport. Farmers relied on public transport, which is unreliable, expensive and scarce; farmers who could not afford to pay the fare will sell their product in their village, only.

Table 4.13: Type of transport used to transport peanut product to markets (N=42)

Individual farmer	Frequency	Percentage
No transport	6	16.7
Bus	1	2.8
Taxies	9	25.0
Rented	11	30.6
Donkeys	4	11.1
LDVs	2	5.6
Total	36	100.0
Co-operative		
Rented	6	100.0
Total	6	100.0

Farmers were selling their peanuts from the community gardens direct to their customers during harvesting, or directly to the processing plant, or otherwise travelled to Umzinto and Durban (See Table 4.14). The co-operative members do not have a sufficient supply of peanuts to meet their processing demand. To satisfy their customers, they need sufficient land to produce enough peanuts. As a struggle to meet the demand, they bought additional expensive supplies of peanuts from traders and commercial processors. This lowered their profits.

Table 4.14: Markets used by peanut producing farmers (n=42)

Individual farmer	Frequency	Percentage
Direct from garden	6	16.7
Processing plant	9	26.0
Umzinto	8	22.2
Durban	13	36.1
Total	36	100.0
Co-operative members		
Processing plant	6	100.0
Total	6	100.0

The average number of trips to the market ranged from one to four trips a month (See Table 4.15). The majority of farmers interviewed took two trips a month to the market (36.1 percent) and 27.8 percent had four trips a month to the market to sell their raw peanuts (See Table 4.15). Individual farmers (86.6 percent) undertook trips to market to sell their raw peanuts at Umzinto, house to house, and 36.1 percent sold their peanuts in Durban to traders. A few

farmers (16.7 percent) did not make any trips to the market, as they did not sell their raw peanuts.

Table 4.15: Number of trips per month to the market for peanut producing farmers (n=42)

Individual farmer	Frequency	Percentage
No trips	6	19.4
1 trip	4	11.1
2 trips	13	36.1
3 trips	2	5.6
4 trips	10	27.8
Total	36	100.0
Co-operative		
No trips	6	100.0
Total	6	100.0

4.6 Sale of raw peanuts

The farmers sold their raw peanuts for R6.00 per 3kg container (unshelled) or R2.00 for 500g containers. Large 50kg sacks were sold for R35.00. They did not sell any roasted or snack peanuts. The farmers did not have adequate information on pricing strategy (Golob *et al.* 2002), and so were disadvantaged. The quantity sent to the market was 2 680kg. Farmers do not keep proper records. They only tell what quantity in sacks they have sold. For making peanut butter, co-operative members bought the bigger-sized peanuts, as these were more suitable for making peanut butter. Traders preferred to buy the larger sizes of raw peanuts, but they also bought small sizes to cater for all their customers, who would need smaller peanuts for other peanut products such as roasted peanut snacks.

4.7 Focus group discussion with co-operative members (peanut butter processors)

The focus group discussion was conducted with the co-operative members who manufacture peanut butter in the Vulamehlo District. Co-operative members are also members of a farmers' association. Co-operative members produce peanuts on a three-hectare area; they used all peanuts produced on this land to make peanut butter.

4.7.1 Peanut production needed for peanut butter processing

The co-operative members, besides producing their own peanuts for processing, obtained additional raw material (peanuts) from other local small-scale farmers, commercial traders and from the other commercial peanut butter processor near Pietermaritzburg. Unshelled peanuts from local small-scale farmers were of poor quality for the members of the co-operative. They complained that peanuts purchased from the wholesaler were infected with mould; others were bruised and contaminated with foreign material that is not recommended for consumption. They stated that removing foreign material reduced the quantity of the peanuts they had paid for. Foreign material in peanuts was reported as bruised peanuts or damaged peanuts. Soil, stones or anything which was not peanuts such as peanut shells, were contaminants.

The co-operative members produced peanuts in 2005. They produced 26×50kg sacks from 3 ha. They bought 22 sacks from small-scale farmers at R120 per 50kg of unshelled peanuts. From a wholesaler in Durban they bought 1×50kg peanuts at R200, with the skin on the peanuts. From the commercial peanut butter processors they purchased 8×50kg peanuts, at R352 per 50kg. They purchased raw material for planting and for processing. They were not using fertilizer or pesticides but only kraal manure when planting their peanuts. The total amount spent on peanuts for processing to peanut butter in 2005 was therefore R5656, over about three months. This is the total amount they have spent to purchase raw peanuts



Figure 4.8: Members of the Sinolwazi Co-operative

In order to continue with their peanut butter project (which did not yet bring in sufficient profit) they were also involved in the following projects with the DAEA: vegetable production, poultry production, mushroom production and crop production (potatoes, sweet potatoes and madumbes). Some members of the co-operative were involved in the activities mentioned above, while other members were exclusively manufacturing peanut butter.



Figure 4:9: Temporary structure used by co-operative members

Members of the co-operative used a temporary structure made of planks to house the machinery which made peanut butter. This is situated next to a poultry house, 200m from the main gravel road. There is no electricity in the area and they reported that they used a generator power for grinding and gas power for roasting machine while they were waiting for installation of the electricity. They have the site where they will have a permanent structure, situated five kilometres from their temporary structure and closer to their homesteads. While they are waiting for the building of this structure, one of their donors has promised to donate a container so that they would process their peanut butter in more hygienic, suitable and acceptable conditions.

During the discussion, co-operative members were concerned that their temporary structure gave them many problems, as their structure leaked when raining and the roof of their structure is often blown off by the wind. This affected their progress, as they could not make peanut butter during bad weather conditions. They worked twice a week (Tuesdays and Fridays) to make peanut butter but if there was a big order they worked every day.



Figure 4.10: Gas power roasting machine



Figure 4.11: Electric grinding machine

The co-operative members have two roasting machines and two grinding machines, but at the moment they are using one roasting machine and one grinding machine because the capacity of their structure is too small to accommodate all four machines in one structure. Roasting and grinding machines are kept in separate rooms. Because of the limited space in the processing plant, they keep the machines in these separate rooms, as they do not have spare space. The capacity of the machine for making peanut butter is 11 kg. They are filling 80 (410g) bottles with 50 kg of peanuts, according to the orders received. They made eleven bottles per batch and took 30 minutes per batch, which means that the machine is using half capacity. There were five members needed to do the processing, while the other members were involved in packaging and cleaning of the equipment used for making peanut butter. The reason for only five people needed to process peanut butter was that they used one roasting machine and one grinding machine only. They received few orders. They said: "as soon as we have a proper physical structure, we will manufacture peanut snacks such as roasted peanuts and sweets", to diversify their products.

4.7.2 Peanut processing

The cooperative members started to process peanut butter in November 2004. The Agricultural Research Council (ARC) donated one roasting machine and one grinding machine to co-operative members, to use for processing peanut butter. Co-operative members were new to the processing of peanuts into peanut butter and had to learn how to do things. Co-operative members used the roasting machine and then the grinding machine to make peanut butter. They first roasted peanuts in the roasting machine. After being roasted, peanuts were moved to the grinding machine to be ground into peanut butter. Peanut butter is packed in 410g plastic bottles.

During discussion, co-operative members revealed that they did not add anything to peanut butter; they only used peanuts. According to Smartt (1994:210), peanut butter should have 90 percent peanuts and a maximum/minimum of 10 percent solid or other ingredients. The co-operative members do not add salt and vegetable oil. They were supplying peanut butter to Rastafarians who do not eat vegetable oil but do eat natural peanut butter with no added oil. The hospital also wanted peanuts without salt and oil for the sake of their patients' health but because of aflatoxin problem they did not have sufficient peanuts to make peanut butter.



Figure 4.12: Stages of peanut processing



Figure 4.13: Packaging of peanut butter in bottle

Equipments used by co-operative members to make peanut butter:

- Petrol for an engine used for two grinding machines and gas for two roasting machines.
- Basins for washing utensils, collecting and putting peanuts in the roasting machine and for pouring and collecting peanut butter from the grinding machine (See Table 4.16).
- Detergents to wash the equipment used for making peanut butter and also for cleaning the processing and storage rooms.

Table 4.16: Available and required equipment

Available equipment	Additional required equipment
2 gas roasting machines	Peanut shelling machine
2 motorised grinding machines	Measuring scale
3 basins	Buckets
2 serving spoons	Electric or gas stove
	Labels

4.7.3 Informal peanut butter marketing

Marketing includes developing and producing products in packaging, setting the price, promoting and distributing the products to the consumers (Perreault & McCarthy 2002). The co-operative members used 500g plastic bottles for packaging when they started their business. The reason for using only one sized bottle was because it was the only size available locally. They charged R7.00 per 500g bottle of peanut butter to attract the customers and gradually increased the price to R9.00. Their customers complained that the price was too high and they reduced the price to R8.00, which is the price that they are charging to date. All of these prices, including the highest price, were less than that charged by the formal supermarkets. The price that competitors charge is usually a determining factor in setting a price (Edward, Economy 2000). The co-operative is not making any profit at the moment. They work without earning any income, as their peanut butter project is still new.

Pricing

The pricing and marketing policies of a peanut selling system not only affect the operation of the market but also the profit of the processing activities (Mhazo *et al.* 2003). Prices should be set according to individual products on the basis of their production costs, what the competitors are charging and what the customers are prepared to pay (Palmer 2000). The farmers in the Vulamehlo did not understand that they should checking shop pricing and set their prices appropriately. The price should be in line with those of the competitors (Edward 2000). Farmers limited access to and inability to use, market information is due to an underdeveloped telecommunication infrastructure (telephones and the internet) in rural areas (AOFF 2003).

Promotion: During the discussion co-operative members reported that they were using two promotions to make their customers aware of their product: word of mouth (direct selling or personal selling) and displays during agricultural Ward and District shows. At the moment their peanut butter is not labelled, as they are waiting for the Agricultural Research Council (ARC) to supply them with labels. The labels that they were funded by SEDA (Small Enterprise Development Agency) Small-scale farmers are unlikely to have access to television but may have access to local radio and newspapers. Posters and signboards in rural areas and special promotions at retailers are likely to reach more consumers (Fellows 1997). Personal contact with customers may be more effective.

Co-operative members also mentioned that they have negotiated with a supermarket at Umzinto, local trading stores, crèches and tuck shops, the Scottburgh hospital and the Umzinto prison, to supply them with peanut butter. The Scottburgh hospital and Umzinto prison have indicated that they would need the co-operative to supply them with 50 litres of peanut butter per month. They also indicated that they would negotiate with other local retailers to supply them with their peanut butter.

Distribution: Co-operative members sell peanut butter locally, door to door and at pension points. They also sold peanut butter to stokvel members during December, as stokvel members had distributed their money to buy groceries. The members of stokvels purchased peanut butter from the peanut butter co-operative, because their peanut butter was cheaper than that of the retailers. Tuck-shop owners purchased peanut butter from the co-operative processing plant. They revealed that they were intending to supply HIV/AIDS Pop-in Centres, crèches, trading shops near the project and tuck shops. As soon as the proper, processing has been built they hope to supply Scottburgh hospital and Umzinto prison. They used public transport to distribute their products.

Access to customers: They reported that their processing plant is 200m from the main road. Therefore customers on foot or with transport have easy access to the plant. Other customers came to the processing plant to purchase peanut butter with public transport or with their own transport. They mentioned that the community around the project also came to purchase peanut butter directly from the processing plant.

Transport: Transport used by small-scale farmers from the field to their homestead or to the market is one of the major problems (Breth 1998). The co-operative members used public transport (taxis and rented transport) to sell their peanut butter, especially to pension points, as some of the pension points are far from their processing plant. One of the co-operative members said "we walked two kilometres to the processing plant because the transport is scarce and expensive".

The informal traders at Umzinto and Scottburgh buy raw peanuts in Durban from Indian traders and pay R450 for 50kg. The informal traders sell both unshelled peanuts and roasted peanuts but mentioned that marketing of these products was very slow. They said "We only sell 30 packets of roasted peanuts per day at R0.50 per 30g". The informal traders do not purchase their stocks from the farmers in Vulamehlo because they lacked knowledge about them.

4.8 Formal traders survey results

A survey among formal traders was conducted at Umzinto and Scottburgh, in the Vulamehlo District, concerning the marketing of peanut butter. Interviews with owners of selected stores were conducted. The Cash 'n Carry owner indicated that they only supplied the Black Cat peanut butter brand, which is sold out regularly. They usually sell six cases (that is 6x24 bottles) a month (quantity has been checked it is correct). For more information on the size range that was available in Cash 'n Carry (see Table 4.17). The owner of Cash 'n Carry said that the most popular size of peanut butter bottle, that customers purchased most frequently, was 410g. Umzinto Supermarket sold 60 percent of the peanut butter ordered during the month. They supplied both smooth and crunchy peanut butter. The sizes of bottles that were available on shelves ranged from 270g to 410g and the price ranged from R 8.50- R11.55 (see Table 4.17). Common packaging for peanut butter was plastic bottles; peanut snacks were sold in plastic bags. The cheapest snack brand was No Name and the most expensive one was Tom Sawyer.

Formal peanut-selling outlets and supermarkets chains were visited in order to determine prices, quantities and packaging (see Table 4.17). Checkout and OK foods at Umzinto sold only 30g roasted peanuts, at R1.00, and 150g Simba brand roasted peanuts at R5.99. Peanut butter brands available were Black Cat and Yum Yum. Containers of Yum Yum weighed 400g; Black Cat was available as 410g and 800g bottles and prices ranged at R 7.99 and R17.95 (see Table 4.17). These are all more expensive than the small-scale farmer's price.

Table 4.17: Peanut butter and roasted peanuts available in supermarket chains (n=4)

Shop name	Brand and type	Size	Price	Comment
	Peanut Butter			
Checkout OK Foods Allyson Cash 'n Carry	Black Cat	410g	R7.99	Peanut butter
		800g	R17.95	Packaging
		810	R20. 99	Glass bottle
Paramount Shoprite	Yum Yum	400g	R7.99	Plastic bottle
	Black Cat	800g	R15.99	Glass bottles
		270g	R8, 99	
		410g	R9. 99	
		810g	R17. 95	
	Nola	410g	R7. 99	Plastic bottles
		800g	R15. 99	
	No Name	400g	R7. 99	Plastic bottles
		800g	R15. 99	
Roasted peanuts	Brand and type	Size	Price	Comment
OK	House brand	30g	R0.50	Paper packet
	Simba	30g	R1.00	Sealed plastic bags with label
Checkout Shoprite	Simba	150g	R5.99	Sealed plastic bags with printing
	No Name	50g	R3. 99	
		500g	R10. 79	
	Tom Sawyer	100g	R3. 99	
		200g	R6. 99	
		500g	R14. 99	

4.9 Formal peanut processing plant results (Pietermaritzburg)

An interview regarding peanut processing was conducted at a peanut butter processing plant at Mkhondeni in Pietermaritzburg. They make both smooth and crunchy peanut butter types with no brand name. They buy raw peanuts from agents, who buy raw peanuts from commercial farmers (but not from KZN). They manufacture other peanut products such as roasted peanut snacks, flake peanuts, sprinkle peanuts for decoration purposes and sugar-coated peanuts.

The peanut processing plant uses an emulsifier when making peanut butter, to prevent the separation of oil in peanuts from the peanut solids. According to the peanut processing manager " emulsifier is not suitable for babies and diabetic patients." To reduce aflatoxin in their product (peanut butter) they add soya blends. They supply Cash 'n Carry, hospitals, prisons, hotels, institutions of education, schools with feeding schemes, wholesales and retailers such as Pick n' Pay and Checkers.

For packaging they use plastic bottles with anti-tamper lids. They also use buckets. The size of plastic bottle is 400g and the sizes of buckets are: 1 kg, 2 kg and 20 kg. They were not prepared to divulge their pricing structures. They do not use their brand name, as they sell their products to other businesses, who will add their own brand names when selling these products to their customers. The processing plant included the date of manufacture and expiry date of the product and batch code of the product on the label, which is the information needed by the consumer. The batch code is important, especially if the consumers experience a problem with the product. Only those products with that batch code will be collected from the shelves for inspection in the laboratory, if necessary.

To be successful, small-scale farmers and organisations need to identify potential markets before they produce any product. They need to identify supply agents and market requirements. Small-scale producers do not conduct market research to find out what the market needs and where they will sell their produce or products. Small-scale processors should have a reliable and efficient delivery of high-quality produce all year round, to satisfy the customers and their suppliers. Small-scale farmers should link with large-scale (commercial) farmers, processors, agents, as well as with well-organized small holders' associations with proven reliable track records and with product experience (RIMFI 2005). Linking with agents or such organizations will help farmers learn new technology and marketing information.

4.10 Discussion

This section will link the results of the study with what was presented in the literature. It will start with the requirements that the market demands of good products, from the stages of production, harvesting, transport and sales, marketing outlets and investigation of current linkages.

4.10.1 Marketing requirements for peanuts from Vulamehlo peanut producing farmers

This section will give a brief discussion of the market requirements and market outlets in KZN and how to improve of peanut processing through investigating the current supply chain of peanuts produced by the small-scale farmers of Vulamehlo.

4.10.2 Peanut Production

- **Seeds**

Vulamehlo farmers used raw peanuts produced for consumption as seeds, as the local seed companies did not sell peanut seeds. The majority of small-scale farmers used the seeds that they kept, after harvesting, for the next planting season. According to literature, more than 80 percent of the crops in developing countries are sown from seed stocks selected and saved by farmers (Bishaw & Turner 1998). Peanuts sold by traders are not meant for seed but for consumption. According to Bishaw and Turner (1998) farmers in rural areas are not supplied with appropriate varieties or quantity of seed by the seed supplier.

According to the NDA (2002) there are cultivars for late planting such as Kwarts, and the cultivar Harts for a short growing season, so that farmers could in theory produce peanuts all the year round. The KaNgwane Red cultivar is suitable for developing farmers or small-scale. Peanut seeds used by farmers were for a short season of four months and are low-input cultivars grown within the rainy season without irrigation. In the study done in Senegal, access to peanut seeds was limited to farmers who sold peanuts through official channels. As a result, 36 percent of producers from the Groundnut Basin lacked seeds (Badiane 2001). According to FAO (2003), short season cultivars are more resistant to aflatoxin than long-season cultivars. Farmers should be assisted by extension officers to get short season cultivars such as Harts, which is available in South Africa NDA 2002).

- **Implements for planting**

The participants stated that hand tools (hand hoes) were tiring, slow and time-consuming, when compared with other tools. In Senegal, the introduction of hand operated implements such as planters and wheeled hoes assisted small-scale farmers to expand the area to be cultivated. Tools such as plungers or jab-type hand planters, manually drawn seeders and wheeled hoes are used in production in other countries such as Thailand, Zimbabwe, India and Brazil (FAO 2003). In Burkina Faso, farmers who used animal traction cultivated four times more land than farmers who used hand hoes (FAO 1998). The study that was conducted in Senegal indicated that peanut farmers saw animal traction as a solution to production problems. According to Hart (2003), farmers use mechanized implements only when really necessary; they are still making use of animal traction, which is more affordable. For higher output production, upgraded implements such as planters and wheeled hoes should be used.

- **Land**

Peanut producing farmers used communal land to produce their peanuts. Farmers produced peanuts in community gardens. Farmers used community gardens because they were fenced to prevent livestock from destroying their crops. Co-operative members were sharing a three ha area, with a membership of twenty-four. Their fields were not divided into plots; they worked together as a group and used all their peanuts to process into peanut butter. Due to the small size of the community gardens (plots), it was difficult for peanut producing farmers to raise sufficient capital to improve standards of living and to purchase inputs required for production. This was shown by research done by Grigg (1995) and Breth (1998).

- **Planting season**

Vulamehlo peanut producing farmers plant their peanuts in September and October, during hot and sunny conditions. The normal planting time for peanuts in South Africa is mid-October to mid-November (NDA 2002). According Burgees et al. (2000:136), peanuts grow well in hot, sunny conditions, with daytime temperature of between 25° C and 34°C. Peanuts require sunshine and a warm growing season of between 120 and 140 days, with moderate rainfall (Anon 2001). Farmers revealed that they only produce peanuts once a year, as they were not aware that there are cultivars that can be planted all the year round. Small-scale farmers usually cultivate short-season, low-input cultivars, which are suitable to be grown within the rainy season (FAO 2007). Farmers stated that they planted in November due to drought and felt that they were not going to get good yields due to late planting. Drought is a major cause of poor crop performance and yield (African Organic Farming Foundation (AOFF) 2003).

- **Harvesting**

Peanut harvesting is labour intensive and tiring, as small-scale farmers harvest manually. All farmers interviewed used hand labour to harvest peanuts. Peanuts can be harvested either by means of the stacking method (hand harvesting) or mechanically (DA 2002, Peanut Company of Australia (PCA) 2007). After harvesting, they took the peanuts to their homesteads to protect their produce from rain and theft. They mentioned that rain damaged peanuts, resulting in aflatoxin contamination. Therefore farmers should not leave peanuts in the field to dry.

According to PCA (2007), leaving peanuts in the field is risky, as peanuts will be damaged by rain, eaten by birds or over-dried. In Senegal, farmers used a stationary thresher to harvest peanuts (FAO 1998). Immediately after harvesting it is important that peanuts are dried to a safe moisture level as rapidly as possible. In Africa, small-scale farmers use the sun-drying method to dry their peanuts, due to the unavailability of artificial drying tools (FAO 2007). If harvesting machines were accessible to small-scale farmers, there would be less drying time needed and less decay and mould contamination in peanuts (FAO 2007).

Within four months some Vulamehlo farmers sell their peanuts (unshelled) to the co-operative processing plant. Members of co-operatives should buy more peanuts from local farmers. Shah (1998) stated that unshelled peanuts at 21° C could be stored for only four months, so peanuts need to be sold quickly, to avoid spoilage. This is why farmers sold their peanuts immediately after harvesting.

- **Transport and market**

Transport in many developing countries is the major constraint faced by all communities in rural areas. Rural transport is inadequate and the existing road network is in a poor state, needing substantial rehabilitation. Farmers have reported that they travelled between one and two kilometres from their homesteads to the community gardens, resulting in more time being spent in travelling to the garden. Some farmers used donkeys and rented transport to move harvested peanuts from the garden to their homes. According to a study in the Congo, 70 percent of farmers carried their produce to the market over a distance of more than 10 km (Eastern Africa Crops Research Network 2002). Vulamehlo small-scale farmers lived far from any roads on which crops could be transported to places of collection, storage or marketing. As is reported in the literature, farmers often carry their products on their heads, in small quantities, over very bad roads or footpaths (FAO 2006).

Researchers have indicated that where a distance is over two km and where there is no cheap transport, it is likely that less time will be spent in the garden (Grigg 1995, Golob2001). In most areas, where goods or crops are transported by farmers, or by animals, farmers travel long distances to move harvested crops to their storage or marketing place (FAO 2006). Peanut producing farmers generally rely on public transport to distribute their peanuts and peanut products. This is expensive and unreliable. In Nigeria, farmers used ox carts to

transport agricultural products. Ox carts are a simple and cheap mode of transport (FAO 2006).

4.11 Market outlets for peanut products available in KZN

The present study revealed that in KZN there is only one commercial peanut processing plant, situated in Pietermaritzburg. This plant processes different kinds of peanut products, such as roasted peanuts (snacks), peanut butter and other peanut products. According to the research interviews, the processor supplies wholesalers, hospitals, schools and retailers (Guthrie 2005, personal communication). The manager of the processing plant revealed that they purchased raw peanuts from large-scale commercial farmers and agents.

The co-operative members process peanuts to make peanut butter, only. They use plastic bottles for packaging, as they are cheaper than glass bottles and the only bottles locally available. Plastic bottles are more durable, and safer to use, because if the bottle falls it will not break like glass bottles and they are cheaper than glass bottles (Axtell 2002:20). Co-operative members hoped that they would have more outlets as soon as they are well established and have a proper housing structure and efficient equipment to process their peanut products. They have investigated numerous potential outlets and will benefit because on the south coast, it is only the co-operative members that sell peanut butter locally; some of their customers came to the processing plant to purchase peanut butter. This is direct, informal marketing. Marketing of small-scale products, in a study done in Zimbabwe, was found to be informal. Agribusinesses located in rural areas relied on demand from local informal markets, which are small and unreliable (Mhazo *et al.* 2003). In KZN there is only one commercial peanut processor, which indicates that co-operative members have few competitors.

Peanut farmers from Vulamehlo do not supply any formal outlets with their products, so there is no existing distribution network for sales of products because buyers and sellers are not aware of each other's existence (FAO 2007). It is important that negotiations are carried on directly between farmers and buyers.

4.11.1 Link with suppliers of inputs

The Vulamehlo small-scale farmers are situated far from seed companies. Towns around Vulamehlo do not sell peanut seeds. An agricultural co-operative selling inputs is not available

in the Vulamehlo district, as it is in other countries (National Agricultural Directory 2007: 418). The other suppliers that are situated far away from the direct control of the farmers are those that sell other requirements for processing, such as soya blends, to reduce the level of aflatoxin and number of bottles and plastic bags.

During discussion, co-operative members reported that they wanted to link with manufacturers and wholesalers of plastic bottles for peanut butter, as they were using one size (500g) of bottle for the packaging of peanut butter. They buy their plastic bottles from a local a retailer called Adams, at Umzinto, rather than a wholesaler whose price would be lower. They also needed plastic bags for the packaging of peanut snacks (roasted peanuts), which they were intending to manufacture. To make a peanut butter, an emulsifier is needed to prevent separation of oil from the peanuts (FAO 2007). Co-operative members reported that they needed to form links with the agent who could assist them in acquiring emulsifier and also soya blend. The latter is used in peanut butter to reduce the amount of aflatoxin (FAO 2007; Guthrie 2005). Co-operative members had formed links with local, small-scale farmers, wholesalers and commercial processors only for purchasing raw peanuts. Linkages and relationships among farmers, processors, retailers, traders and agents should be established by the extension officers to assist farmer to purchase correct inputs so to increase their yields.

4.11.2 Links with informal and formal markets

Small-scale farmers need links with informal and formal markets, to improve their understanding about marketing and about how they could become more commercial and profitable, by producing crops that are demanded by the market. Farmers should plant early and late peanut varieties so that they will have peanuts when the price is high. Farmers should grade and sort the products to improve the quality of their product when they are going to supply formal chains such as supermarkets. Extension staff should assist farmers by advising them to grow crops that are needed by the market. Farmers could then improve efficiency in transport by carrying larger loads (FAO 2007). Small-scale farmers have little business experience; they lack information on technology and marketing, are not well organised and they lack knowledge of pricing strategies upon which to plan market-oriented production systems. They need technical advice (AOFF 2003). This description applies to the farmers of Vulamehlo as well. The next chapter will present the conclusion and the recommendation of the research.

CHAPTER 5: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of the study

The aim of the study was to investigate the market requirements for peanuts purchased from Vulamehlo farmers in relation to the sale of raw peanuts and further processing. Another purpose was to discover whether or not market outlets for peanut products in KZN were available and whether or not current links between farmers, agents, peanut processors and formal retailers could be used to improve the marketing of peanut butter produced by Vulamehlo small-scale farmers. Questionnaires, focus group discussions and observation were used to collect data from farmers and informal processors of peanut butter. Interviews were conducted with informal traders, formal traders and a commercial peanut butter processor, to collect information about their marketing of peanut products. All information was coded and entered into tables and descriptively represented as frequencies and percentages. As some of the data was qualitative, the information provided was inspected manually for themes and commonalities.

This study found that the market requirements needing to be met by small-scale farmers include:

- availability of adaptable certified seed,
- appropriate tools and equipment for cultivation,
- sufficient land to produce the required quantity,
- a consistent supply of a large quantity of a high-quality produce required by the market,
- satisfactory storage facilities,
- a reliable supply of raw material,
- access to credit and processing equipment,
- grading and testing for aflatoxin ,
- knowledge of processing regulations pertaining to food safety and hygiene practices,
- appropriate packaging material,
- reliable transport ,
- good business and management skills,
- relevant technology and marketing information.

Vulamehlo small-scale farmers do not meet all the market requirements due to the following constraints:

- Certified peanut seeds are not available to the local seed companies; the reason might be the absence of commercial farmers producing peanuts in KZN, to increase the demand.
- Farmers use community gardens divided into individual plots to produce peanuts, as they do not have sufficient land, resulting in low output.
- Harvesting is manual, which is labour intensive and tiring. If a harvesting machine could be obtained harvesting would speed up.
- Farmers do not have resources to invest in machinery that can facilitate farming and increase output. There is also a lack of maintenance facilities for these machines.
- Farmers use their homesteads to store their peanuts. The provision of adequate storage facilities should be given attention.
- Farmers used head load and animal traction to transport harvested peanuts from community gardens. To transport their products to the market, farmers also used public transport that is unreliable, scarce and expensive.
- Co-operative members use manually operated equipment to produce peanut butter. This limits the output.

Planting

Vulamehlo farmers identified their priority need as quality peanut seeds. There were no local seed companies that sold peanut seeds in Vulamehlo or around cities such as Durban and Pietermaritzburg. During the planting season, farmers purchased raw peanuts from other local small-scale farmers, local traders and a wholesaler, to use as seed (not certified). The study revealed that some farmers kept peanut seeds after harvesting for the next planting season, a practice which they said resulted in low yields.

The study revealed that the majority of small-scale farmers used hand hoes for the whole peanut production process, as they could not afford to hire tractors or draught animals. The KZNDAE donated hand hoes only to farmers involved in community gardens. Farmers should use hand operated implements, such as planters, and wheeled hoes, to expand the areas to be cultivated. Productivity and sustainability of small-scale farmers have declined due to lack of

access to land. Machinery would permit the expansion of the land area to be cultivated with the current labour available.

Harvesting

Peanut harvesting is labour intensive and tiring, as small-scale farmers harvest manually. All farmers interviewed used manual labour to harvest peanuts. Peanuts can be harvested by means of the stacking method (hand harvesting) or mechanically, using a combine, which is tractor-drawn.

Storage

The study revealed that farmers used their homesteads as storage facilities and other farmers used drums in which to keep their harvested peanuts. Peanuts should be stored in appropriate premises, so that peanuts can be kept past the season when they are abundant. This means that farmers would be able to sell peanuts off-season, when the market price is good. Emphasis has been placed on increasing the production of peanuts rather than improving storage. The provision of adequate storage facilities should be given attention.

Transport

Lack of rural infrastructure such as transport and telecommunications reduces the access of small-scale farmers to markets and knowledge. Farmers mentioned transport as a major problem, as some farmers carry their harvested peanuts on their heads from the fields to their homesteads. Individual farmers sold raw peanuts independently, using public transport (taxis and rented transport), which was scarce, unreliable and expensive. Other small-scale farmers sold their peanuts to the co-operative (unshelled). This resulted in co-operative members having to shell the peanuts themselves. Farmers need to organise transport by selling as a group, rather than individually. Bulk products will reduce the unit transport cost and should link with transport companies in order to hire the transport.

Telecommunications

A limiting factor to access to, and ability to use, marketing information is underdeveloped telecommunication infrastructure in rural areas. Small-scale farmers are unlikely to have access to television, but may have access to local radio and newspapers. Posters and signboards in rural areas and special promotions by retailers are likely to reach more consumers. Personal contact with customers may be even more effective.

Processing locally

The co-operative members did not have proper structures or equipment to process their peanuts into peanut butter. Their structure was constructed with open rafters or roof beams. This is unacceptable, as it allows dust to accumulate, causing contamination. The floor was made of very rough cement.

The processing plant should have sufficient space for all production processes, to provide space for the storage of raw material, packaging material and finished products. The floor should slope slightly, to prevent stagnant water remaining during cleaning or washing of equipment (but it does not).

The co-operative members indicated that manual shelling of peanuts that were purchased from small-scale farmers was time-consuming and laborious. Peanuts that were supplied by small-scale farmers were unshelled, while commercial processing plants supplied them with shelled peanuts. Using a peanut sheller, farmers could shell more peanuts per hour than when shelling by hand.

The researcher found that there were no commercial farmers producing peanuts in KZN, who could assist small-scale farmers with suitable peanut varieties for peanut butter production and where they could obtain certified peanut seed at a reasonable price. It was not known because their no interaction between small-scale farmers and commercial farmers.

To glean more information on where suitable peanut seed can be purchased, it is recommended that the district should contact other districts such as Ngwavuma in North Region, KZNDAEA, as small-scale farmers in that area produce large quantities of peanuts. This will assist farmers

to network with other small-scale farmers in other regions and derive a better marketing plan. This may lead to a greater impact on the input and output markets.

The co-operative members processing peanuts to peanut butter were not aware of the general food safety requirements or the hygiene practices to be followed when involved in agribusiness. The present research has shown that the commercial processor in Pietermaritzburg was aware of the regulations and legislations of food safety and hygiene, as they sold their products through formal outlets. Small-scale processors could not sell their products through formal outlets because of the quality of their peanut butter (no testing for aflatoxin and no use of emulsifier).

The small-scale farmers who manufacture peanut butter needed appropriate processing equipment to meet food safety and hygiene requirements. They also needed the acquisition of processing skills through formal training in order to make good quality products that would enable them to compete with commercial processors and to sell their products to retailers. Lack of formal training acted as a barrier to the production and marketing of peanut products.

Small-scale farmers revealed that they sell their peanuts locally, in their community gardens immediately after harvesting, house to house, or at pension points. Outlets for selling their peanuts and peanut products in KZN are available, but the quality that they produce restricts them from selling to formal outlets such as wholesalers and retailers.

5.2 Conclusions

The market requirements will be discussed in terms of the quality and quantity required. Peanuts should be tested for aflatoxin and graded according to type and size. Purchasers prefer shelled peanuts for immediate consumption or processing; however, unshelled peanuts keep for longer. To retain the quality of peanuts, peanuts should be stored in appropriate premises, where there is no moisture, as the quality of peanuts cannot be improved by storage.

The study revealed that peanuts produced by small-scale farmers in Vulamehlo were from seeds that were kept after harvesting for the next planting season. According to the literature, there are cultivars that can be planted to produce peanuts all year round. Such small farmers

could have sufficient peanut seed if there is collaboration, co-ordination and information networking among the various partners concerning the supply of quality seed. Linkages with private sectors, NGOs, researchers, the extension service and donors, at regional and national level, are necessary.

Peanuts were not graded according to size, nor checked for levels of aflatoxin. Aflatoxin is dangerous for human consumption (leading to allergen development in the consumer).

Therefore the potential use of the peanuts was limited.

The research revealed that the majority of small-scale farmers used hand hoes for the whole peanut production process, as they could not afford to hire tractors or draught animals.

Cultivating tools such as plungers or jab-type hand planters, manually drawn seeders and wheeled hoes could improve the quality of production by small-scale farmers. In Burkina Faso, farmers who used animal traction cultivated four times more land than farmers who used hand hoes. Therefore if Vulamehlo peanut producing farmers could gain access to animal traction their problems would be alleviated. The limited area able to be cultivated resulted in low outputs.

Farmers harvested their peanuts manually, as they did not have harvesting machines. This limited the potential output. They did not own shelling machines for shelling their peanuts. This decreased their production capacity.

The study revealed that Vulamehlo small-scale production did not meet the market requirements for raw selling and for further processing, because the quantity produced was inadequate. The service provided by the KZNDAEA did not meet farmers' needs for training and empowerment of small-scale farmers, especially in business skills and marketing. The extension service only provided training on the production side, without paying attention to agribusiness and the marketing of agricultural crops. These topics are important for farmers, to generate income and create jobs in Vulamehlo.

In order to improve income generation opportunities for small-scale farmers, the question is which market opportunities exist for processed peanut products such as peanut butter and roasted peanut snacks for the Vulamehlo District small-scale farmers? Aspects such as market

requirements for peanuts purchased from the Vulamehlo small-scale farmers in relation to further processing and sale of raw peanuts, market outlets available in KZN and current links between farmers, agents, processors and retailers should be investigated.

Individual farmers sold their raw peanuts immediately after harvesting, in their community gardens, directly to the consumers. They also sold raw peanuts house to house at Umzinto and in Durban. Co-operative members sold their peanut butter locally (house to house and at pension points) and directly from the processing plant. The markets of small-scale farmers were largely informal and they relied on demand from the local informal market. Current supply was able to meet this demand. This was evidence of little existing spare capacity for more sales.

The outlets are available for marketing peanut butter in KZN, but as the small processors produced peanuts seasonally and there are no large-scale peanut producing farmers in KZN; they will not be able to market their peanut butter in formal outlets, as these outlets need a continuous supply of products, as per agreed contract.

Co-operative members have linked with local small-scale farmers, a wholesaler in Durban and a commercial processor (Pietermaritzburg) only for purchasing raw peanuts, not for information required for peanut processing and other inputs needed for manufacturing peanut butter. The network of co-operative members is informal and poor. The commercial processor is able to meet necessary deadlines as they have their own transport and have peanut sources available all year round (no season). This may include imported supplies.

In order to improve current links, the KZNDAEA should create a network between farmers and buyers, with the assistance of the extension officers, to expose small-scale farmers to other marketing possibilities and to start to commercialise production in rural areas.

5.3 Recommendations for improving peanut agribusinesses in Vulamehlo.

Availability of, and access to, seed of adapted varieties at planting time is a prerequisite for agricultural sustainability and continuous peanut production. Seed provision of an appropriate variety should be available for small-scale farmers at local seed suppliers. Formation or establishment of agricultural co-operatives in rural areas will solve the problem of the unavailability of peanut seeds needed by small-scale farmers, because agricultural co-operatives could purchase inputs in bulk. Small-scale farmers would then be able to acquire certified peanut seed locally.

In order to improve income generation opportunities for the Vulamehlo small-scale farmers, market outlets should be available in both informal and formal sectors in KZN and farmers should be encouraged and assisted by the KZNDAEA to link with other farmers, agents, processors and retailers.

5.3.1 Recommendation on market requirements of raw peanuts and for further processing

It is recommended that farmers source peanut cultivars that can be planted to produce peanuts all year round. They should negotiate, together with the assistance of extension officers, seed companies in other provinces to supply them with peanut cultivars that can be planted all year round.

It is recommended that the Vulamehlo district contacts other districts such as Ngwavuma in the North Region, KZNDAEA, as small-scale farmers in that area produce large volumes of peanuts. They should be asked where they purchase suitable peanut seed. This will assist Vulamehlo farmers to network with other small-scale farmers in other regions.

It is recommended that Vulamehlo small-scale farmers sort and grade their peanuts into sizes and have them tested for levels of aflatoxin. It is recommended that they should store their peanuts in appropriate storage facilities where there is no moisture, as the quality of peanuts is not improved by storage.

It is recommended that Vulamehlo extension office responsible for peanut butter project together with specialist on behalf of the small-scale farmers of Vulamehlo district to contact commercial farmers and commercial processors in other provinces such as the Free State and Limpopo, to gain more information on the production of peanuts and on the making of peanut butter and other peanut products.

Extension officers should assist Vulamehlo small-scale farmers to gain access to cultivation tools such as plungers or jab-type hand planters, manually drawn seeders and wheeled hoes, to expand the cultivated area. It is recommended that the government, KZNDAEA, private sectors and local municipalities should identify local donors, and the farmers should collaborate with these donors to increase the output of peanut producing farmers by funding their peanut projects.

5.3.2 Current links

Co-operative members have linked with local small-scale farmers, wholesalers in Durban and a commercial processor in Pietermaritzburg for purchasing raw peanuts but not for information required for peanut processing and other inputs needed for making peanut butter. The network of co-operative members is informal and poor. The commercial processor had sufficient raw peanuts, as they network with large-scale farmers and agents to acquire all the inputs (packaging, emulsifier and other ingredients) required for make peanut butter and snack peanuts. The commercial processor network is formal and perfect.

In order to improve current links, KZNDAEA should create a network between farmers and buyers, with the assistance of the extension officers, to expose small-scale farmers to other marketing possibilities and to start to commercialise their production in rural areas.

5.4. Recommendations on the role to be played by the Government

In recent years the KZNDAEA has been encouraging farmers to establish community gardens, which contributed significantly to the livelihoods and nutritional standards of communities. The government focused on the production side and neglected the agribusiness aspect. Government should promote research on the processing of peanuts for small-scale farmers. Government should also speed up the improvement of the infrastructure, especially roads, to

facilitate the transportation of products to the market. Government may reduce transaction costs through the provision of infrastructure, marketing information, capacity building and research for small-scale farmers; to empower small-scale farmers to produce what is needed by the market and where and when to sell their produce.

The government should co-ordinate the collection, analysis and dissemination of the information on new varieties of peanuts, for small-scale farmers to be on track with new technology. The Department should stimulate the growth of agricultural co-operatives that will provide effective service (input supply) to small-scale farmers. The technology generated by academics or public sector research organizations is being applied for commercial purposes without considering small-scale farmers. Very little effective research is directed at small-scale farmers. The government should ensure that research and technology development are more accessible to small-scale farmers. Government should make sure that researchers devote more time to understanding small-scale problems; work with them to find solutions; and collaborate with extension officers to determine better methods of disseminating the results of their research.

The extension services have a major role to play in promoting production and in encouraging seed suppliers to pay more attention to the needs of small-scale farmers. Extension staffs have been trained only on the production of crops, correct skills must be matched with correct projects. They lack both processing skills and marketing information. They give advice to farmers to produce what they think is suitable for the season as the technicians were only trained on production aspects. Extension officers should identify and, if possible, make contact with other possible sources of market information such as large-scale farmers, processors and local traders to find out pricing and their terms and conditions. They need to liaise with the National Department of Agriculture and marketing companies (input suppliers), consumers and other farmers, to collate and analyse market information relevant to the existing and potential value of peanuts. Extension officers should facilitate the provision of infrastructure and marketing support services such as market facilities, information, packaging, storage and transport services, to meet the needs of the small-scale farmers.

5.4.1 Recommendations for improved peanut production

Increasing sophistication in the developing world will make it possible for farmers to extend production areas if animal traction or machinery is available, although the animal traction would incur the need to invest additional funding in ploughs, carts and cultivating machines. Production could be improved by the application of fertilizer and the use of pesticides.

With modern farming techniques and new varieties and irrigation, it is possible for farmers to extend the harvesting season and to produce peanuts all year round. Small-scale farmers shell their peanuts manually, usually putting pressure on their fingers. This is an arduous, boring, labour-intensive and low output operation. Farmers should, as a group, purchase a small hand-operated shelling machine.

Farmers should be trained in management to increase their managerial skills in planning production and input supply. Farmers should form small servicing enterprises, in particular agricultural co-operatives and farmers' associations, to strengthen their performance. Farmers should use contracts with food processors or wholesalers, who, in turn, make advanced contracts with a group of farmers to supply a specific product and extension advice, and sometimes credit, and also guarantee to buy the produce at harvesting at an agreed price.

Farmers should have proper storage facilities in which to store peanuts that have been harvested, as the price of peanuts is low immediately after harvesting. They should store their peanuts and sell them peanuts at a later stage, when the price of peanuts has been increased, or when the price is high due to the shortage of peanuts on the market.

Farmers should sell directly to consumers, locally or at farm-gate, to traders, processors or companies with whom they have an agreement or contract to buy their crops.

Small-scale farmers should not sell the peanut products individually, but group together collectively to reduce transaction costs. Bulk transportation is much cheaper compared to individual loads.

Access to capital is the other major factor for improving the material condition of small-scale farmers and other rural poor. Greater access to credit by the rural poor would entail improvements in a whole range of financial services, including appropriate saving facilities,

management, the use of financial practises to reduce transaction costs risks and the support of a variety of financial structures (formal, semi-formal and formal) in the supply of credit. Farmers should establish saving clubs in order to save money for purchasing inputs and agricultural tools and equipment.

Formulation of strategies (providing training on the processing of peanut products) that are conducive to rural diversification, development of and increase in agribusiness in rural areas and, in general, any activity aimed at increasing the value adding of agricultural produce and enhancing the competitiveness of small farmers and of other rural operators, should receive attention.

5.5 Recommendations for improving this research project

The sample was small. A larger sample may have given different results. To improve the research project the survey should be conducted in the North Region, where small-scale farmers produce large quantity peanuts. The study was conducted in the South Region, only, with farmers receiving extension service from the KZNDAEA. If funds were available the study would have been included farmers who not receive service from the KZNDAEA to increase the sample size.

This research should have included more formal traders and agents, but there were no traders and agents in Vulamehlo who could assist farmers on input supplies such as raw material and packaging material, as traders provide a number of services that farmers may benefit from. Linking farmers with agents would assist small-scale farmers to acquire inputs at the right time.

In KZN there are no large-scale farmers producing peanuts. If such farmers could have been included in the research project, on a comparative basis, more information on production and processing of peanuts would have been obtained. There is a need to find out why there are no commercial farmers producing peanuts in KZN. The inclusion of large-scale farmers producing peanuts would improve the research project by allowing comparison. According to Neil van Rij a Researcher at Cedara, there are no commercial peanut farmers in KZN, especial along the south coast due, to the moist climate that would cause diseases such as leafspot and sclerotium stem rot, which are difficult to control. For future research large-scale farmers should be included in the research, for comparison.

5.6 Recommendations for further research

Agribusiness linkages with suppliers, traders, farmers and processors would improve the small-scale farmer's negotiating skills. Therefore the KZNDAEA should improve links with large-scale farmers, traders, suppliers and processors, to get more information on peanut production and on the elimination of peanut contamination, especially by aflatoxin.

Future research should include traders and agents, to improve peanut production and processing projects.

The study revealed that farmers producing peanuts farmers were experiencing drought and sometimes plant late, due to the drought, which results in low peanut yields. More research should be done on drought resistant peanut varieties, to assist farmers to grow peanuts during drought. Further research should be done on peanut varieties that can be planted all year round. This will help co-operative members to access sufficient raw peanuts throughout the year for processing into peanut products, without purchasing peanuts from other sources.

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APPENDICES

APPENDIX A

Vulamehlo small-scale farmers producing peanuts associations

Ukukhanya Kwezwe

Zimiseleni

Mzimlilo

Thuthuka

Mazabangwane

Siyanqoba

APPENDIX B

Survey questionnaire for small-scale farmers

DEPARTMENT : Agriculture & Environmental Affairs
DISTRICT : Vulamehlo
WARD :
SUB-WARD :
RESEARCHER :

Personal Details

Number : _____ (nickname)
Age : _____ (years)
Gender : _____ (M=Male; F=Female)
Highest education level : _____ (Grade number)

Peanut production

How much did you harvest during 2005 season in kg or sacks? _____

How much have you sold during 2005 season in kg or sacks? _____

How much did you consume in your household in kg or sacks? _____

What type of packaging are you using for selling? (Sacks or plastic) _____

How do you set a price? _____

Where did you sell your peanuts? _____

What marketing (promotion) of your products did you do?

Word of mouth	Personal selling	billboards	Other specify
---------------	------------------	------------	---------------

Do you know of any other markets that you are not using? Yes / No _____

APPENDIX C

Producer's Focus group discussion guide

Peanuts for making peanut butter

Where do you get the raw material (peanuts)? _____

What quantity of peanuts have your members produced in 2005 (sacks)

What quantity of peanuts have you purchased in 2005 (in kg)?

From local producers	From commercial suppliers
----------------------	---------------------------

What other inputs have you purchased for peanut butter?

Where did you obtain your inputs?

How much have you paid for the inputs? _____

What quantity of peanut butter have you produced during 2005 (in kg)? _____

Peanut butter marketing

What is your recipe for peanut butter? _____

What packaging do you use for peanut butter?

Glass bottles	Plastic bottles	Other
---------------	-----------------	-------

What size container do you use most often in grams? (270g, 410g, 500g or 800g)

What is the capacity of the machine to make peanut butter? _____

What time is taken per batch? _____

How many bottles of peanut butter the machine can make at the same time?

How many members are involved in the manufacturing of peanut butter why?

What quantity of peanuts are needed per week to keep machine running fully for enough stock? _____

What other markets could be used to expand outlets? _____

What quantities of peanuts are needed to satisfy the demand? (bottles)

Where do you sell your peanut butter? _____

What type of transport do you use to distribute your peanut butter? (Bus, taxi, Rented, other specify): _____

How do you set the price? _____

APPENDIX D

Questionnaire for informal/ formal traders: interviews

What peanut products are you selling?

Product sold	Your purchase quantity	Sizes

Are you intending to buy more peanuts products than you currently buy?

Yes	No
-----	----

Under what conditions would you? _____

Why are you selling these size ranges? _____

What type of peanut butter packaging are you using? (Glass bottles/ plastic bottles)

Which brand of peanut product do customers prefer? _____

Where do you purchase your peanut products? (Manufacturers/ wholesalers) _____

How do you set your price? _____

APPENDIX E

Questionnaire for commercial processors

What raw materials do you purchase? _____

What types of peanut products do you manufacture? _____

Are you intending to buy more peanuts products than you currently buy?

Yes	No
-----	----

What size ranges for peanut butter do you offer? (in g) _____

Why are you selling these size ranges? _____

What type of peanut butter packaging are you using? (Glass bottles/ plastic bottles)

Who are your customers? (Wholesalers, retailers, consumers)

Which brand of peanut product do customers prefer?

How do you set your price? _____

APPENDIX E

Interview schedule for formal for formal peanut butter processor

What material do you purchase? _____

What types of peanut products do you manufacture? _____

What size ranges for peanut butter do you offer? (in g) _____

Who are your customers? (Wholesalers, retailers, consumers) _____

Are you using preservatives in your peanut butter? Yes / No _____

If yes which ones? _____

How do you set the price? _____

What are your weekly production levels? (kg) _____

APPENDIX F

Result of tested peanut from small-scale farmer's community garden