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Institutional Constraints to Horticulture Production and Marketing in Lesotho

BY

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**SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS OF A MASTERS IN AGRICULTURAL
ECONOMICS**

IN THE

**DEPARTMENT OF AGRICULTURAL ECONOMICS &
EXTENSION**

Supervisor: Prof. Ajuruchukwu Obi

April 2011

Declaration

I declare that this Thesis is my own work unless anywhere stated and referenced and has not been formerly submitted to another university for a degree. All the work by other authors used in the thesis is fully acknowledged.

SIGNATURE:

DATE:

Acknowledgements

First and foremost, glory and honour be to the Lord. I would like to lift my hands up high and thank Him who is the Maker of all the possibilities in my life. This thesis being one of them, Thank you God.

This dissertation could not have been written without Prof. Ajuruchukwu Obi who not only served as my supervisor but also encouraged and challenged me throughout my academic program. He guided me through the dissertation process, never accepting less than my best efforts. I thank him for that.

The success of the thesis is also due to the different horticulture officers in Lesotho from the four districts but in particular Mr. Kaeane who went out of his way to assist me, as well as all the farmers who took part in this study. Thank you all. Muchara, Montoeli Ashby Rantlo and Lovemore Musemwa (Luve), my friends, brothers and colleagues who showed enthusiasm, dedication, and energy beyond the call of duty to be by my side and encourage me to go on even when I couldn't. I am deeply grateful to them.

I cannot end without thanking my family, (My Uncles and their lovely wives, my Cousin brothers and Sisters both from my mother and my father's side, my Aunts) on whose constant encouragement and love I have relied throughout my entire time at the Academy. I am grateful also to the examples of my late grandparents, Clairinah Selloane Mamotlatsi Mokemane Mpholo, Adelinah Malethola Mathabiso Sennane Mphahama and Hlomelang Steven Mphahama. There have also been a range of people who have contributed their time and energy to making this research a meaningful reality through their undivided support, my sister far from our homes, Keletso Mopipi. Big sis thank you ever so much for being part of my life. I love you and God bless your good heart.

I would also deeply like to thank my colleagues whom in later stages turned into my second family this far: Miss Nomzamo Patricia Mxotwa, Miss Pumla Mittah Bokwe, and my Boss Mr. Alberto Lai-Wing. These people never stopped believing in me. Thank you guys I truly appreciate you. God bless you. I cannot forget my friends who were together with me in the struggle: Malinda (Khomali) Domela, Senate (Snazo) Masopha, Sehlotso (Nentliko) Mosola, Teboho (Stobolane) Maama, Mojabeng (Mojo) Hlao, and Vuyolwethu Ngxethwane.

On a last note my two compasses, the people who showed me the way and anchored me; **Mom and Dad**, Without your love, support and endless prayers I would not have come this far. I do not know what I would have done without you in my life. Mama thank you. Ndee thank you. I love you both. May God safeguard you for me so that you may see all my successes. God bless you.

Dedication

This Thesis is dedicated to my Dear Mother (Mama Fabiah Phyllis Motshabi Malits'oanelo Mpholo Mphahama) and Dear Father (Ndee Thabiso Ntsane Maboela Isaiah Mphahama) to whom I give all credit. I love you MOM. I love you DAD. You two encourage me to go beyond myself. You are my HEROES.

Abstract

Lesotho has a land area of about 30.340 square kilometers and is completely surrounded by the Republic of South Africa. Much of the country is mountainous. Its agricultural sector is characterized by low productivity due to erratic climatic conditions, limited arable land and fragile soils with a low water holding capacity. These conditions have proved very detrimental to crop production, rendering agriculture a risky economic activity. Numerous efforts have been made over the years to address the technical constraints confronting the sector, but nothing seems to be changing. The implication is that the technical/climatic factors mentioned above may be only part of the problem. The current situation whereby Lesotho imports nearly 95% of its domestic food requirements is unsustainable, but this desperate picture looks set to worsen with the continuing threats of contracting farm sizes and further declines in farmer participation rates. But this sector has continued to be an important source of household survival and existence.

A study was designed and conducted during 2008 and 2009 to identify the institutional constraints to horticulture production in Lesotho, looking specifically at the obstacles to effective production and marketing of horticultural products. A total of 100 farming households were enumerated in four districts of the country, namely Butha Buthe, Berea, Mafeteng, and Thaba-Tseka. A range of institutional and non-price factors in the farming and marketing environment were incorporated in a binary choice model to investigate the degree of satisfaction of the farming households with their previous year's farming results. To avoid selection bias in the sample, a probit model was chosen, and the Stata-10 software was used to estimate probit coefficients.

The results provide indications that property rights, the agricultural extension service, the condition of the physical infrastructure, and distance to markets may be crucial elements threatening the existence of this sector in Lesotho. The difficulties in accessing markets and land remain important institutional constraints to horticulture production and marketing in Lesotho. Recommendations made on these issues include providing more policy support to homestead gardening and for these issues to be incorporated into the Vision 2020 process. Also to be included is the issue of addressing the growing national food insecurity and enhancing Basotho livelihoods in general.

Keywords: *Horticatures, institutional constraints, production and marketing environments, property rights, title deeds, infrastructures, probit model.*

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ACRONYMS

AIDS: Acquired Immune Deficiency Syndrome
ASAL: Arid and Semi Arid Land
ASIP: Agricultural Sector Investment Programme
CDF: Cumulative Distribution Function
DFA: District Farmer Association
EE: East East
ES: East South
FANRPAN: Food, Agriculture and Natural Resources Policy Analysis Network
FAO: Food and Agricultural Organization
GDP: Gross Domestic Product
GNP: Gross National Product
GOL: Government of Lesotho
HIV: Human Immunodeficiency Virus
IFAD: International Fund for Agricultural Development
IMS: Intermediate Means of Transport
KG: Kilogram
KM: Kilometer
LDC: Least Developed Countries
LHWP: Lesotho Highlands Water Project
LIFDC: Low-income and Food Deficit Country
MRL: Minimum Residue Levels
NACP: National Aids Control Programme
NAFU: National Farmers' Union
NIE: New Institutional Economics
NGO: Non Governmental Organization
UNDP: United Nations Development Programme
SADC: Southern African Development Community
SPSS: Statistical Package for Social Sciences

CHAPTER 1

INTRODUCTION

1.1 Background to the study

Lesotho is a resource poor country that is continuously registering a slump in the economy resulting in high rates of unemployment. Like all countries, Lesotho has experienced episodes of economic growth and decline since independence. Between 1980 and 1989, the economy grew by 4.2% and between 1990 and 1997 it grew by 5.2%. In 1998, the political upheavals saw a closure of nearly 400 businesses and a loss of about 6000 jobs resulting in an economic decline of 5.5% (Mosenene, 1994).

Moreover, changes in global gold market prices have influenced South Africa to restructure its mines leading to a marked increase in the number of male Basotho retrenched from mine jobs in 1999 causing a rise in unemployment (Mbetu and Tshabalala, 2006). The linked currencies of Lesotho and the Republic of South Africa, and the de facto open border also imply that price levels of goods in Lesotho are often determined in South Africa and are frequently more dependent on South Africa's policies and economy than on those of Lesotho (Van Zyl et. al., 1996). These factors were the biggest contributors to the declining socio-economic situation in Lesotho.

The country's agriculture has been on the decline for several years and this situation is attributed to soil erosion, poor agricultural practices, frequent droughts, increased cost of farming inputs and its relative openness to external influences. The most important policy today concerns dealing with the country's deteriorating food security situation. It is difficult to recall that Lesotho ever produced an agricultural surplus and that the country was a net exporter of maize until 1865 (Gill, 1993). The Prime Minister of Lesotho, Professor Pakalitha Mosisili recalled the time following the discovery of diamonds in Kimberly (Capital of the Northern Cape Province of South Africa) in 1866, when Lesotho earned the reputation of being the Granary of Southern Africa. At that time, Lesotho was the major supplier of wheat to meet the unprecedented demand for grain for the population that had come into sudden wealth (Government of Lesotho, 2005). This unfortunately seems to have been

short-lived as hostilities from the Boers intensified, culminating in the destruction of the grain farms of Lesotho, eventually chasing farmers out of the fertile lands to the west of the Caledon River (Peires, 1993). By the mid-1980s, the country was only able to produce 14% of its domestic food requirement (Government of Lesotho, 1996). By the early 1990s to the early 2000s, the situation had taken a turn for the worse as the country imported as much as 95% of its domestic food requirements (Van Schalkwyk, 2002). At the same time, prices for bread and cereal rose by 14% between Jan and Feb 2002. For instance, an 80 kg bag of maize was priced at twice its price in 2001 (World Food Programme, 2009). The global food crises that came to a head in 2007/2008 have made the situation in Lesotho even more precarious (World Food Programme, 2008).

Despite this gloomy picture, Lesotho has often been described as a predominantly agricultural country and especially in the early decades after independence, it was still common to refer to agriculture as the “backbone of Lesotho” (Turner, et.al. 2001). The sector employed about 86% of the population during most of the 1980s (CIA, 2010). While the figure fell after those years, as much as 23% of the rural population still depends on agriculture for survival and 32% regard agriculture as a secondary source of livelihood (GoL, 1996). Thus, it is not desirable to write off Lesotho’s agriculture as irrelevant to the country’s long-term development. Furthermore, neglecting agriculture in a country like Lesotho with virtually no non-agricultural sector has turned out to be a huge mistake. Unemployment rates are currently put at 45% (CIA, 2008); while the food crisis facing the country has been so devastating it has sent the entire community into a panic.

The production problems of Lesotho’s agriculture or the supply-side questions are complicated by the constraints in both the internal and external market. The country’s negative terms of trade for its agricultural products remain disturbing and can be linked to the weak internal marketing systems (Directorate SADC Secretariat, 2008). The internal road network and other infrastructure continue to pose serious challenges to the easy movement of agricultural produce within the country, creating a situation where it is cheaper to import from South Africa, thereby depressing the domestic farm sector. Efforts to reverse the foregoing situation are dominating public policy management in Lesotho. Technical assistance by international

development agencies such as the United Nations Development Programme (UNDP), the Food and Agricultural Organisation (FAO) and the World Bank is focusing on poverty alleviation with emphasis on agricultural support. These organizations are working with the government of Lesotho to revitalize the agriculture sector.

In addition to the work of the government and multilateral institutions, a number of non-government organizations (NGOs) are quite active on the ground. An NGO such as CARE Lesotho for instance, is working hard towards helping farmers who are facing this difficulty of survival in a lot of ways including the establishment of programmes like the facilitation of sharecropping; attention to the basics of sustainable and profitable crop and livestock production; and more significantly, the maintenance and upgrading of health and nutritional systems (Ali and Abedullah, 2002).

This scenario is seen in another developing country called Karnataka, where the NGO is playing yet another significant role, that is, in HIV/AIDS programmes. Karnataka is designated as a “High Prevalence State”. AIDS prevention and control measures were initiated in that country in 1987 and an AIDS cell was established in the Directorate of Health and Family Welfare services in 1992. Under the National Aids Control Programme-II (NACP-II) a key aspect of the HIV prevention strategy has been adopted through evidence based design. The target intervention through NGOs is a very crucial component of NACP-II. Thus the Karnataka AIDS society is working with the help of NGO partners in preventing HIV/AIDS. NGOs are working on varied themes like i) care and support centres ii) preventive programmes iii) women in prostitution iv) homosexual men and v) legal approaches to issues raised by HIV/AIDS in the field of interventions (Veeramatha, 2005).

The completion of a major hydropower facility in January 1998 also expanded job opportunities for many Basotho men. At the same time, it permitted the sale of water to South Africa which became a major source of budget revenue for the country as it entered the new millennium. As the number of mineworkers has declined steadily over the past several years, a small manufacturing base has developed based on farm products that support the milling, canning, leather, and

jute industries, as well as a rapidly expanding apparel-assembly sector. The latter has grown significantly mainly due to Lesotho qualifying for the trade benefits contained in the Africa Growth and Opportunity Act (The World factbook, 2008).

1.2 Problem statement

Studies show that institutional constraints have an impact on farmers' responsiveness to policy changes. Makhura (2001) suggests further that agriculture structural changes have been made in the past in an effort to promote increased production amongst farmers, but according to Kader (2002), emphasis was put on production, whereas little attempt has been made to improve marketing. Kitinoja and Kader (2002) supported this view that fewer resources have been invested in post-harvest development. They explained that whereas smallholder farmers are encouraged to grow high yielding varieties, they know little about packaging, storage, handling and analysing market indicators.

In addition, there is shortage of markets to absorb the products, low prices for the products, a large number of middle-men in the marketing system, a lack of effective marketing institutions to safeguard farmers' interests and rights over their marketable produce (e.g. Cooperatives), poorly developed mechanisms for coordination among producers to increase their bargaining power and insufficient transparency in the market information system (Emana and Gebremedhin, 2007). This has led to farm-gate sales amongst smallholder farmers where prices are too low to sustain the farm enterprise. This is illustrated by the fact that in Lesotho, 15 years after the potential commercial profitability of asparagus production was established (EFP, 1995), little or nothing is happening in that direction.

After some half-hearted attempts to revitalize the company several years ago, activities seem to have slowed to a halt with virtually no marketing taking place at the moment. This leaves no doubt that institutional constraints could be holding the country back. Marketing agricultural produce is important amongst smallholder farmers because households derive benefits such as income and rural employment through it (Ngqangweni, 2000). Marketing activities such as processing,

transportation and selling can provide employment for those willing to exit the farming sector.

1.3 Research objectives

The objective of this research is to identify institutional factors constraining production and marketing of horticultural products in Lesotho. Specifically, the research will;

- Investigate institutional factors that affect horticulture production and marketing in Lesotho.
- Determine the impact of these institutional factors on the production and marketing of horticulture products in Lesotho.
- Make recommendations for a new policy on the basis of the results.

1.4 Scientific significance of the study

This research investigates the institutional factors that influence production and marketing among smallholder farmers in Lesotho. The study was carried out in four districts because the smallholder farmers in these districts are facing a different set of difficulties from the others.

In the past changes have been made in agriculture, but according to Kader (2002), emphasis was put on production, whereas little attempt has been made to improve marketing. Smallholder farmers had been encouraged to grow high yielding varieties, when they know little about packaging, storage, handling and analysing market indicators. This has led to farm-gate sales amongst smallholder farmers (Kader, 2002). As a result of the limited attention that the public research institutions have given to horticultural crops, yield increases of other crops have outstripped yield increases in horticulture crops. Moreover, attempts to expand the scale of horticultural production are often hindered by a lack of market access, market information, and many biological factors (Weinberger and Lumpkin, 2005).

1.5 Outline of the dissertation

This dissertation is organized into 5 chapters. The first chapter provides the background, the problem statement, objectives, and motivation for the study and its scientific significance. Chapter 2 reviews the literature which focuses on institutions of horticulture production and markets, stressing specifically their importance. Chapter 3 presents the discussion of the research methodology including a description of the study area as well as a brief history of Lesotho, its location, geographic features, and its economy. The methods used in the selection of the study area and sample are then described. This is followed by a description of the data collection procedure, and the probit model description. Chapter 4 presents and discusses the empirical results on the impact of institutions on production levels and other measures of sectoral performance. The last chapter, 5 presents the summary and conclusion and offers some policy recommendations.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter reviews the literature in an effort to explore the theoretical foundations underpinning the subject matter of the study; the current and past debates surrounding the production and marketing of the horticulture products and the institutional factors affecting the sector, highlighting particularly the specific constraints. As already mentioned in the previous chapter, 85% of the people in Lesotho live on agriculture in the rural areas and the majority of this population operates backyard gardens where families could increase production by intensive farming and horticulture which contributes about 10 percent to the national GDP (Chakela 1997). The review will touch on these issues and show the implications for the current and prospective performance of the horticulture sub-sector in Lesotho.

After harvest, due to spoilage and inability to access markets because of the impact that the institutional factors have on the horticulture sector, a substantial amount of horticulture produce is often lost. Because small scale farmers do not participate in the formal market, it is difficult for them to even shift into commercial farming. This hinders their economic development and lowers their production incentive.

Moreover, the production of major horticulture crops reveals that both output (i.e. production) and productivity have been erratic. This has, therefore, led to the identification of institutional factors that influence production and marketing of the horticulture products (Nakai, 2008). The chapter starts by drawing attention to institutions and how they influence horticulture production and marketing. The importance of horticulture in Lesotho will also be reviewed. Finally, the literature is reviewed in respect to the approaches adopted by researchers to investigate institutional constraints in smallholder agriculture.

2.2 Institutions in horticulture production and marketing

2.2.1 Institutions defined

Institutions are a set of formal (laws, contracts, organizations, markets) and informal rules of conduct (sociological trends, traditions, religions) that facilitate coordination or govern relationships between groups or individuals; to be discussed in the next section. Institutions are devised to structure political, economic and social interactions and they create order and reduce uncertainty in an exchange (North, 1990). Together with the standard constraints of economics they define the choice set and therefore determine transaction and production costs and hence the profitability and feasibility of engaging in the economy. According to Uphoff (1993), institutions are complexes of norms, rules, and behaviours serving a collective purpose (Nkosi et.al. 1994). See the outline below (Williamson, 2000)

1 Informal rules:	General
Customs, traditions, norms, beliefs, religion	
2 Formal rules:	
Legislation and legal system (judiciary), political system, bureaucracy, regulations	↓
3 Governance structures / institutional arrangements:	Specific
Forms of organisations, contractual arrangements	

Figure 1.1: Levels of institutions

Source: Adapted from Williamson, 2000

The major focus of the literature on institutions in this study though, has to be on the influence of institutions as problems of or constraints on horticulture production and marketing in the competitive framework. North (1990) posits that institutions are the underlying determinants of economic performance and shape the organisation of market transactions. North (1990) further explained that institutions provide for more certainty in human interaction. In marketing, institutions together with the technology employed determine the costs of transacting, which, in turn, determine the State's economic performance (Kherallah and Kirsten, 2001). Thus, market

exchange, franchising, and vertical integration should be conceived as efficient solutions to the complex problems confronting horticultural producers under various conditions. It is also important to use ideas from the study of New Institutional Economics (NIE), a multidisciplinary field that includes aspects of economics, sociology, business organization, law etc. Williamson (1975) introduced this term in an effort to differentiate NIE from old institutional thoughts because the NIE covers both economic theory and institutions.

NIE is a new direction of economics that considers that the cost of transacting which is determined by institutions and institutional arrangements is the key to economic performance. It also focuses on the historical process of a country's institutional change (North, 1990), economics of property rights (Demsetz, 1967) and the transaction cost economic theory of the firm (Williamson, 1985). NIE's goal is to explain what institutions are, how they arise, what purposes they serve, how they change and how - if at all - they should be reformed (Klein, 1999). NIE operates at two levels; the macro and the micro levels (To be highlighted in the next sections). The macro level, deals with the institutional environment also referred to as background constraints or the rules of the game which establish the basis for production, exchange (marketing) and distribution and guide individuals' behaviour (Klein, 1999).

This affects the growth and performance of the economy in a country. The micro level or the institutional arrangements deals with institutions and performance and the modes of managing transactions, niche markets and hierarchical modes of contracting. This level governs the ways in which producers/farmers cooperate or compete (Williamson, 2000). Delgado (1999) defined institutional constraints as the conditions under which individuals are permitted to undertake certain activities. He further identified some institutional constraints which are common to smallholder farmers in marketing. These include high transaction costs that result from the lack of adequate market information, lack of grades and standards and insubstantial legal environments governing property rights and contract enforcement.

2.2.1.1 Formal rules

Formal rules refer to laws, regulations or other forms of codified (explicit) prescriptions of what individuals or organisations may or may not do. There are different formal rules with different functions. But basically, from an economic point of view, formal rules promote exchange by (i) supporting exchange, i.e. the negotiation of agreements, or contracts between agents and (ii) protecting property and persons. The set of formal rules is sometimes also referred to as the institutional environment. Economic growth through the growth of specialisation and exchange in an economy depends on the evolution of the institutional environment. When the institutional environment does not sufficiently support the protection of property and impersonal exchange, the economic system becomes a local barter in economies where goods and services are exchanged primarily through face-to-face transactions between individuals who are related through some form of family, religious or ethnic bonds (Eaton and Meijerink, 2007).

2.2.1.2 Informal rules

Informal rules and norms are even more elusive than formal ones, as they are not written down, and are often hard to observe and are almost invisible. They have certainly not played a role in most economic analyses because of this. However, they can play a decisive role in determining the success or failure of economic enterprises, such as markets. Informal rules are all the implicit rules, customs, norms, practices, and habits that are more or less followed by a certain group or society. Simply put, it is a “way of doing things”.

Often “social capital” is seen to mean the same as informal rules. Social capital refers to “features of social organisation, such as trust, norms, and networks, which can improve the efficiency of society by facilitating coordinated action”. However, social capital does not always contribute to improved efficiency of society, as organised crime for instance can also be characterized by a high degree of social capital. Sometimes these informal rules are called “social institutions” (Eaton and Meijerink, 2007).

2.2.2 Institutional environment

The institutional environment forms the framework in which human action takes place. North 1990 writes, “Institutions reduce uncertainty by providing a structure to everyday life”. Moreover, institutions in the jargon of economists define and limit sets of choices of individuals i.e. individuals are prohibited from doing and sometimes, under certain conditions, individuals are permitted to undertake certain activities (Klein, 1999).

2.2.3 Institutional arrangements

Institutional environment is a NIE term which focuses primarily on agreements made by specific individuals to govern their own relationships. Williamson 1996b calls these institutional arrangements the institutions of governance which include contracts and organizations and in particular, the business firm. Though in comparison the study of institutional arrangement is more prosaic than that of the institutional environment, it is however important to mention that, institutional arrangement in particular the theory of the firm- is arguably more developed than the study of the institutional environment (Klein, 1999).

2.3 Institutions with horticulture production and markets

Institutions are significant in explaining how fast nations grow and how widely growth benefits are shared. Generally, institutions provide the incentive structure of economic activity and they also determine transaction and transformation costs (North, 1990). The following sections therefore discuss institutions found in horticulture production and marketing in Lesotho.

2.3.1 Institutions and horticulture production

The post harvest losses of horticulture products range from 30% to 40 % because of their high perishability which is one of their characteristics. Also, horticulture production declines because of the high costs of production (Seeds and chemicals etc). Moreover, small-scale horticulture producers have limited access to fertile land

and irrigation water. Production is further constrained by the prevalence of pests and diseases that cause losses (Mhazo et.al. 2003). In countries such as Kenya, the smallholder producers constitute about 60% of all horticulture producers and produce about 55% of the exports. However, ecologically suitable land is unavailable, as 80% of the country is arid and semi arid land (ASAL). The remaining 20% of the land is under cultivation, or covered by forests, buildings and roads. Considering that good land is scarce, there is need to invest in horticulture under irrigation system with medium level technology (Loulseged, 2007).

In Eastern Ethiopia on the other hand, horticultural production is concentrated in the lowland areas, where most households produce vegetables, with a quarter of those surveyed growing fruits. Most vegetable producers rely on irrigation during the dry season when prices are high (Emana and Gebremedhin, 2007). High fertilizer and animal manure intensity is used. About a third of vegetable producers rely on local varieties, as improved varieties needed to produce the desired product are unavailable. There appears to be some adulteration of inputs which affects the germination qualities of seeds and the efficacy of pesticides (Emana and Gebremedhin, 2007).

In Lesotho, however, though there is high dependence on horticulture, the sector is not an adequate and reliable source of food requirements. Even for those who have adequate land, home grown food often lasts for less than five months of the year, even in good years (Mphale and Rwambali, 2001). Competing land uses and a growing population have pushed farmers onto marginal lands, while prime agricultural land has been taken over by settlements.

Cereal production has increased but the rate of increase has been outstripped by the population growth. In spite of the increasing fragility of agriculture, there is still debate over whether Lesotho should aim to be self-sufficient mostly in horticulture production (Mphale and Rwambali, 2001). Moreover, this horticulture sector is dominated by smallholder farmers struggling to meet their subsistence requirements from year to year (Chakela 1997). However, this struggle has been marginalized by skewed climate extremes and hazards such as: hail, frost, and extreme temperatures.

These climate hazards are projected to be more severe under climate change conditions (Chakela 1997).

2.3.2 Institutions and Markets

Markets are an economic activity or a way of organizing exchange between people (Eaton and Meijerink, 2007). The role of markets in horticulture production and economic development of a country has prompted market reforms across a number of developing countries (Gabre-Madhin, 2001). Markets are grouped into informal and formal. Informal markets embrace direct unofficial transactions between farmers and consumers.

On the other hand, formal markets have clearly defined grades, quality standards and safety regulations and formally set prices (Kherallah and Minot, 2001). According to Mangisoni (2006), smallholder farmers are constrained in marketing by high transaction costs, high risks, missing markets and lack of collective action. In general, attention to markets has focused either on how markets can work more efficiently, or on how to improve opportunities for poorer farmers to participate in markets, sometimes also termed market access (Eaton and Meijerink, 2007).

In particular, this addresses concerns about the obstacles facing small scale farmers to be integrated into markets that require ever higher safety and quality standards, as well as larger volumes, and that are increasingly organised through vertical coordination mechanisms. These trends are visible not only in export markets, but also in national markets in developing countries where supermarket chains, for example, are increasing their market share. Very few markets in developing countries can be represented in a simple manner, but markets including those that are important for agriculture, such as markets for credit, labour, produce, have much more of a network-like structure (Eaton and Meijerink, 2007). See the figure below.

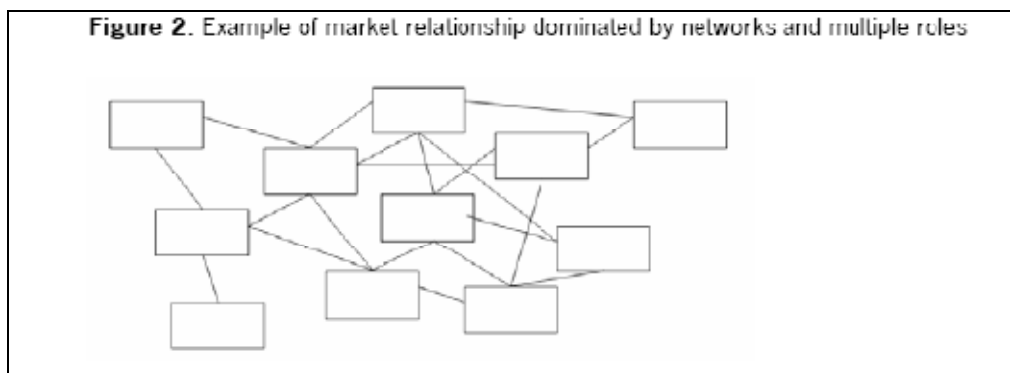


Figure 2.2 Example of market relationship

Source: Eaton and Meijerink, 2007

Adoption of improved and validated processing technologies of horticulture products, a good standard of quality produce and hygiene may assist horticulture producers overcome some of the problems experienced in markets such as lack of market information and market integrations, reliance on spot markets, transport constraints and wastage. However, there are a number of institutional factors that may constrain the horticulture producers to effectively market the products.

On a macro-level, policies implemented by governments have served to hinder the development of horticulture sectors (Gabre-Madhin, 2001). At the firm level, limited access to credit, the lack of appropriate technologies, the lack of technological capability, the unreliable supply of inputs and the lack of management know-how have served to constrain the development of the horticulture sector. These problems apply to many developing countries and are particularly applicable to Lesotho. Accessing appropriate packaging material for processed products is another constraint in marketing of the horticulture products especially for farmers with a market focus (Mhazo et.al. 2003).

In this regard, marketing in Lesotho is mostly informal and the majority of consumers rely on the local informal markets which are small and unreliable with seasonal erratic demand. These result in the lack of marketing skills and information, little knowledge about consumer preferences regarding taste and packaging for example. Unreliable transport in Lesotho is also a major hindrance in delivering the produce to the market (World Health Organisation, 2009). According to the NIE approach, the unit of analysis is the transaction rather than the price.

Exchange itself is costly. Transaction costs, which are distinct from physical marketing costs such as those for transport and storage for instance, arise from the coordination of exchange among market actors (Hoff and Stiglitz, 1990).

2.4 Importance of horticulture production in Lesotho

Poverty in Lesotho is on the increase. It is closely linked to severe land degradation, lack of income and unemployment. It is deeply entrenched in the rural areas, where about 85 per cent of the people live. More than half of rural people are poor, and more than one quarter of them are extremely poor. The dramatic drop in remittances from migrant laborers in South Africa has thrust many rural households deeper into poverty adding to the economic problems in the country. As demand for migrant labour declined and unemployed migrant workers returned to Lesotho, remittances shrank from about 60 per cent of gross domestic product (GDP) (IFAD, 2001). Some people, especially younger women, have been able to find employment in the country's new industries, mainly in urban areas. Thus, crop production became one of the most important components of survival systems throughout all livelihood zones of Lesotho.

Agriculture, especially horticulture, employed people than any other sector in the country. It constitutes a major source of cash income for the households and an opportunity to increase smallholder farmers' participation in the market. This sector is mostly dominated by smallholder farmers struggling to meet their subsistence requirements from year to year (Chakela 1997). The importance of it is seen in many different areas, where it is highly important in providing economic value to local communities and to the entire country, as this industry creates jobs for both those who are jobless and those who want to be self employed. Moreover, horticulture products provide high-quality foods for people and provide nutritional security to the people. This gets to be more acknowledged and significant in the face of people who are faced with the HIV/AIDS pandemic. An increase in aesthetic pleasure that supports psychological well-being is also an added advantage of horticulture production and improving the productivity of land (Chakela 1997). Below is a figure showing one of many horticulture fields in Lesotho.



Figure 2.3 Horticulture productions
Source: Ministry of Natural Resources, 2000.

2.5 Horticulture markets and marketing in Lesotho

In Lesotho, agricultural marketing has been identified as one of the priority areas for improvement and it is also seen as playing a major role in economic development. Horticultural markets and marketing channels (an organized network of agencies which link producers to buyers, performs sales, advertising and promotion, influences the firm's pricing strategy and affects product strategy through branding and policies;) are a useful tool for management (Combs & Hunter, 1987). Horticulture marketing includes all the activities involving the transportation, storage and processing, and arranging the movement of the products and commodities to the consumers (Girdner, 2008).

In the light of the above, marketing of horticulture products should be an essential factor with the following topics included: understanding marketing principles, use of market information, and market strategies for small-scale horticulture producers, market research, pricing, market infrastructure planning and provision, grading and quality control (Turner, 2001). Markets in developing countries reflect attempts to establish appropriate government responses to the inefficiencies created by incomplete and constraining institutional and physical infrastructure and imperfect competition.

Without institutions, the promise of efficient markets goes unrealized. Well-functioning markets ensure that the sectoral policies improve the incentives and lessen the constraints faced by the producers. On top of that, markets aggregate the demand and supply of products. These same markets also play a major role in managing risk associated with demand and supply shocks and reducing price variabilities faced by consumers and even producers themselves (Barrett and Mutambatsere, 2005). Thus, Barrett and Mutambatsere (2008) believe that markets perform multiple variable functions: distribution of inputs (seeds and fertilizers), and outputs (crops and animal products) and transmitting information to name a few.

But, the micro-level realities of the horticultural markets in Lesotho however, include poor communications and limited infrastructure, restricted access to finance, all of which make markets less effective. Added to these realities are the inefficiencies resulting from incomplete and unclear property rights. The majority of the Basotho population depends on horticulture for their survival and their major source of income comes from its productions. During the 1970's however, the marketing of crops rested largely in the hands of private traders. In 1973 the government of Lesotho established two parastatals, namely, the Produce Marketing Corporation and the Livestock Marketing Corporation. The introduction of these parastatals resulted in the private traders' being diminished and only being involved in the agricultural marketing system as agents of the parastatals (Mochebelele et.al., 1992).

2.6 Institutional factors in horticulture production and marketing

This section of the chapter reviews the literature with particular reference to the institutional factors that play a role in the production and marketing of horticulture both globally and in Lesotho. On the basis of international experience and empirical work elsewhere (Haji, 2008), the review in this section focuses on transaction costs, market information flows, grades and standards, institutional environment, property rights, farmer organizations and contract farming. The review has been extended to include the issue of transportation and storage which are strongly influenced by the

institutional environment in the light of international consensus about the crucial institutional aspects of transit systems (Lam and Miller, 2002).

2.6.1 Transaction costs

In developing countries, transaction cost economics is relevant for agricultural market analysis and changes in the agricultural sector. Watkins (2009) in his articles says,” In order to carry out a market transaction, it is necessary to discover who it is that one wishes to deal with, to conduct negotiations leading up to a bargain, to draw up the contract, to undertake the inspection needed to make sure that the terms of the contract are being observed, and so on” (North, 1990). More succinctly therefore, transaction costs are:

- search and information costs
- bargaining and decision costs
- Policing and enforcement costs (Coase, 1937).

High transaction costs are an embodiment of a market access barrier among resource poor producers. These high transaction costs are a result of individual transportation and selling of produce which may even result in producers ceasing produce marketing because of a lack of incentives. Makhura (2001) says high transaction costs prevail among small holder farmers. As Sykuta and Chaddad (1999) point out, every exchange involves each of these costs to a greater or lesser extent, with each transaction cost item being influenced by social institutions (norms of behavior), legal institutions (definition and enforcement of property rights), political institutions (mechanisms by which property rights are allocated), and economic institutions (availability and efficiency of markets).

2.6.2 Market information flow

In horticultural production, access to market information is an important determinant of market participation. If buyer and seller do not have proper information about the item to be exchanged, a “lemons market” may arise (Spence, 1973; Rothschild and Stiglitz, 1976; Akerlof, 1970). This kind of economic situation “lemons market”, occurs when the seller knows more about a product than the buyer and George Akerlof (1970), explained how the pressure of competition may also cause quality to

deteriorate to such low levels that the market may fail to exist. Many smallholder farmers in developing countries still do not understand markets, how they work and why there are price fluctuations in the markets. The reason is that, producers have little or no information at all on market conditions and prices, moreover, they are not organized collectively and have no experience in market negotiations (IITA, 2001; Freeman and Silim, 2001; Heinemann, 2002). It is also indicated that at other times their primary source of market information is the market place itself, as well as conversations with neighbours and traders (Grain Market Research Project, 1996). In addition, farmers relying on informal networks for market information are at risk of getting biased information because of the opportunistic behavior of more informed groups. Mangisoni (2006) explains that, smallholders accept low prices for their crops when brokers inform them that their produce is of poor quality.

This happens because smallholders are unable to negotiate from well informed positions. Market-supporting institutions should ensure that competition is fostered and that information flows smoothly (McMillan, 2002). Makhura (2001) also adds that, the proximity to markets reduces variable transaction costs in horticultural markets. In his study, with every kilometer closer in proximity to markets, the horticultural sales increase by R152 (Makhura, 2001). Good road conditions also reduce transaction costs. IFAD (2003) also states that, market access can be considered according to three dimensions: Physical access to markets (Distance, costs, etc.); Structure of the markets (Market intermediaries and consumers, Relations between the farmers); and Producers' lack of skills, information and organization (Understanding the market, prices etc).

2.6.3 Grades and standards

There is an increasing demand for processed fresh food products that are safe to eat. Today, consumers demand sort, standard, safety and packaging. Food products such as fresh fruits and vegetables are highly prone to food safety risks and therefore, their food standard is increasingly stringent. These food quality standards and safety demands are highly pronounced in developed countries, negatively affecting traders from the developing countries (Meijerink and Roza, 2007). Most horticulture crops have no defined grades and standards and therefore they cannot meet consumers' demands (Reardon and Barrett, 2000). This is because producers lack the

technology, knowledge and resources to achieve such requirements. A lack of standardization results in prices that are difficult to compare and a lack of grades and standards is a key factor in the market behavior of producers (Gabre-Madhin, 2001). On top of that, institutions determining market standards and grades are poorly developed in the smallholder farmers' environment. This therefore means that, only well organized producers will benefit from trade by adopting quality control measures and obtaining certification for their goods (Reardon and Barrett, 2000). Therefore, producers in the agriculture sector have to shift from a philosophy of "here is what we produce" to a situation where farmers would take note of what consumers want (Schrader, 1986).

2.6.4 Institutional environment

This is the macro level of the New Institutional Economics (Williamson, 2000). So, for development to proceed, producers need to trade between communities and the wide national and international economies. This requires an institutional environment and an institutional arrangement that are effective in reducing transaction costs and risks of complex and distant forms of trade and property rights (Morrison et.al. 2000). Smallholder farmers lack lobbies in the legal environment and as a result, trade only prospers where trust has been developed based on transactions or informal relationships (Randela, 2005). Thus, unfavourable legal environments create barriers to entry into formal trade and limits participation by small producers in the modern marketing system (Randela, 2005).

2.6.5 Property rights

In the opinion of Demsetz (1967), property rights are the capacity to use or control the use of an asset or resource. For any form of cooperation to be workable, especially those involving agreements, it requires clearly defined and enforceable property rights. Adam Smith cited by Sinisi (1999) recognized that the state must define property rights and enforce contracts. Dorward and Kydd (2004) believe that when incomplete property rights impede the functioning of markets, market players fail to undertake the profitable investments leading to coordination failures that hinder market functions (Dorward and Kydd, 2004).

2.6.6 Farmer organizations

In developing countries such as Lesotho, farmers should form organizations. This is an institutional arrangement which helps those smallholder farmers who lack resources, income, and market to get things done in their farming sectors. Smallholder farmers working as individuals usually face problems of getting inputs and markets for their produce but in an organization, they gain a bargaining position and also benefit from a reduction in transaction costs (Olson, 1971). Farmer organizations are also a tool to avoid and overcome free rider problems and come up with cooperative solutions for the management of resources. In other words, farmers work together in this situation of collective action. These organizations thus, need to have the same purpose and homogeneity (Olson, 1971).

Traditionally, cooperatives are involved in three main areas of business: (1) the purchase and sale of agricultural inputs and equipment; (2) the purchase, storage and subsequent sale of agricultural commodities; and (3) transport services (Piesse *et al.*, 2003). Unfortunately though, lack of organization, cooperation and collective action among smallholder producers deny them entry into the formal market channels.

2.6.7 Contract farming

In many poor African countries, smallholder producers say the reason that they cannot improve their productivity is the difficulties they face in accessing markets and agricultural inputs (Heinemann, 2002). Heinemann defends this view, saying that a major reason why these farmers are trapped in this cycle of problems and constraints is that they do not have contracts. Contracted producers have an advantage, in that they have pre-arranged markets and prices before their produce is harvested and readily available inputs. Under contract farming, a trader contracts with a farmer to buy a specific quantity and quality of produce at a designated price and time. The price may be fixed at planting time or determined at harvest time. In many instances, farmers benefit from access to technological information and extension services provided by traders. In some cases, traders also provide inputs on credit.

Contract farming reduces transaction costs and production and marketing risks by ensuring a guaranteed source of supply with specific quality requirements to processors and ensuring farmers an immediate market outlet for their produce as well as access to inputs (Roy, 1963).

2.6.8 Transport and storage

The majority of producers in Lesotho do not own a means of transport; they rely on what is called an intermediate means of transport (IMS) such as rented trucks, wheelbarrows, and head balance for taking their produce to the markets and transport to the input stores is also a problem as they have to wait for a particular person in the village who owns a vehicle (The Economic Intelligence Unit, 2004).

Added to the problems of transport is the weak storage infrastructure which leads to potentially high storage losses, with fruit and vegetables being vulnerable to damage from rodents, birds, and moisture. This inadequacy of storage, combined with the vulnerability of crops to damage, discourages many producers from engaging in horticulture production or producing more (The Economic Intelligence Unit, 2004).

2.7 Institutional constraints and problems

NIE economists (Douglas North, Oliver Williams, etc) do not only think about institutions, but they even see them as “constraints” on markets that create inefficient “rigidities”. For instance, according to North (1984), “institutions consist of a set of constraints on behavior in the form of rules and regulations; a set of procedures to detect deviations from the rules and regulations; and, finally, a set of moral ethical behavioural norms which define the contours that constrain the way in which rules and regulations are specified and enforced (North, 1984).

Many NIE theorists are, in fact, saying that institutions are there only because they improve efficiency (North, 1984). Poor management, lack of training, conflict among members, and lack of funds also appear to be some of the contributing constraining factors for horticulture producers. These challenges facing smallholder farmers in production and marketing usually result in a ‘low level equilibrium trap’ (Dorward

et al., 2005) as shown in figure below. The constraints, investment disincentives and the stagnant rural economy reinforce each other, leading to a reduction in market participation (Dorward and Kydd, 2005).

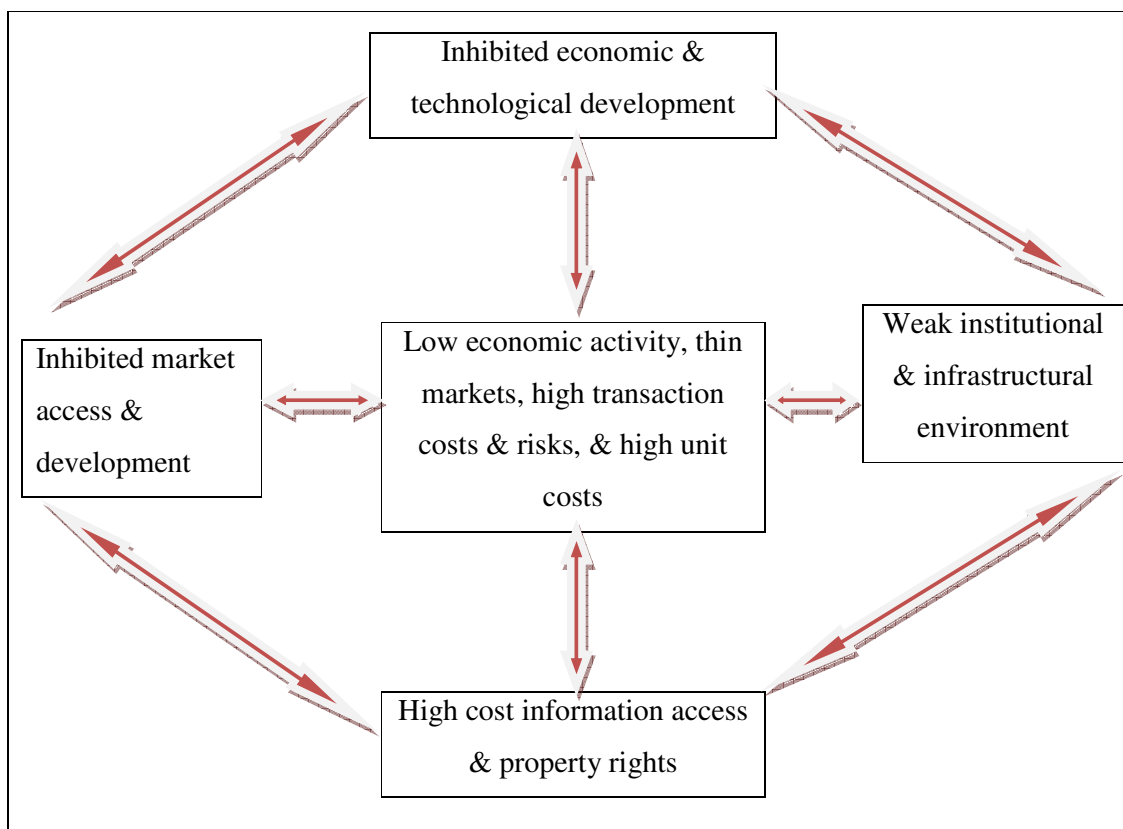


Figure 2.4 Low level equilibrium trap in smallholder farming
Source: Dorward and Kydd, 2005.

The low equilibrium trap is the low level of economic activity leading to thin markets, inadequate coordination, high transaction costs and risks, and high unit costs for infrastructural development together with a lack of concentration of resources in the same area, summed up in the figure above. Maxwell (2004) says that smallholder horticulture growth depends on competitive engagement with very demanding produce markets, and that small horticulture producers face transaction costs in these markets that are too high to be overcome even with the assistance of intermediaries. Two prerequisites necessary for successfully entering the horticultural value chain are consistency in supply and a recorded and demonstrated traceability of products. Unfortunately, only a small percentage of smallholders meet these requirements. There is evidence that small horticulture producers are gradually

being squeezed out of the lucrative export market for horticulture. It is argued that increasing concentration in European retail markets and rising concern over the environmental and labour conditions at the farm-level are pushing exporters to work more with larger farms (Dolan et al., 1999). Humphrey (2005) observes that the main issue is not whether small farmers can be integrated into marketing channels that meet challenges of public and private standards, but how this can be done in a cost-effective manner. Because costs of coordination and implementation may be very high, there may be a tendency to source from large-scale farms that are easier to coordinate.

Garbutt (2005) also argues that it is very difficult for the market mechanisms to bear the costs of training and capital investment that are required to bring smallholders into high-value chains. Supporting infrastructure is hardly developed, and should be given priority in public investment programs if smallholders are to access the horticultural value chain (Dolan et al., 1999). Horticultural farmers in Lesotho have limited access to factors of production, credit and information, and markets are often constrained by inadequate property rights and high transaction costs. The major constraint for producers and smallholders in particular is represented by logistical costs. Appropriate logistics play an important part in the overall export performance of a country.

Another major constraint faced by the horticultural sector concerns access to markets in developed countries. Most of the tariff peaks are in agriculture, and they escalate between raw and semi-finished or finished products, being much higher for more advanced stages of processing (Keynes, 1943). In addition, the other main barriers or constraints of institutions' perception of horticulture production and marketing are the risks and costs of adoption.

Conditions under which markets are efficient are quite restrictive even for resources, goods and services with private property characteristics (requiring, for example, a well-developed institutional environment for information flows, property rights enforcement, and low-cost, low-risk exchange of clearly-defined and standard goods and services) (Dorward et al., 2003). These are interrelated, as the risks of adoption would include the potential costs of making mistakes because of inexperience.

Lesotho, until today still uses its traditional ways of farming. The Machobane Farming System was developed by Dr J.J. Machobane in the 1970s, after 13 years of research on the agriculture management techniques that Basotho smallholder farmers were using. The aim was to provide resources to poor farmers with a sustainable system that did not require expensive inputs, was easy to implement, and supplied them with food all year around.

These traditional methods of agriculture result in low productivity hence their low margins of error and also because these methods have been refined and improved in the country through their use over many generations. Here, mistakes are less likely to be made in repeating familiar tasks than in applying new and unfamiliar ones. For example, to an inexperienced user of chemical herbicides, that method of weed control would be more risky than hand weeding, in the sense that the risk of damaging the crops would be higher (Ghatak, 1984). Similarly, in adopting new crop varieties which, under experienced management, is capable of out-yielding more traditional varieties, an inexperienced farmer might suffer a lower yield, or even a complete production failure due to mismanagement.

Added to the risk of adoption is the cost of adoption, where small horticultural producers, because of their poor performance, may require financial assistance but be afraid to apply for any, as many of them do not have the collateral which might be required in the exchange process. Furthermore, these producers are in the traditional sector and they may be refused institutional credit or they may have it offered to them only on terms they find unacceptable (Ghatak, 1984). On the other hand, there are also institutional uncertainties which include credit availability, delivery system for crucial inputs such as seeds, fertilizer and transport for the produce, extension services and overall technical support. The strengthening of the support services and technical know-how can help reduce these uncertainties to the level of risk.

Institutions have been established to create order and reduce uncertainty in exchange. Moreover, they provide the incentive structure for economic activity and they determine transaction and transformation costs, hence the profitability and feasibility in engaging in economic activity (North, 1990). But, they play a negative

constraining part in production and marketing of horticulture sector. The major question to be answered is how to create good institutions in order to minimize constraints. The current answer to that is; good institutions will lower transaction costs in production and marketing, and increase efficiency in economic exchange in the country. Good institutions are further based on clearly defined property rights and uncomplicated contract enforcements for producers.

This is only possible if the correct information is available and legal system is agreeable. Two tests are thus necessary; i.e. are the property rights of farmers secured and are the rule of law in that regard enforced? These can be achieved through government intervention.

Members of poor-performing cooperatives fail to understand clearly the purpose of cooperatives, how they function, and members' rights. Actors, particularly those with little financial and social resources or political leverage, face high (all too often prohibitive) costs in accessing information and in enforcing property rights. This stems from producers' lack of education, training, and information (Ortmann & King, 2006).

Table 2.1 summary of general constraints of horticulture production and marketing

Constraints of horticulture production	Constraints of horticulture marketing
Shortage of land, labour, and production inputs.	Multiplicity of actors and unfair competition between them.
Recurrent droughts and occurrence of pests and plant diseases.	Lack of markets to absorb all the horticultural produce.
Limited accessibility to improved agricultural technologies.	Lack of market information to forecast demand in order to plan production.
Poor packaging, sorting and processing which do not add value to the products	Horticultural products are harvested during the same period, increasing supply and forcing prices to decline.
Lack of skilled labour; smallholder farmers mostly rely on family labour and richer farmers with larger landholdings use hired labour	Unavailability of market facilities and infrastructure.
Farmers' skills, knowledge of production methods and product management are seldom backed by scientific recommendations, which affect the quality of products.	Inaccessibility of the production sites in the rural areas by car or truck.
Farming equipment is often traditional and archaic.	Handling and transportation are rudimentary and expose the products to weathering and physical damage and thus, to deteriorated quality and low prices
Storage facilities are rudimentary with no cooling or preservation systems.	Absence of norms and regulations for fair marketing for all stakeholders and for defining quality for price scaling.
Institutions are not in a position to adequately build the farmers' capacity.	No direct communication between wholesalers and producers; considerable role of middlemen
Quality inputs such as seed, fertilizers and pesticides are not always available from reliable sources.	Product flow is dictated by seasonal supply deficit.
Lack of group action amongst the farmers is too small to voice out their needs.	Suppliers are unable to meet the supply chain requirements.
No conducive policies and enforcement mechanisms are in place to encourage horticulture production	Lack of coordination among traders to increase their capacity to search for potential markets and control the activities of the middlemen and exporters

Source: Dry Land Coordination Group, 2007.

Table 2.2 Summary of institutional problems, constraints and suggested solutions

Institutions	Problems/ Constraints	Suggested solutions
1. Policy	Lack of operational policy and specific objectives	Balanced operational policy with realistic targets.
2. Planning	Lack of central agricultural planning organisation	Establish central agricultural planning authority directly responsible to cabinet.
3. Rural infrastructure	Poor water distribution, roads, communication etc.	Planned piped water, schemes, roads etc.
4. Inputs/Services	Lack of readily available inputs/services.	Establish rural service centers in various districts of the country.
5. Marketing/Prices	Lack of organized Marketing and price incentives	Marketing and pricing policy for major products.
6. Credit	Lack of credit facilities	Provide selective controlled credit.
7. Research	Lack of local agricultural research	Develop suitable applied research structures.
8. Extension	Ineffective and inefficient extension	Reorganize in-time bound Training and Visit System. Then, balanced use of communication channels.
9. Land tenure	Lack of security and negotiability of land rights. Uncontrolled communal grazing.	Registration and negotiability of arable land rights. Cooperative grazing schedules.
10. Development coordination	Uncoordinated rural development approach.	Decentralized control and coordination policy at District & regional level.

Source: Public Eye, 2008.

2.8 Institutional innovation

The principal tool for reducing transaction costs is institutional innovation. This notion has been the basis of much of the induced innovation model put forward by Ruttan and Hayami (1984) and a number of researchers since then. Innovation is necessary to overcome problems faced by farmers in horticulture production (Ruttan V.W, 2004). Four key innovation areas identified by Delgado (1999) are;

- ❖ A need for institutions to implement a net transfer of assets to small horticulturalists that provides an incentive for increased productivity.

- ❖ A need for institutions to share risks and fixed costs of providing agricultural services and inputs to small holders.
- ❖ Better access to remunerative (high value-added) markets through institutions that benefit from economies of scale in production, processing and marketing of high value tradable items. A wide variety of institutional arrangements govern the organisation of horticulture production.
- ❖ A need for institutions to provide relevant technical, management and market information to assist producers. On the other hand, collective action is, in many aspects, a logical route to farmer empowerment. By working together, farmers can identify members' needs and consolidate demand, aggregate members' economic power and address market failures (Hagedorn, 1992; Becker, 1983).

These capacities would seem to make farmers organizations the ideal partners in agricultural production. The belief is that, working with ad hoc research groups can provide valuable short-term results while working with formally established farmers' organizations such as NAFU should contribute to the long-term process of empowering farmers and thereby, eventually rendering of the entire horticulture sector more effective. An added advantage is that, working with farmers' organizations might provide a cost effective way of conducting on-farm research which, otherwise can be prohibitively expensive (Carney & Van Rooyen, 1996). Delgado (1999) analyses three main arrangements that have different abilities to manage transaction costs arising from their different links to production, processing and marketing.

Firstly, independent small holder operators with high transaction cost in production, processing and marketing. Secondly, small operators linked by contracts to processors or marketers by arrangements that may include contract farming, producer cooperatives which may facilitate access to assets, information services and markets. Thirdly, large commercial farms that are specialized and have some form of vertical link to processors and marketers. Types of institutional innovation required to enable horticultural producers to partake in markets will therefore depend on the type of transaction costs they face. For instance, contract farming as an institutional innovation, may help to reduce transaction costs, particularly for

high value-added products (e.g. horticultural products) and those with a high value-to-weight ratio (Ortmann, 2002). But, institutions that govern the “mode” of production can be induced to change in order to enable producers to take fuller advantage of new technical opportunities under favourable market conditions. A major source of that institutional change is an effort by producers to internalize the benefits of innovative activity to provide economic incentives for productivity increase. In some cases, institutional innovations have involved the reorganization of property rights to internalize higher income streams.

But, it is unlikely that institutional change will prove viable unless the benefits to producers exceed the costs. Changes in market prices introduce disequilibrium in existing institutional arrangements by creating profitable new opportunities for the institutional innovations (Eicher & Staats, 1990). The emerging paradigm for sustainable governance emphasizes systems approaches, adaptive management, incentives, collaborative governance, decentralization, communicative planning, and conflict resolution (Vella, 2003). However, in many cases, the delivery of these approaches in practice requires substantial institutional change and this must be based on a deeper understanding of the relationships between institutions and behavior.

2.9 Procedures for Assessment of Institutional Constraints in Smallholder Agriculture

A wide range of approaches to the analysis of the institutional constraints to smallholder development has been covered in the economics and development literature. The analytical framework has generally been linked to the researchers’ view on the role of institutions. The bulk of existing research view institutions as an input or resource in the production process. Many researchers assess the role of institutions by means of the sustainable livelihoods framework developed by the development community, including the United Nations Development Programme (UNDP) and the Department for International Development (DFID) (Dorward, Kydd, Morrison and Poulton, 2003). In this category of studies, Perret (2003) has carried out an assessment of rural livelihoods impact of the institution of traditional and non-traditional cooperation in a study of the communal wool producers in the

Eastern Cape Province. In the study, Perret (2003) also calculated gross margins of groups of wool producers as a means for decision about the impact of cooperation and farmer association on the production process. Many studies take an efficiency perspective and proceed to apply a wide range of efficiency measures to evaluate the role of institutions. Among these, the studies by D'Haese et al (2003) have generally taken an efficiency view of the role of institutions. In this respect, allocative and technical efficiency estimations have been used to measure the impact of particular institutional arrangement or institutional innovation. One study that compared the technical efficiency and returns on investment among farmers in the Luzie area has adopted the Data Envelopment Analysis (DEA) to determine the extent of allocative efficiency. Formal investment analysis based on cost-benefit analysis has also featured in such studies that take the non-parametric estimation approaches.

Another study by D'Haese et al (2003) conducted in the Transkei area to determine the income effect of marketing by communal wool producers has also assumed that institutions contribute to efficiency of the economic activities and undertook a series of regression procedures to identify the key factors to be taken into account. In that study, D'Haese et al (2003) fitted a probit model that adopted a binary dependent variable representing membership of a wool shearing cooperative. Ordinary Least Squares (OLS) techniques have been employed in the regressions where a continuous dependent variable (e.g. gross margins of the different groups) has been calculated, and its variations explained by a set of demographic and socioeconomic characteristics of the farmers, including the institutional variables identified in the production and marketing environment (D'Haese et al, 2003).

Apart from estimation procedures mentioned above, many researchers analyze the role of institutions by the case study approach and undertake descriptive analysis and case profiling to highlight the roles of the institutions at play. This approach has been adopted by Huylenbroeck and Espinel (2007) to analyze institutions and governance structures in Uganda, Ecuador. Several studies have used all foregoing approaches in various combinations depending on the particular setting encountered.

2.10 Chapter summary

The chapter reviewed literature on the institutional factors influencing production and of horticulture products in Lesotho. The challenges that farmers are facing with regard to institutional factors were discussed in detail. The discussion on institutional factors has led to the conclusion that these factors restrain opportunities for Basotho farmers and usually lead to an exit of these farmers from the horticulture business. The methodologies used by other studies to assess the role of institutions in smallholder agriculture in general and horticulture production and marketing in particular are also reviewed. To conclude, the literature has shown that in Lesotho, farmers are finding it difficult to participate in the horticulture production and marketing due to a number of institutional factors. These include high transaction costs, inability to meet grades and standards and lack of market information.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

Lesotho is a small country situated between Latitudes 28° South and 31° South of the Equator and Longitudes 27° East and 30° East of the Greenwich (Map of Lesotho, 2010). It is a geographic enclave completely surrounded by the Republic of South Africa (see the figure below). “The mountain kingdom” or “the roof of Africa” or “The Kingdom in the sky”, as it is called by virtue of its plateaus, hills, mountains and rugged terrain, covers about 30,340 square kilometers of the highlands ranging from 1,500 meters at its lowest level to 3,300 meters at its highest level. The country has a temperate climate with cool to cold dry winters and wet hot summers (Baffour, 2003).



Figure 3.1 Map of Lesotho’s enclave in South Africa
Source: Geology and Earth Science, 2005

The population of Lesotho is estimated at 2.2 million people (1996 Census) the majority of who earn their livelihoods from agriculture. An estimated 85% of this population resides in the rural areas. This group of Basotho is mostly engaged in an

informal occupation (Van Zyl et.al., 1996) and almost half of the nation lives below the poverty line. The informal occupation only accounts for a small part of the rural household income (World Bank, 1995). The major share of rural household income is derived from remittances from males who work in the South African mines (World Bank, 1995). Key factors behind rural poverty are a lack of access to resources, geographical isolation, causing a lack of access to services and markets, a lack of productive assets such as mechanized farm implements which constrain productivity and a lack of labour. The latter is a true scenario in Lesotho, as some family members are forced to work for other families thereby causing smaller yields on their own plots.

This chapter of the study gives a brief geographic, social and economic description of the study area. The second subsection of this chapter discusses the data collection strategies used in the study. In the last subsection variables as well as the model used in the analysis are discussed.

3.2 Description of the study area

Geographically, Lesotho is completely surrounded by, South Africa, to make it one of only three such entities in the world (the others are the Republic of San Marino, an enclave in Italy, and the Vatican City, an enclave in the city of Rome, also in Italy). It is divided into 10 districts, namely; Mokhotlong, Thaba-Tseka, Butha-Buthe, Leribe, Teyateyaneng (also known as Berea), Maseru, Mafeteng, Mohale's Hoek, Quthng and Qacha's Nek. All these districts are distributed across the different agro-ecological zones of the country. The following sub-section details the different districts where the study was carried out. The distribution is shown in the Map of Lesotho presented in Figure 3.1 above.

3.2.1 Location of districts where the study was conducted

The study was conducted in four out of the 10 districts of the country. These four districts are Butha-Buthe, Berea, Thaba Tseka, and Mafeteng. The first district was Butha-Buthe with an area of 1,767 km² and a population of approximately 130,000. The other one is Berea (also known as Teyateyaneng) with an area of 2,222 km² and a population of approximately 300,000 (Lesotho Bureau of Statistics, 2006). The Berea district is surrounded within Lesotho by three districts, namely Leribe, Thaba-Tseka and Maseru. The third district was Thaba-Tseka which has an area of 4,270 km² and a population of approximately 170,000. Thaba-Tseka is bordered by the following districts; Mokhotlong, Leribe, Berea, Maseru, Mhale's Hoek, and Quthing districts. Mafeteng, as the fourth study district, has an area of 2,119 km² and a population of approximately 330,000; it shares borders with the following districts; Maseru and Mhale's Hoek.

These districts are found in different agro ecological zones of Lesotho. Thaba-Tseka is in the mountain zone together with the Mokhotlong district. Teyateyaneng is in the lowlands with Leribe, and Maseru, while Botha-Buthe and Mafeteng are both in the foothills together with Mhale's Hoek. The last agro ecological zone, which the study did not cover, was the Senqu river valley and this zone is made of two districts namely; Quthing and Quthing's Nek. Below highlighted in red, is the map of the four districts where the study was conducted (Lesotho Bureau of Statistics, 2006).

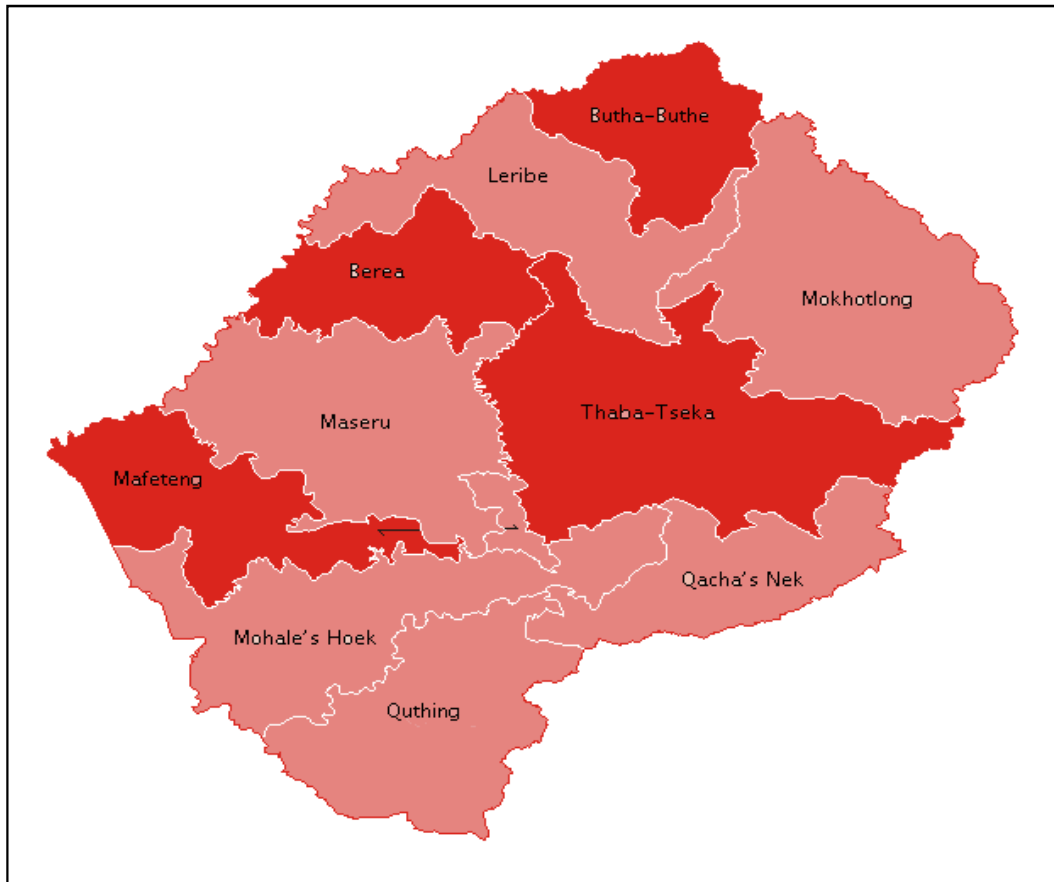


Figure 3.2 Districts where the study was conducted in red
Source: Lesotho Bureau of Statistics, 2006.

3.2.3 Geographic features and soil

On the basis of agro-ecological formation, the country is divided into four separate zones, viz, the lowlands, foothills, mountains, and the Senqu Orange river valley (See Figure 3.3 below for Agro-ecological zones of Lesotho).

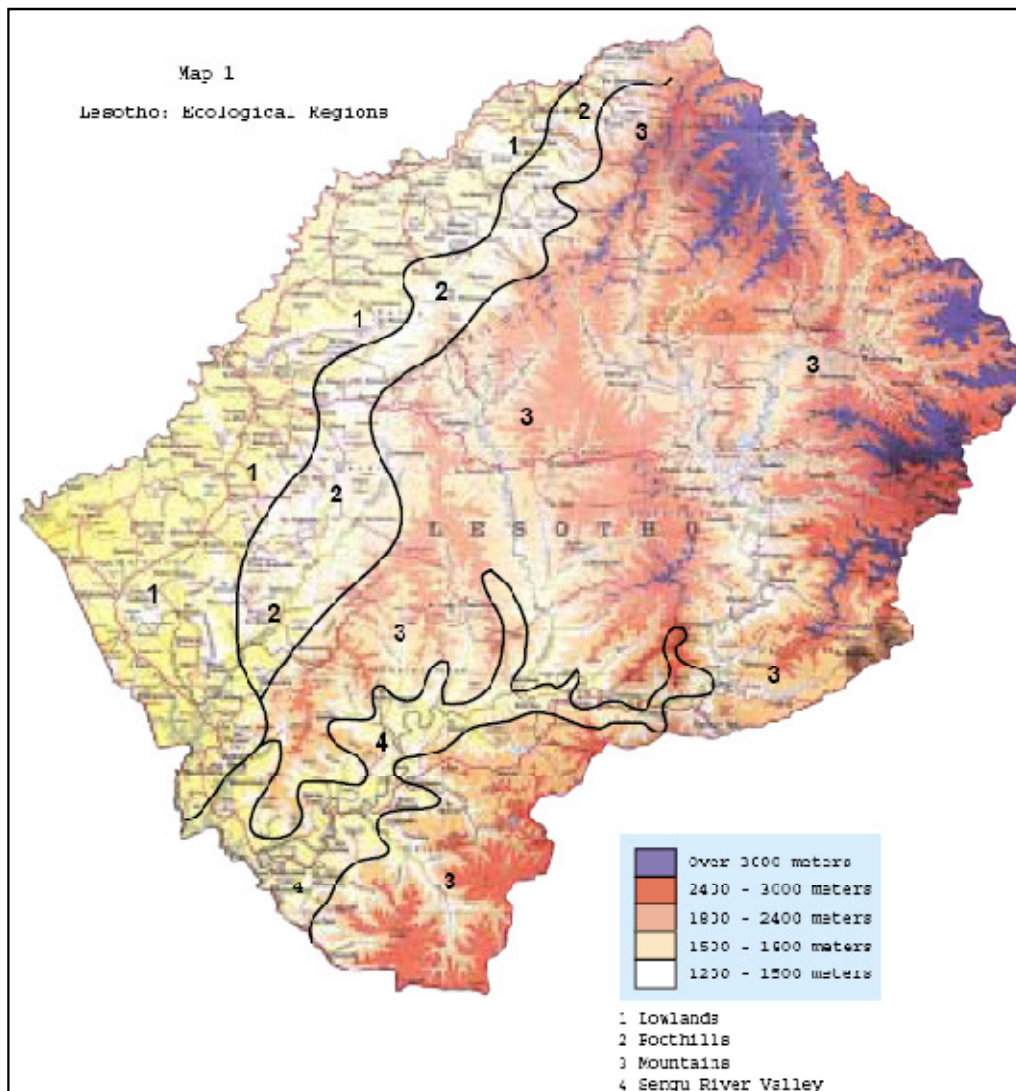


Figure 3.3 Agro-ecological zones of Lesotho.
Source: Ministry of Natural Resources, 2000

The lowlands and foothills cover about 30% of the country's land area and are characterized by presence of Duplex and Reddish soils that fall under the Alfisols group. These areas form the bulk of the productive arable land. On the other hand, the mountains in Lesotho and the Orange River are dominated by the dark soils known as Mollisols and these soils form the backbone of agricultural production. However, the Alfisols are intensively used for cropping (Rooyani & Schmitz, 1987). The importance of these lands geographical features to Lesotho determine the country's suitability for its agricultural activities. They also influence the adaptability and the distribution of different types of crops (Rooyani & Shmitz, 1987). The Kingdom is a low-income and food deficit country (LIFDC) but has

water, agriculture and grazing land, and some diamonds and other minerals as its natural resources. Some of the country's main products include asparagus, beans, livestock, maize, peas, pulses, sorghum, and wheat. The main exports are asparagus, beans, diamonds, mohair, peas, and wool. It has little industry, insufficient development capital and limited minerals and agricultural resources. Therefore, only about 10% of the country's land is suitable for agriculture and 86% of its people are engaged in subsistence farming (Baffour, 2003).

Crop production is divided among three major cropping systems namely cereal crop production, irrigation farming systems and horticulture production (Mosenene, 1994). In addition, most farmers raise livestock to supplement crops and maintain "food security" during drought years when crop yields are low. Animal husbandry is important everywhere and is often the only revenue source in the higher elevations. Sheep and goats that produce meat, milk, and very high quality wool and mohair are the most important animals (National Economies Encyclopedia, 2007).

3.2.4 Climate

Lesotho has sub-tropical to temperate climate of warm, wet summers to cold dry winters. During the months December and January, sometimes including February, there is a hot dry spell. This is fatal since it occurs when flowering occurs or fruit setting is initiated. Rainfall is erratic and also un-seasonal, thus the draught phenomenon has become a constant rather than an occasional incident. Rainfall is of a short duration but a high intensity. Frost is common and as indeterminate as hail storms. Because of its climate, therefore, it has been said that crop farming especially, is a rather risky business in Lesotho (Mosenene, 1994).

3.2.5 The economic situation

Lesotho, like all countries, has experienced various axes of economic growth since independence. By 1994, it was still classified as a least developed country by the World Bank (Mosenene, 1994). The country relies on remittances from miners employed in South Africa and customs duties from the Southern Africa Customs Union for the greater part of government revenue. As the number of mineworkers

has declined steadily over the past several years, a small manufacturing base has developed based on farm products that support the milling, canning, leather, and jute industries (The World Fact Book, 1998). The economy is still primarily based on subsistence agriculture whose contribution towards the GNP stood at 12% in 1994, a drop from 50% in the seventies.

Then, a period of good growth and stability from the mid 1980s to the mid 1990s occurred. In 1987 a structural adjustment programme was introduced and construction of the Lesotho Highlands Water Project (LHWP) began. It was then, between 1987 and 1997, that the annual growth rate was 6.2%. But there was a major fall in 1998 as a result of reduced migrant labour earnings, fewer imports for construction of the LHWP and the major economic destruction which was caused by the September riots. Lesotho has long been plagued by political unrest and violence. People generally live in poverty, social welfare and medical resources are scarce, and the level of education is low. Then on September 22, 1998, suspicions that the then ruling party had manipulated a general election two months earlier gave rise to an outbreak of rioting in Maseru, the capital town of Lesotho and other parts of the country.

Troops from neighbouring South Africa were sent in to crack down on the violence, causing a wave of anti-foreign sentiment. People looted foreign businesses and foreigners were expelled from the country. That was the year when the country's GNP dropped by 7.7% (Sechaba Consultants, 2000a). The GNP drop then led to a major crisis of poverty that resulted into a flood of "development" assistance. The primary concern of all this attention (framed also within the context of hostility to apartheid in neighbouring South Africa) has been the poverty of Basotho. Focusing on poverty has helped outsiders to a better appreciation of how they can support Basotho in alleviating some of the hardships that have so constrained (mostly institutional constraints) horticulture producers (Turner, 2001. pg.3). Despite having been forced into a small space and a harsh environment by colonisation and apartheid, the Basotho have survived.

Although twice as many of them occupy this small space than at independence from Britain in 1966, their standards of living has risen over the decades. However,, the productivity of their agriculture has been dwindling, so many are finding new ways to sustain themselves. An ingenious farmer in the South West converts dongas into fields and sells his produce to South Africa across the border. There is no state pension in Lesotho. One has to engage in horticulture and agriculture to survive and see the next day (Turner, 2001. pg. 3). In 1997, the ASIP (Agricultural Sector Investment Programme) was introduced.

The planning process for this initiative was started around 1995, coming to fruition in 1998. The overall strategy of the ASIP was to commercialise agriculture and also horticulture into a competitive sector, responsive to market signals. Related sub-strategies of the ASIP included; the diversification of agricultural base, embracing a switch into higher value of horticultural crops, intensive livestock production and promotion of rural non-farm activities (Ministry of Agriculture, 1994). Sales of livestock, wool, mohair, milk and meat make important contributions to the household economy, and a large number of animals are viewed as a desirable means of accruing savings. Livestock production is therefore a more stable source of income.

There are no formal horticulture produce markets in Lesotho either in the rural or urban areas. Marketing of small-scale processed products is largely informal. Enterprises located in the rural areas of Lesotho rely on demand from local informal markets, which are small and unreliable. Demand is erratic and seasonal (only when fresh products are not available). There is also a general lack of marketing skills and information in the country. Processors have little knowledge of their customer preferences regarding a product range; taste and packaging for example. There is no evidence of a deliberate effort to promote the products. Alack of transport and poor infrastructure (roads) are often cited as hindrances to going out to market the business (Shezi, 2005).

3.3 The model

In an assessment of the viability of a production and marketing system, farm output or farm revenue would be the most important and intuitively appealing response variable whose variations the analysis would attempt to explain by means of a set of explanatory variables. In this study, the effort to secure production data was frustrated by the farmers' poor recall of production information in previous years and the difficulty experienced in applying local measures of agricultural production. As a result, farm revenue could not be confidently estimated.

But farmers do not have any difficulties expressing an opinion one way or the other about whether they are satisfied with the level of production they are capable of achieving. Fortunately, this question had been included in the questionnaire and farmers' responses seemed consistent with impression created about their relative status by the inconclusive production data. The study therefore decided to fit a model that accommodated "production satisfaction" as a binary choice variable such that when a farmer reports satisfaction with the previous year's production it is scored as one (1) or zero (0).

Specifying such a model is no different from the approach taken by D'Haese et al. (2003) in analyzing how participation decisions are influenced by set of institutional factors in the former Transkei region. Of the large number of variables obtained through the sample survey, the institutional factors can be identified as: standard and grading, land access, transport availability, possession or otherwise of title deeds to land cultivated, extension services, and availability of markets.

The hypothesis to be tested is that the probability that farmers will be satisfied with the outcome of their production activities will depend on several elements in the environment, of the farmer, especially the institutional factors. For instance, where the farmer has access to land and other production resources, extension services, title deeds, etc., the chances are that the farmer is likely to perform at levels that he/she finds satisfactory. But this attribute is unobservable. There is no objective measure of satisfaction with the level of production except as revealed by the respondent; even when the level of production appears substantial or reasonable, the

farmer may still not be satisfied depending on his/her personal and other characteristics. But this is consistent with human nature and a normal distribution can be assumed in this case. According to Greene (2000), it is this attribute that makes the problem one that is amenable by any of the qualitative choice models such as probit, logit or tobit models. For purposes of this study, the probit model is chosen because it was necessary to avoid selection bias in the sample (Yunez-Naude and Taylor, 2001).

A probit model is an econometric model in which the dependent variable Y_i can be only 1 or 0, and the independent variables x_i s are estimated as:

$$\Pr (Y_i=1) = F(x_i' \beta)$$

Here β is a parameter to be estimated, and F is the normal Cumulative Distribution Function (CDF). The logit model is the same but with a different CDF for F while the Probit model or the Normit model is an estimating model which emerges from a normal CDF.

To proceed, the model of production satisfaction can be stated in general terms as follows:

$$Y = PS = f(X_1, X_2 \dots X_n) \dots\dots\dots (1)$$

Where:

Y is the dependent variable that captures what the small producers think about the results they are achieving in their horticultural production, and the X 's in the model represent the set of institutional factors already mentioned above. Such a model can be specified as follows:

$$Y^*_i = \beta_1 + \beta_2 X_{2i} \dots\dots\dots \beta_k X_k + \mu_i \dots\dots\dots (2)$$

But the handicap is that Y^* cannot be observed in reality but can only be inferred. This means also that its exact determinants can only be estimated on the basis of the dummy variables constructed for this purpose which can be defined as:

$$Y=0 \text{ if } y < 0 \dots\dots\dots (3)$$

$$Y=1 \text{ if } y \geq 0 \dots\dots\dots (4)$$

From the foregoing equations, it can be deduced that:

$$\text{Prob } (y=1) = \text{Prob } (\mu_i > -\beta' x_i) = 1 - F(-\beta' x_i) \dots\dots\dots (5)$$

This assumes that F is the cumulative distribution function for the error term μ . Under the assumption that the error term, μ , is normally and independently distributed, i.e. (IN (0, σ^2), we can define a probit model as:

$$F(-\beta' X_i) = 1 / (2\pi)^{1/2} \exp(-t^2/2) dt \dots\dots\dots (6)$$

The econometric software Stata 10 is able to calculate the probit coefficients and estimate maximum likelihood ratios based on which model validity can be ascertained. Marginal effects of the independent variables were also calculated and interpreted.

3.4 Data

This section presents and describes the variables collected during the survey. Table 3.1 lists these variables and provides details on how each variable has been measured and its hypothesized relationship with the measure of farm performance adopted in this study.

Table 3.1 The variables used for analysis in the study

Dependent variable	Variable description	Anticipated sign +/-
1. Production satisfaction	Dummy: 1. Satisfied=1, 0 Otherwise	
Independent variables	Variable description	
Gender	Dummy: Male =1, 0 Female	+/-
Age	Continuous	+
Years of education experience	Continuous	+
Market information	Dummy: Have access = 1, 0 otherwise	+
Access to production skills	Dummy: Have access = 1, 0 otherwise	+
Visits by extension personnel	Categorical: Yes = 1, 0 No	+
Extension quality service	Dummy: Good = 1, 0 otherwise	-
Grading to market standards	Dummy: Meet standards = 1, 0 otherwise	+
Access to title deeds	Dummy: Have access =1, 0 otherwise	+/-
Member association	Dummy: Yes = 1, 0 Otherwise	+/-
Transport	Dummy: Yes=1, 0 Otherwise	+
Storage	Dummy: Yes=1, 0 Otherwise	+
Contractual markets	Dummy: Yes=1, 0 Otherwise	+
Road infrastructure	Dummy: Yes=1, 2 Otherwise	+

The signs of the coefficients show the direction of influence of the variables on the dependent variable. It follows that a positive value indicates an increase in the likelihood that there will be a change to the alternative option from the baseline to the alternative (Gujarati, 1992). Hence, in this study, a positive value implies an increase in the probability of increasing the production and marketing of horticultural products.

- **Gender (GNDR):** Gender is clearly an important factor in horticulture production and marketing especially in a country such as Lesotho where

gender-based stereotyping is the norm. Decision making roles are normally divided between men and women depending on the nature of the economic and social activity involved. In general, the legal system regards women as minors who do not have the power to make important decisions in the household in relation to resource allocation. But the situation becomes complicated when a woman is either widowed or has a non-resident spouse who is probably employed in South Africa in a variety of income generating activities not readily available in Lesotho. In such cases, women may partake in decision making when it comes to growing of crops, but under clear delegation.

- **Production satisfaction (PRDNSATISF):** This dependent variable measures whether a farmer is satisfied with his production or not. The variable is for production rates, participation level but with emphasis on the production satisfaction of the farmer, and this variable explains the production information of the farmers which is notoriously unreliable at times, as farmers tend to inflate it for prestige purposes or deflate it to evade taxation. But when they are not required to state how much they have produced in a season, they are more likely to be honest about whether or not they are satisfied.
- **Age (AGE):** This variable is the actual age of the household head measured in years. According to Bembridge (1984), age determines the behavioral patterns of a household. Young farmers are expected to be more energetic in doing arduous farm tasks than older farmers whom are likely to avoid the more arduous operations and settle for those that are physically less demanding. Age is also associated with experience and the length of time over which an individual has been accumulating capital for investment in farm operations. Younger farmers are expected to be less technically experienced as well as have less capital at their disposal.
- **Contractual market (CONTRCTMKT):** This dependent variable measures whether or not the farmer has access to a market contract or not. The relationship between market contract in horticulture production and

especially marketing is an important one and at the same time hard to attain because, for a farmer to have access to a market contract, there are certain qualifications he or she must have. For instance taking part in the formal market or having access to capital or credit. On the other hand, contracts ensure the availability of a guaranteed market for the farmers, thus promoting market participation in horticulture production because it is through contracts that farmers are assured of readily available inputs, ready and accessible market, support and credit and loans to buy inputs at lower prices.

- **Years of education (YRSEDU):** Bembridge (1984) confirmed the importance of education in the decision-making process with implications for capital production and adoption of innovative practices in production and marketing. . In agriculture production, education plays a significant role in the extent to which farmers process information about new inputs and methods and the adoption of improved agricultural techniques. The absence of education is therefore expected to have a negative impact on the production and marketing of horticultural produce. It is therefore hypothesized that there is a positive correlation between education and horticulture production and marketing.
- **Market information (MKTINFOR):** Information in farming business is an important determinant of communication. The variable, access to market information was measured by the farmers' ability to access market information and their ability to interpret it. To capture this variable, farmers were interviewed on communication networks that are accessible to them such as radio, TV etc. The communication could either be on the availability of markets or inputs being sold at a lower price for the farmers. Access to information has been set as a dummy variable, where a household with access to information takes the value of one and a household that has no access to information takes a value of zero. Access to information was expected to positively influence production and market participation; implying that households with access to information would be more likely to participate in both.

- **Production skills (SKILLS):** This variable measures different skills of production a farmer has acquired during years of farming. These include farm management, record keeping, financial management, marketing etc. It can be hypothesized that the less a farmer lacks production skills, the higher the possibility of poor production and less market access. Thus, there is a positive relationship between production skills, marketing and production. A production skill is given categorical values to define it.

- **Extension visits (EXTNVISITS):** Contact between the extension officers and the farmer is important, and this variable, which is on its own, is an important source of information for farmers (Enki, 2001). Denoted by one if farmers are being visited and zero if otherwise, extension visits have a positive effect on farming.

- **Quality of service extension (QUALITYSERV):** Access to extension services is an important variable in the farming sector because through this service, farmers gain access to farming advice and farming knowledge. New ways and techniques of farming are also provided by the extension service. Farmers were asked to rank it from excellent, very good, satisfactory, poor and very poor. The better the service provided by the extension, the better the quality of farming business there will be. In this study, it is hypothesized that the quality of extension service provided to the farmers is poor. This variable is analyzed as categorical.

- **Grading to market standard (STDGRADING):** In this study, there are grading standards which small-farmers have difficulty meeting and are therefore excluded from profitable markets. According to Kherallah and Kirsten (2002), there are regulations imposed by markets to meet consumer demand and create market niches. These regulations are trickling down to the production level thereby affecting the structure and characteristics of the market downstream.

- **Title deeds (TITLEDEEDS):** This variable represents serious constraints especially when it comes to land. Farmers without title deeds to land but are in the farming business, are highly constrained as the land could be re-possessed from them at any time. This variable is therefore hypothesized as either negative or positive for those farmers who have acquired title deeds.
- **Member of association (ASSMEM):** This variable was deemed important because in Lesotho there is a well developed system of traditional cooperating which small farmers draw upon to address labour bottle necks and other production constraints. The *Letsema* has been in operation for centuries and entails farmers working in groups to address a problem by collective action. It was also observed that some farmers join the Districts Farmer Association (DFA) which serves other objectives including extension. Through this association small farmers are able to access inputs and credit. The work of Ostrom and others shows that customs and social conventions designed to induce cooperative solutions can overcome the collective action difficulties and help achieve efficiency in resource use (Nabli & Nugent, 1989).
- **Transport (TRANS):** Transport ownership was hypothesized to be a huge constraint because many farmers did not have their own means of transporting the produce to the markets. According to the interview findings, many farmers used public transportation while others used hired transport which was confirmed to be costly and unreliable as owners of the cars were sometimes not available. In addition, availability of transportation helps reduce long market distance constraint.
- **Storage (STOR):** Storage is closely related to the characteristic nature that agricultural products have, namely perishability. Good storage facilities reduce loss of produce and maintain the physical state of produce hence adding Value.
- **Road infrastructure (RDINFR):** Road infrastructure is measured by the accessibility and the condition of road networks that are available to farmers

to enable them travel to the nearby or furthest markets. The poorer the road condition, the harder it is for farmers to travel and transport their products and according to the findings of this study, road infrastructure is one constraint that is hindering the marketing process.

3.5 Sampling procedure

Selection of respondents was based on being a participant in horticulture farming and farmer's willingness to participate in the research. As complete lists of farmers in the study area were available at respective departments of agriculture at district level, a simple random sampling of farmers was done. During the data collection process, the participants were informed of the objective as well as the confidentiality of the study. Interviews were done at farmers' homesteads and in the fields. Farmers were interviewed individually. Respondents were usually household heads; however, in the absence of household heads, any member of the household was interviewed.

3.6 Data collection methods

Secondary data on horticulture farming in Lesotho was collected through interviewing extension officers and qualified personnel in the Ministry of Agriculture who work with horticulture farmers in Lesotho on a daily basis. In addition to these secondary sources of data, other information pertaining to horticultural farming in Lesotho was obtained from books, journals and the internet. Direct observations were used to assess the condition of crops, size of fields, pests and diseases that were affecting crop production. Following the secondary data collection, pre-tested structured questionnaires were administered to the randomly selected household heads.

However, face-to-face interviews were chosen because they have several advantages over the other methods. According to Bless and Smith (2000), an interviewer-administered interview is important because it reduces the omission of questions by respondents. Twenty five (25) questionnaires were administered in each district making the total number of distributed questionnaires one hundred. The questionnaire was designed as a tool for primary data collection and was balanced

with both open-ended and closed questions. Open-ended questions gave the respondents greater freedom of expression as they offered respondents an opportunity to qualify their answers thus reducing bias due to unlimited response ranges. A personally administered questionnaire was used mainly because the interviewer could ensure that all questions were answered and that there is high reliability of the data that could be obtained because the interviewer could probe with further questions if the respondents appeared to have misunderstood the question or appeared to be giving false information. Because of time constraints and the fear of researcher/interviewee bias that could arise from open ended questions, the questionnaire was balanced with closed ended questions that were quick to answer. The questionnaire collected a range of information

The questionnaire captured a range of information, chief of which included demographic characteristics such as (gender, age, marital status, household size, highest educational level attained, and non-farm employment), resource ownership such as (land and property rights over that land), production aspects like (type of farming, and problems relating to production) financial support and the constraints, transport availability, market proximity, market institutional arrangements (grades and standard arrangements) and extension support.

3.7 Chapter summary

The discussion presented in this chapter, concludes that farming in Lesotho is mostly practiced in the rural areas where people are faced with many constraints including poor infrastructure, poor communication, access to extension services and lack of markets for their produce. Also, in this chapter, the methods that were used to analyse the data were reviewed. Data were collected from 100 farmers in the four districts namely Butha-Buthe, Teyateyaneng, Mafeteng and Thaba-tseka. To collect the data, a questionnaire was administered to the respondents through face-to-face interviews. For data analysis, a probit model was used and the results of the study follow in the next chapter.

CHAPTER 4

PRESENTATION OF RESULTS

4.1 Introduction

The chapter begins with a description of the demographic and socio-economic characteristics of the sampled households. Following this, aspects related to agricultural production and marketing and factors influencing them, are highlighted as revealed by the results of the analysis. The main objective of this chapter is to present the empirical results in accordance with the research objectives which are to identify the institutional factors affecting the production and marketing of horticultures in Lesotho. The aim is to identify those constraints that hinder the development of these vital activities to their full potential. In the light of the foregoing aim, the results of the inferential analysis involving the probit modeling, is presented to establish the relationship between the chosen dependent variable of production satisfaction and the institutional explanatory variables included in the model.

4.2 Demographic background of the survey households

In this section, household heads' demographic and socioeconomic characteristics such as gender, age, marital status, household size and highest educational levels, are discussed. These aspects are important because the main household activities are coordinated by the household head and the head's decisions are most likely to be influenced by such demographic and socio-economic aspects (Makhura, 2001). According to Randela (2005), demographic characteristics of households are essential when analysing economic data because such factors influence the households' economic behaviour. Table 4.1 below presents a summary of the descriptive statistics that profile the households' demographic and socioeconomic background while the discussions related to them are presented in the sub-sections that follow below.

Table 4.1: Demographic and socio-economic background of sample households in Lesotho.

Variables	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Kurtosis	
					Statistic	Std. Error
GENDER			1.39	.490	-1.827	.478
HOUSEHOLD SIZE	2	14	8.02	2.365	-.094	.478
MARITAL STATUS			2.23	.851	.653	.478
YEARS OF EDUCATION	1	15	5.74	2.561	2.394	.478

Source: Field study 2009

4.2.1 Gender of household head

During the survey it was found that there are more men working in the fields than there are women. The results shown in Table 4.1 above reflect the mean percentage of gender of the respondents. As the gender dummy is scaled with 1 standing for male household heads while 2 stands for female household heads, a mean greater than 1 suggests a bias towards more female household heads. The in Table 4.1 indicates that the gender variable had a mean of about 1.4 which implies that there are more female household heads in the sample than otherwise. Gender division plays an important role in traditional agriculture because there are important gender based differences in the way men and women decide about such crucial issues as land size, inputs to use, what and when to market etc.

Generally, men are physically capable of coping with the more arduous farming practices. On the other hand, women, even if they are better educated, often need men's help to carry out certain activities (Sokhela, 1990). The results in table 4.1 do not however agree with the popular notion concerning the gender distribution in the normal agricultural sector of Lesotho. According to the dominant views, the Lesotho men have largely migrated to the mines, leaving women in charge. Of course many changes may have occurred in recent years with the massive retrenchments that have taken place in the mines, leading to the return migration of the ex-miners many of whom found employment in rural farming. But it would seem from the results that

the return migration has not reached a level to tip the balance against women in the gender distribution of the population.

4.2.2 Age of household head

Age in farming determines how experienced a farmer is, and the older people in many instances happen to be the ones with more farming experience and interest than does the younger generation. But younger farmers may be more progressive in terms of adoption of new methods of farming and could also be more aggressive in exploring new opportunities for the marketing of their produce. Bembridge (1986) agrees that age may be a contributing factor influencing success in farming, because younger farmers are more adaptable and willing than the old to try new methods. The results are shown in Table 4.2 below.

Table 4.2: Age groups of sample households in Lesotho.

Age Groups	Number of people	Valid percent
38-51	17	17.0
52-63	44	17.0
64-82	39	17.0
Total	100	100

Source: Field Study 2009

The results of the ages of farmers show a distribution in which 17 people were aged between 38 to 51, 44 people aged between 52 to 63 while 39 were aged between 64 to 82 (Refer to Table 4.2 above). This shows that many older people are actually partaking in the farming business whilst young people are not much interested in agricultural production. Also there is a fair balance in the age distribution among the districts.

The interviews during data collection revealed that many young people instead of being involved in the farming business, prefer going to school to find better paying jobs while a few of them just prefer staying at home or working piece jobs in the Chinese factories to earn quick money. But on the other hand, with regard to information access, younger people have more access to information than the old because of their ability to read, and through travelling. The main challenge is that a

lot of horticulture activities are in the hands of old farmers, with a few young farmers getting actively involved lately.

4.2.3 Household size

Household size is without a doubt a very important variable in communal agriculture where labour-intensive methods are employed in the production process. There is strong evidence that it has an influence on marketing since it affects consumption and production (Randela, 2005). A larger household size discourages selling because the household needs to satisfy household consumption before it decides to sell. It becomes even more difficult to produce and sell where the household comprises either very old or very young members (dependents) who cannot assist with farming. So household size works both at the production and consumption ends of the value chain. The range, mean, standard deviation and skewedness of household size for the survey households are shown in Table 4.1 above. According to the results, household size ranged from a minimum of 2 persons to a maximum of 14 persons with a mean of 8.06 persons per family. The indication from looking at the standard deviation is that the households vary to some extent in relation to this variable with the bulk of the households tending to have smaller rather than larger sizes. These results agree with recent trends in respect of household size which seems to be falling quite sharply as a result of the negative impact of HIV/AIDS and the fact that household members are migrating to South Africa much more than previously.

4.2.4 Marital status

Stable married couples are in a position of being committed to their farming business than single or divorced persons. This is probably as a result of the heavier load for family support that married persons have to shoulder. As does age, marriage plays an exclusively important role in agricultural production because, for many people who are married, agriculture is their life and a source of their family income. Marital status is also said to influence the stability of the farming business if both the man and woman are engaged in the business. Of course, it does not necessarily follow that single persons are less burdened by family responsibilities

since many single-parent households exist in the study area. But this information still provides some insight into the demographic characteristics and a possible explanation for observed trends and tendencies. The results are shown in Table 4.1 above.

4.2.5 Educational level of household head

All surveyed household heads had had some education and the raw data shows that years of schooling ranged from 1-15 years in Table 4.1 above. The education status determines the way of thinking and the behaviour of an individual, and consequently his/her readiness to accept innovations and new technologies by development agents. Education levels affect market information interpretation and market participation level of farmers. Moreover, education is said to be evidence enough that education and economic growth are closely linked and to an extent, it provides a sense of motivation and also establishes a sense of achievement orientation.

The educational status of villagers/farmers and, for that matter heads of the households, is important for community development both agriculturally and non-agriculturally in developing countries. Strong claims have therefore been made for education as one of the crucial variables in achieving economic growth, agricultural development and human progress (Panin, 1999). According to Panin (1999), education pushes back cultural prohibitions, widens the scope for decision-making because it broadens a persons' idea of the "possible", adds new taste and stimulates motivation. He also concludes that it increases the farmers' inquisitiveness which heightens the discovery of new knowledge concerning the operation of the farm and its unique resources.

4.3 Agricultural Production and Marketing Environment of the survey households

The agricultural production and marketing environment under which households operate was examined. It is important to recognize these factors in order to understand the market participation behaviour of smallholder farmers. Hence this

section looks at factors related to labour, extension services, market information accessibility, and farmer training.

4.3.1 Labour use in the farming system

This section looks at labour which is an important factor of production among smallholder farmers. This is because the traditional farming system operated by the survey households is essentially labour-intensive rather than capital intensive (Kirsten and van Zyl, 1998). It was merely intended to ascertain whether or not the farmers used labour in the farming system. The respondents were asked whether or not they engaged hired labour for their farm operations during the previous farming season. The results of the assessment of the households in respect to labour use are presented in Table 4.3 below.

Table 4.3 Labour use in the farming system of households in Lesotho.

	Frequency	Percent (%)
No labour	49	49.0
Labour	51	51.0
Total	100	100

Source: Field study 2009

From the results, it was shown that the sample was split more or less equally between those who used hired labour and those who did not with about 49% indicating that they lacked labour while the rest had labour working in their fields. The bulk of the available labour is family labour which households use as a means of avoiding higher costs. The use of more laborers is closely related to larger land sizes and advanced commercial production, two things for which Lesotho is hardly well-known.

4.3.2 Extension Services

From the results obtained during the survey, the minimum number of visits by the extension agents to the farmers was 2 and the maximum 3 (see Table 4.4 below). Also farmers claimed they received their extension visits only once a month except on occasions when the extension agents were called to deal with an emergency.

Such visits constitute special visits made to the emerging farmers who need more frequent attention until their businesses are strong enough to proceed without a lot of attention from the extension services. Extension services are considered the most crucial sources of information among small farmers (Dorward *et al*, 2003). At one level, they provide opportunities to disseminate to farmers vital information about agricultural practices that will promote their livelihoods. At another level, they serve as opportunities for government to learn more about rural conditions because in their absence the problems of farmers (especially those farmers in the rural areas) stay hidden from the government. In such situations farming constraints stay unresolved for a long time.

Table 4.4: Statistics of Extension Visits to Survey Farming Households in Lesotho in 2008

Variables	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Kurtosis	
					Statistic	Std. Error
Extension Services	2	3	2.92	.273	8.043	.478

Source: Field study 2009

4.3.3 Market information access

Availability of market information allows farmers to make informed decisions. Farmers who are more and well informed are more likely to participate in marketing. Of importance is the source of market information because it determines the accuracy of the information. Moreover, the farmers who do not receive information in time are as good as those who do not have access at all because the information may be useless by the time they receive it. Results are shown in Table 4.5 below.

Table 4.5 Market information access of households in Lesotho.

	Frequency	Percent (%)
Access infor	48	48.0
No infor access	52	52.0
Total	100	100

Source: Field study 2009

From the results of the interviews (Table 4.5 above), 52 % of the respondents did not have access to market information and 48% of the respondents had access. Some respondents who had access said they use the radio as their source of information while others use the newspapers. A third group of respondents got their information from the extension agents while others got information from the television, friends etc (Figure below).

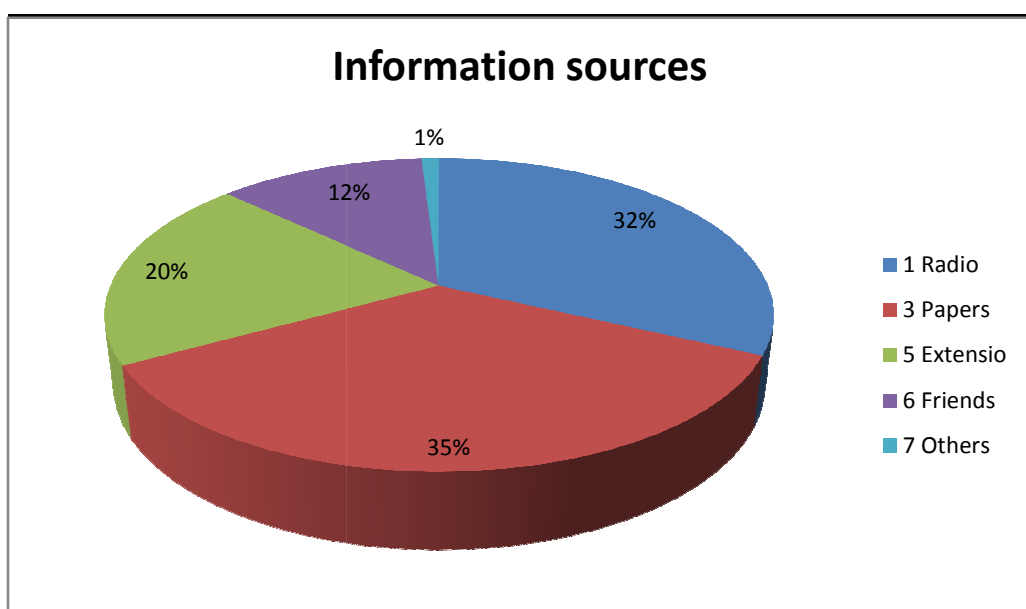


Figure 4.1 Market information sources of households in Lesotho.
Source: Field study 2009

Information is vital to market participation of smallholder farmers. Farmers who do not receive information in time are as handicapped as those who do not have access at all as the information may be useless by the time they receive it. Searching for market information is not without cost and that may explain why there is a divergence of prices between efficient markets and why capital markets are “imperfect” (Montshwe, 2006).

4.3.4 Farmer training

Farmer training refers to the informal capacitating of farmers by means of extension visits, workshop participation, and other such arrangements. Farmer training can be used to educate farmers on various farming practices. They can be practical techniques for educating the older farmers on the improved methods of production. Results of farmer training are shown in the Table below.

Table 4.6: Farmer training of households in Lesotho.

	Frequency	Percent (%)
No training	86	88.7
Training	11	11.3
Total	97	100.0
Missing	3	
Total	100	100

Source: Field study 2009

In the four districts of Lesotho, farmers did attend workshops but a few respondents did not because they claimed that many of the workshops are conducted in English, which is a problem for farmers who have an imperfect knowledge of English. But for those who attended, research shows that they found everything taught useful and beneficial (the results are shown in Table 4.6).

4.2.5 Land holding in the farming system

Land available to horticulture producers in Lesotho is usually shared between residential and farming/production purposes. This situation leaves less arable land for farming purposes. In addition, most farmers do not own the land they farm on, even though they have rights to use it (Ngqangweni and Delgado, 2003). Most importantly, ownership of land can influence agricultural productivity, in the sense that farmers who do not own land can be reluctant to develop and maintain the land (Randela, Liebenberg, Kirsten and Townsend, 2000). Furthermore, such farmers may experience difficulties in obtaining loans for agricultural purposes because they cannot use the land as collateral, since they do not have title deeds to them. Results are shown in Table 4.7 below.

Table 4.7: Land holding in the farming system of the households in Lesotho.

Land sizes/Ha	Number of people	Percent (%)
1.0-2.0	27	27.0
2.5-3.5	39	39.0
4.0-5.0	28	28.0
5.5-6.0	6	6.0
Total	100	100

Source: Field study 2009

The majority of the survey households have limited land and few persons actually had title deeds to the land they owned. Only about a few respondents of the surveyed households expressed satisfaction with the results they obtain from their farming activities in respect of land use. Importantly, there was evidence that the households experienced serious problems with access to land. The results (Table 4.7 above), show that many farmers practice their horticulture production on land ranging between five to six hectares while some farmers own land of less than two or less hectares.

4.4 Production constraints

Many of the agricultural horticulture crops have one common character and that is their high degree of perishability. Because of institutional constraints such as a lack of markets and poor infrastructure in Lesotho, the products tend to spoil rapidly if they are kept without proper storage arrangements. Also, poor roads often contribute to spoilage in tomatoes because they bump against each other during transport. For this reason, it is difficult for producers in the mountain areas where there is an infrastructure problem to have access to buying inputs, and on top of that, land for production is scarce and farmers do not have full access to it. Moreover, capital is not available to start production or perhaps sustain it for those who are already in the business. Table 4.8 below presents a summary of the descriptive statistics that profile the production constraints of the survey households.

4.4.1 Capital availability

Availability of capital in the farming business is expected to influence production in agriculture together with marketing. In other words, ownership and availability of capital can lead to a timely planting because of the availability of production inputs, labour and availability of equipment bought with the capital. Of equal importance is the availability of capital to purchase the new technology that will be used for production and marketing of the produce in order to sustain the farming business. Table 4.8 shows the results from the survey.

Table 4.8: Capital availability of households in Lesotho.

	Frequency	Valid Percent (%)
Capital access	44	44.0
No capital access	56	56.0
Total	100	100.0

Source: Field study 2009

Capital is one important pre-requisite to start and sustain a farming business. Capital buys inputs and pays labour working in the fields. During the interview discussions, farmers raised the issue of the lack of capital and the problems that this causes. The results are shown in Table 4.8 above.

4.4.2 Land acquisition

The context of land acquisition plays an important role in the livelihoods of Basotho. For one thing, land in many developing countries is usually shared between residential and farming purposes, leaving less arable land for farming purposes. So, overall from the interviews, the respondents claimed they have no complete access to land. More land seems to be provided in the urban areas where people are not interested in agriculture. In addition, farmers do not have sufficient capital to rent or lease land. Also, the requirements for a farmer to have full access to land are impossible to meet especially for small-scale farmers. Hence, farmers are engaged in share cropping; where two or more producers would agree to produce on one piece of land together, sell and then divide the profits equally.

One other factor that was mentioned during the interviews was the problem of land utilisation and allocation of enterprises between farmers in a share cropping programme. While one farmer might want to cultivate cabbage in one season for example, the partner might desire to grow potatoes, leading to conflicts among farmers in share cropping. Many sharecroppers resort to cheating which further strains the relationship. Sometimes, the owners of land in a sharecropping partnership commit their land to programmes that do not involve their partners. The survey revealed that the majority (52%) of the respondents did not own land. This constitutes a binding constraint and a disincentive to farmers who might prefer to

move elsewhere to minimize the uncertainties of farming because they do not have what is lawfully and rightfully theirs while producers have land that is leased or rented out. Only 48 % had access to their own land while the others use land on rental/lease basis.

4.4.3 Access to production inputs

The issue of inputs (seeds and fertilizers) is also an important one. All of the farmers, according to the results, were found to be using fertilizers, either organic or inorganic. About 77% of the respondents used inorganic fertilizer while the rest used animal waste and other organic material because most households keep animals such as cattle, horses, donkeys, sheep and goats. These households use the animals' waste as manure because it is cheap and more readily available than organic fertilizers which are very expensive. For some farmers, it is even a problem to have access to the markets and the means of transport to go and buy those inputs. According to the results, 13% use organic manure because these are farmers who are live closer to the markets while 10% prefer the use of either one depending on the situation, and because they have access to both of these inputs.

4.5 Market constraints

Among marketing problems, lack of markets and accessibility to markets, are what many farmers in the rural areas of Lesotho face. Farmers complain that whenever their produce is ready, it is difficult for them to get it to the markets because there are no regular markets to deal with. A description of results from the interview on market constraints follows below.

4.5.1 Infrastructure

This variable includes aspects such as distance to markets, transport to and from the markets, market information and road conditions to the markets. According to Dorward, Poole, Morrison, Kydd and Urey (2003), farmers staying further from the markets have problems of transporting their produce to the markets because of poor infrastructure including poor road conditions and inadequate communication

services. By extension of the definition of institutional arrangements and environments, these elements constitute institutional factors. The respondents were asked to indicate the extent to which their neighbourhoods were served with the relevant infrastructure and the distances they had to travel to access the nearest markets where their produce of horticulture was sold. The results are shown in Table 4.9 below.

Table 4.9: Infrastructure availability for farming households in Lesotho.

	Frequency	Valid Percent
Access to infrastructure	47	47.0
Lack infrastructure	53	53.0
Total	100	100.0

Source: Field study 2009

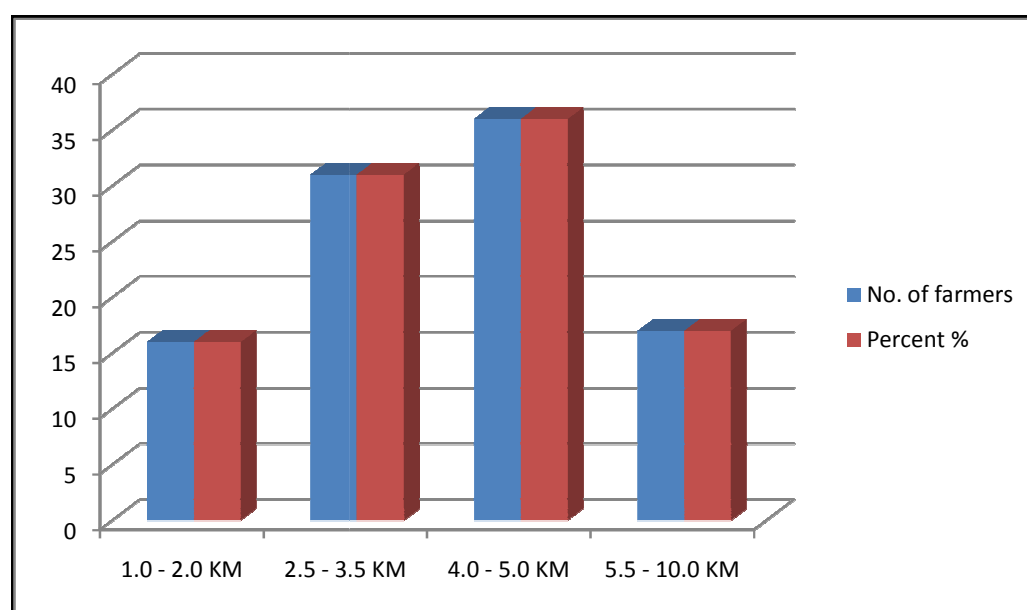


Figure 4.2 Distance travelled by the respondents to access markets.

Source: Field study 2009

The results in Figure 4.2 above, shows that the minimum, shortest distance to the market is between 1 KM to 3.5 KM, while the maximum distance was between 4.0 to 10 KM. Farmers staying further from the markets have problems of transporting their produce to the markets because of poor infrastructure including poor road conditions and inadequate communication services. For those staying closer to markets, information is more accessible, market feasibility is not a problem and

quick assistance from the extension agents is often guaranteed. Furthermore, the availability and conditions of the road to the nearest towns determine accessibility of markets and in contrast, the lack of road connectivity leads to delays in transferring produce to market areas, which can lead to quantitative and qualitative losses in farm produce. Such conditions can result in farm-gate produce sales which often fetch lower than the growing market prices. From the results, it was found that many small-scale horticulture producers live far from the markets. As a result, they sell their produce locally at lower prices that do not yield profit. Only a small percentage sells to hawkers in town and to fruit and vegetable shops. Moreover, farmers located closer to towns are more likely to market their produce better than those located far away. This is because such farmers are more familiar with the markets and they face lower transportation costs (Dorward, Poole, Morrison, Kydd and Urey, 2003).

4.5.2 Transport availability

The issue of transport for the farmers is also significant and closely related to the infrastructure issue mentioned above. In the study, it was found that 47% of farmers use hired transport to take their produce to the markets. These farmers do not have access to income or production loans and therefore they need to hire transport to take their produce to the markets yet ironically, these are the farmers who cannot afford it. Only 22% have their own transport. These are mainly former mine workers who have returned from South Africa and invested in farming. The results show that 27% make use of public transportation and the remaining 4% use wheelbarrows because they live close to the markets.

4.5.3 Storage infrastructure

The results reveal that 59% of farmers do not have access to storage. Of the 41% who do have access, some only have partial ownership while others hire the facility. Storage is a necessity in the farming business, especially in the production of horticulture crops whose main characteristic is perishability. These products need storage with enough ventilation and correct temperatures, but according to the findings of this study, farmers in Lesotho do not have proper storage facilities.

Farmers tend to associate with institutions such as cooperatives to take their goods for sale, processing and storage (Makhura, 2001).

4.5.4 Marketing

A market can be defined as an area in which exchange takes place between producers/sellers and consumers. In this study, many farmers take their produce to towns on days when there are many buyers and the results are shown in the Table 4.10 below.

Table 4.10: Market availability of households in Lesotho.

	Frequency	Valid Percent (%)
Informal	95	95.0
Formal	5	5.0
Total	100	100.0

Source: Field study 2009

According to the results in the Table above, 54% of the farmers indicated that they had problems pertaining to marketing and markets at large. The main issue was the lack of transport to take the produce to the markets. The respondents also indicated that high transport costs posed severe constraints. There was also an indication that the choices were limited in terms of the options for rural transportation. Only 46% of the farmers did not have any serious complaints about the transportation facilities. These were people who had sufficient income to hire transport vehicles. Also, these were the farmers who had access to retail markets in urban areas like towns and cities (Barrett and Mutambatsere, 2005).

4.5.5 Contractual markets

From the interviews, it was revealed that none (100%) of the survey farmers had any contractual arrangements for marketing their produce. Studies show that farmers without contractual markets usually face the problem of not getting their produce sold while those farmers who do have access are able to sell their produce easily. The causes of the lack of contracts as highlighted by the survey farmers were that small-scale farmers lack the bargaining power to guarantee favourable terms.

However, some farmers did not like being in a contract farming arrangement because it displaces decision-making authority from them to the downstream processors. Other problems were related to high per unit costs of contracting. In addition, smallholder farmers stated that they had problems in meeting stringent quality and safety requirements and therefore agribusinesses prefers contracts with medium to large-scale farmers. Price variations were also seen as very serious and one of the other major reasons why the farmers did not have contractual markets was that they claimed that markets determine their prices even in bad production seasons when they would have incurred more losses due to bad weather, pests and other production constraints.

4.5.6 Product grading in different districts

The demand for safe, healthy, and high-quality foods is on the increase for many reasons. On one level, a number of ailments that afflict people today can only be managed through better nutrition which starts with selecting healthier and safer foods. Expert opinion also suggests that poor feeding practices are responsible in part at least, for the many problems consumers face.

There is an example of supermarkets in Europe which have strict regulations regarding pesticide residue on fruits and vegetables (formally known as Minimum Residue Levels (MRLs)) (Kherallah and Kirsten 2002). This is why grading of all food stuffs is necessary and required. Thus in the four districts, 47% of the producers graded their produce while 53% did not. Those who did not claimed that meeting grading standards was too expensive and time consuming. This therefore shows how important grading of foodstuffs really is.

4.6 Obstacles to profitable production of horticulture in Lesotho

As indicated previously, this study set out to determine the impact of institutional factors on horticulture production and marketing in Lesotho. This called for the specification of a model that allowed for an appropriate response variable to be tracked. As explained in the chapter on methodology, the probit model is used for this purpose. The attitude of the farmers to the profitability of the horticulture sector is considered a suitable response variable for a number of reasons. In the first place,

small farmers in Lesotho, as elsewhere, have always been reluctant to divulge full information about their income. But, without giving away too much, a person can state, without embarrassment, whether or not he/she is satisfied with the performance of his or/her farming business. The intention therefore was to show the probability that the farmer is satisfied with the production performance of his/her horticulture farming.

It is then possible to attempt an explanation of the observed variations between households in relation to this response and relate these to a number of institutional influences in the farming environment. The analysis imposed revenue per hectare as an offset which could still be influential despite the difficulty in directly modeling that variable in a society where there are valid concerns over its reliability when based on a farmer's recall. The results are shown in Table 4.11 below.

Table 4.11: Log-likelihood estimates and goodness-of-fit measures for the identified market and institutional factors.

Variable	Coefficient	Standard error	z-value	p-value
Standard/grading	-0.118	0.315	-0.38	0.707
Land access	0.822	0.295	2.79	0.005
Transport facilities	3.401	0.407	8.36	0.000
Title deeds	4.840	0.304	15.93	0.000
Market distance	0.175	0.087	2.01	0.045
Transport problems	-1.182	0.323	-3.66	0.000
Extension visit	3.102	0.509	6.09	0.000

Number of obs: n=100; Wald chi² (7) = 514.42; Log likelihood = -1,119.7855; Prob chi² = 0.0000.

Table 4.12: Marginal effects of the institutional factors implicated in horticulture production in Lesotho.

Variables	Discrete change (dy/dx)	Standard error	z-value	P-value	x
Standard/grading	-0.012	0.032	-0.38	0.704	0.43
Land access	0.091	0.043	2.10	0.036	0.48
Transport facilities	0.836	0.086	9.74	0.000	0.22
Title deeds	0.905	0.040	22.40	0.000	0.39
Market distance	0.018	0.012	1.71	0.088	3.935
Transport problems	-0.131	0.050	-2.63	0.009	0.49
Extension visits	0.854	0.097	8.84	0.000	0.09

Marginal effects after probit: $y = \text{Pr} (\text{Production satisfaction}) (\text{predict}) = 0.05027315$.

According to the results, the probit model was highly significant and suggested a very good fit, with a Wald X^2 of 514.42 and log likelihood of -1,119.79 ($p=0.000$). This would mean that the modeled variables, with the exception of standard/grading, had strong enough influence to determine whether or not farmers would be satisfied with the outcomes of their farming enterprises. The marginal effects suggest that there was probably 9% higher probability of a farmer being satisfied with horticulture production if s/he had land access than if access was non-existent. In general, it would seem that possession of title deeds, access to transport facilities, and extension visits had the highest probability of impacting the attitude of the farmer than when these factors were absent. The results with respect to title deeds (as a proxy for property rights), transportation, and extension visits deserve detailed discussion. As is well known, in Lesotho, traditional tenure systems are the norm and the land is held by the monarch or traditional power élite in trust for the

population. At the same time, land is scarce and most Basotho lack access to land for farming. Of the 30,355 square kilometers of land area, only 9% is suitable for arable agriculture (Kingdom of Lesotho, 2006), and as much as 55% of the population does not have access to land for production purposes (Kingdom of Lesotho, 2006). According to Qhobela (2001), the scope for acquiring land to start agricultural production is quite limited in the face of customs that frown on the alienation of land outside the community. For this reason, land holdings are low, with the average farm size at about 2 hectares (Field study, 2009).

While it is difficult to find clear evidence of tenure insecurity, the need for reform in the land ownership arrangements cannot be overemphasized (Pule and Thabane, 2004). The results of this analysis do therefore suggest that these tenure arrangements are probably the most serious constraints faced by farmers and about which they expressed the most concern. This would indicate that there was as much as 90% chance of dissatisfaction with the production results if land tenure arrangements do not change to a more liberal system that allows for farmers to increase their landholding and expand their production of horticulture.

The situation with respect to transportation is also discussed in view of the poor state of the rural infrastructure in the country. The state of the infrastructure is not unrelated to the nature of the terrain and topography of the country. Lesotho is a mountainous country with its lowest point being on average more than 1000 metres above sea level. The rural areas and farming areas are in the foothills and mountains where access difficulties are often extreme.

Travel within the country can be rather stressful and dangerous because of the high elevations and the few safe roads (McNeil, 1996). One of the most charismatic monarchs of the Kingdom died in a ghastly road traffic accident in the country on the 15 January 1996 (McNeil, 1996) and several high government officials (including at least one government minister) have also met the same fate within the last decade. The few paved roads are narrow and often poorly constructed and pose a serious danger to road users. It is therefore understandable that this study would reveal the strong influence of transportation on the way farmers felt about the profitability of their farming activities.

The extension service of Lesotho is typical of the extension service in much of sub-Saharan Africa where they face serious constraints of staffing and facilities as well as philosophical orientation. There are frequent criticisms of the agricultural extension service in Lesotho for its failure to drive the necessary change in the farming populace, especially the rural and the resource poor (Mokone and Steyn, 2005). Expert opinion attributes the problem to the lack of requisite skills for dealing with small farmer problems and the absence of the infrastructure for managing the extension service, especially through training, providing the right type of incentives to motivate staff, among other problems. As a result, farmers are not receiving the guidance they need to apply new production methods, adopt improved inputs and practices, and identify profitable enterprise opportunities, especially in the horticulture sub-sector.

4.7 Chapter summary

This chapter presents the results of the study, showing the distribution of gender in Lesotho, where males highly outnumber females. It has been shown that there are more men working in the fields than there are women. The section on household size on the other hand points out those families are large, which in turn influences their selling behaviour.

Farmers in Lesotho face challenges in land ownership, infrastructure development and access to information including the extension services. Moreover, farmers' lack the knowledge on produce grades and standards and it is one area in which farmers in developing countries still need to acquire knowledge because the knowledge of grades and standards is the basis for farmers to enter into profitable marketing deals.

CHAPTER 5

CONCLUSION AND POLICY RECOMMENDATIONS

5.1 Introduction

It is argued that smallholder farmers need to increase their market participation and enter into commercial farming if they are to contribute to economic growth. However, it has been identified that these smallholder farmers are constrained by a number of institutional factors of production and marketing, making it difficult for them to commercialize. Such factors include poor infrastructure, lack of market transport, lack of market information, and insufficient know-how on grades and standards,

The main objective of this study was therefore to identify and assess the institutional factors influencing horticulture production and marketing in Lesotho. The focus of the study was on the institutional factors that prevent the smallholder farmers from having an incentive to fully participate in horticulture production and marketing. The empirical results of this study therefore agree with literature which identifies that smallholder farmers face a number of challenges in producing and marketing through formal market channels. This forces them to sell through informal markets, which offer lower prices hence less returns.

5.2 Summary

This chapter is a summary of different sections of the study which include; the introduction, literature review, methodology and results. The focus will therefore be on all the sub-sections making up the major chapters of the study. The section will commence with an introduction in which the background, problem statement and objectives will be summarized. The summary of the literature review will follow and the focus will be on institutions, covering different institutional aspects in horticulture production and marketing as well as general constraints on horticultural production and marketing. There is also, a summary of the methodology in which the study area will be highlighted including its location, and an overview of its geography and economy. Furthermore, the model and the data, how data were

collected and the analytical procedures are also included and summarized in chapter separate paragraph. The final part will be a summary of the results highlighting the demographic and socio-economic characteristics, institutional factors affecting production and marketing in Lesotho, and the results of the modeling exercise carried out as part of the study.

5.2.1 Background and problem statement

Much of Lesotho is rural, hence Basotho need all the agriculture and horticulture ideas they can get to facilitate a sustainable agricultural development which is central to the development strategies in the country. Agricultural activities, including production and sale of animals, field crops, vegetables, animal products such as wool and mohair, contribute 5.2% of the total national income and this percentage needs to be increased through new ideas and innovation. Unfortunately the involvement of farmers in horticulture production is half hearted, rarely going beyond ploughing and planting. Basotho farmers have to also adjust to the dynamics of agricultural marketing systems that include taking into consideration consumer tastes, as well as their health and preferences. Such adjustments would be difficult and impossible without overcoming the institutional constraints on marketing in Lesotho.

In developing countries like Lesotho, farmers experience constraints including markets which are not well developed and a paucity of market information as some of the many problems. The lack of formal market participation by small-scale farmers makes it difficult for them to shift into commercial farming thus, reducing their economic development and lowering their production incentives. Moreover, production of major horticulture crops reveals that output and productivity have been erratic hence much of the horticulture produce is imported from the Republic of South Africa. At the root of this, high transaction costs in the marketing of horticulture products and high production costs, negatively affect the viability of the sector, thus an investigation of the factors that affect horticulture production and marketing in Lesotho, finding out whether and to what extent production and marketing constraints affect horticultural farmers in Lesotho; form a major theme of this study.

5.2.2 Literature review

Farmers in the developing world face different challenges in the agricultural sectors but the effects of institutional constraints are strongest; especially those affecting production and marketing. Applying NIE to the smallholder farmers' situation, it is argued that such farmers face a number of institutional constraints which increase transaction costs and possibly lower their production incentives. Sometimes these costs are too high for farmers to get meaningful benefits from their farming and trading activities, thus discouraging farmers from marketing activities.

Institutions are a set of formal (laws, contracts, organizations, markets) and informal rules of conduct (sociological trends, traditions, religions) that facilitate coordination or govern relationships between groups or individuals (North, 1990). The institutional factors among smallholder farmers in less developed countries include lack of market information and contractual arrangements. Moreover, the marketing environment, where grades and standards have to be met, makes it difficult for farmers to market their produce because of the requirements from the formal markets.

The absence of appropriate transportation facilities and good communication measures as well as extension support is some of the institutional factors affecting small-holder farmers. All these institutional factors increase transaction costs and reduce these farmers' survival in the markets. Apart of these institutional factors, both production and marketing have several general constraints that farmers have problems with. Shortage of land, labour, and production inputs, recurrent drought and occurrence of pests and plant diseases and limited accessibility to improved agricultural technologies, multiplicity of actors and unfair competition between farmers, the lack of markets to absorb all the horticultural produce, and also the scarcity of market information to forecast demand in order to plan production are amongst the constraints.

5.2.3 Methodology

Lesotho is situated between latitude 28ES and 31ES, with Longitude 27EE and 30EE. It is a geographic enclave completely surrounded by the Republic of South Africa. Data were collected using questionnaires which were designed as a tool for primary data collection and were balanced with both open-ended and closed questions. Data captured included demographic characteristics resource ownership production aspects, financial support and the constraints, transport availability, market proximity, market institutional arrangements and extension support. Analysis of the demographic characteristics was done using description with the aid of tables and figures. The interaction between the effects of institutions and production and marketing was done on the basis of the probit model.

5.2.4 Results

5.2.4.1 Descriptive results

The descriptive results provided information related to demographic and socio-economic factors. The results show that the majority of the sampled households in the four different districts of Lesotho are above 50 years of age. Pertaining to the educational levels, some respondents only went to school for three years of primary education and dropped out while the majority finished their primary schooling up to a few years (3years) in high school. Most horticulture respondents were males (61%), while 31% were female farmers.

With regard to land access, some respondents had access to relatively small arable land areas (less than 2 ha), and also had no title deeds for the land. Farmers also highlighted problems associated with pests and diseases and difficulties in accessing credit for production. In transporting output to the market, the farmers cited a number of challenges. These included lack of own transport, high transportation costs, unreliable transport and poor infrastructure. In addition to these challenges, farmers also mentioned other problems related to lack of market information and competition in the marketing channels, fluctuating price of produce, poor roads and lack of market information among others.

5.2.4.2 Results of inferential analysis

The results of the probit model revealed that smallholder farmers are influenced by institutional variables. As indicated earlier, this study set out to determine the impact of institutional factors on horticulture production and marketing in Lesotho. The intention of the probit results was therefore to show the probability that farmers would be satisfied with the production performance of the horticulture farming. The statistically significant variables suggested a very good fit, with a Wald X^2 of 514.42 and log likelihood of -1,119.79 ($p=0.000$). This would mean that the modeled variables, with the exception of standard/grading, had a strong influence to determine whether or not farmers would be satisfied with the outcomes of their farming enterprises.

The results of the analysis does therefore suggest that tenure arrangements are probably one of the serious constraints faced by farmers and about which they expressed the most concern. As a result of these problems, farmers do not receive the guidance they need to apply new production methods, adopt improved inputs and practices, and identify profitable enterprise opportunities, especially in the horticulture sub-sector. This requires the consideration of certain policy options and these are discussed in the following section.

5.3 Conclusion

Smallholder farmers are constrained by a number of institutional factors in production and marketing, making it difficult for them to commercialise. Such institutional factors include negligible support from the extension agents, poor infrastructure, and a severe shortage of market transport and market information, the lack of expertise on grades and standards, some socio-economic factors and a lack of access to contractual markets.

The government and policy makers should implement policies and strategies to eliminate these constraints. Market information and credit supply are some of the major significant institutional factors in production as these help farmers to buy inputs and get their produce sold. Added to those are cooperatives or group action by the farmers in order to participate in contract farming.

For the reasons given above, all possible means of making market information accessible to the farmers must be found. There should be means to ensure that the extension services do not leave the farmers out of the loop with regard market information. The majority if not all of the farmers who took part in this study did not practice grading. This is because the grading of horticulture products involves expertise that small-scale horticulture farmers find difficult to acquire. It is in light of this that necessary skills with regard grading should be developed to maintain the quality and standards of the produce in Lesotho, and it is important that, the extension agents be part of the process.

5.4 General policy recommendations

The following policy recommendations can be suggested on the basis of the empirical results and general comments in this study. Policy in Lesotho must focus on land allocation and provision as a driving force behind increased agricultural production. Marketing of produce among small-holder farmers is mainly through the informal markets in Lesotho. As such, farmers are not contributing directly to the GDP of the country. Strong policies to support farmers have to be enacted to encourage small-holder participation in the formal markets.

Government intervention can also be through price incentives to lure farmers to the formal markets. Government institutions can also play a pivotal role in managing farmer contracts with private organizations that have always profited at the expense of the small-holder farmers in most developing countries. It also remains the responsibility of the government to improve transport provision in rural communities which have poor roads and no public transport. In conclusion, policies must focus on boosting production and at the same time ensuring that viable markets are available for all produce in the country.

5.4.1 Recommendations for farmers

There are certain recommendations which farmers should adopt. They include:

- Need to manage production and marketing risk, in order to minimise production and transaction costs.
- Diversification of enterprises focusing on niche markets where economies of scale are not as important.
- Formation and regulation of farmer groups (cooperatives, producer organisations, out grower schemes, associations and agri-business units) should be promoted and empowered to enable smallholder farmers to position themselves strategically in agricultural supply chains.

5.4.2 Recommendations for agribusiness

- Given the poor performance of agriculture in many SADC countries, contract farming brings about improved marketing opportunities, incentives, and increased income for farmers.
- Low cost credit schemes which enable farmers, especially the resource constrained, to finance production inputs.
- Enhance dissemination of marketing information through marketing information systems/technologies so that farmers have access to real time prices.

5.4.3 Recommendations for the government

The government in Lesotho should be actively engaged in developing policies and institutions to encourage agribusiness investment needs in a large policy context. These include good public governance, a stable political and macroeconomic climate, enforceable commercial laws, appropriate financial services, protection of property rights, and adequate infrastructure. With regard to creating an enabling environment for linking smallholder farmers to formal agribusinesses, several policy recommendations should be adopted. These recommendations include:

1. Market support services
2. Extension and training
3. Infrastructure

4. Government needs to review institutional mandates for influencing, regulating and supporting private sector investment in agribusinesses and agro-industries.

5.4.4 Recommendations for districts initiatives

The agricultural policy of the districts should focus on transforming the sector to generate higher and sustainable farm incomes, which implies increasing rural per capita incomes and employment. A district policy or strategy should therefore include:

- Exploiting the diversity in the districts to unlock its comparative advantage and agricultural potential especially in the rural parts of the country.
- Allow diversity (in needs, production potential, in soil and climate, comparative advantages and stages of development) to stimulate rural development and trade in the country.
- Create a development path which optimises the district bargaining position in intraregional and international markets.
- Encourage participation in national, district and international trade negotiations and agreements.
- Develop and provide demand-driven new extension and advisory services to meet market chain needs.

5.4.5 Recommendations for research

There is a need to establish a regional think-tank, similar to the Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN), which undertakes empirical and policy research in the following areas:

- Analysing country and global trends, changes and factors affecting the transformation of horticulture systems and focusing on the potential effects on smallholder agriculture.
- Characterisation of agro-industries in Lesotho, focusing on leveraging the country's supply chains.

5.5 Future research possibilities

There is a need to do an analysis of the incremental benefit to the farmers due to improvement in transport infrastructure. Most studies have recommended that transport provision be at the centre to cut transaction costs of small-holder farmers, hence a study to investigate the impact of alternative levels of infrastructural development designed towards achieving this objective will go a long way in boosting small-holder agriculture.

Also, there should be further studies on land reform in Lesotho. Even though land reform is not a popular subject in the country as it is in Zimbabwe or South Africa for instance, probably due to the low interest in entrepreneurship in agriculture, there is an expectation that this situation will change as people increasingly see advantages in farming and more and more people become interested. There is interaction among land reform, production and marketing of agriculture products and there is no reason to believe that Lesotho will be an exception to this general rule. Therefore studies have to be conducted on how farmers can have access to land for horticulture production instead of majority of it being used entirely for residential purposes.

REFERENCES

- ADAMS, W.M., 2006. The Future of Sustainability: Re-thinking Environment and Development in the Twenty-first Century. Department of Geography, University of Cambridge, UK.
- ALI, M. & ABEDULLAH, J. 2002. Economic and Nutritional Benefits from Enhanced Vegetable Production and Consumption in Developing Countries. Journal of Crop Production. Vol,6. No.2, pg. 145.
- AKERLOF, G.A. 1970. "The Market for Lemons" Quality Uncertainty with The Market Mechanism," Quarterly Journal of Economics. 488-500.
- BAFFOUR, A.2003. Lesotho- Africa's Best Kept Secret: Pure Majesty. Accessed at:http://findarticles.com/p/articles/mi_qa5391/is_200305/ai_n21330240.24/06/2008.
- BARRETT, C.B. & MUTAMBATSERE, E. 2008. Agricultural Markets in Developing Countries.. in Lawrence E. Blume and Steven N. Durlauf, editors, *The New Palgrave Dictionary of Economics, 2nd Edition* (London: Palgrave Macmillan.
- BARRETT, C.B. & MUTAMBATSERE, E. 2008. Marketing Boards. 2nd in Lawrence E. Blume and Steven N. Durlauf, editors, *The New Palgrave Dictionary of Economics, 2nd Edition* (London: Palgrave Macmillan (Ed).London.
- BECKER, G.S. 1983. A Theory of Competition Among pressure Groups for Political Influence. Quarterly Journal of Economics. Vol, 98,371.
- BEMBRIDGE, T.I. 1986. Problems and Lessons from Irrigation Projects in Less Developed Countries of Africa. Development Southern Africa. 3:4. 613.

- BEMBRIDGE, T.I. 1984. Agricultural Development Problems in Three Rural Areas of Ciskei. University of Fort Hare. Alice.
- BLESS, C. & SMITH, H. C. 2000. Fundamentals of Social Research Methods: An African Experience (3rd Edition). Juta, Cape Town.
- CARNEY, D., and VAN ROOYEN, C.J. 1996. Empowering Small Farmers through Collective Action: The Case of Technology Development and Transfer. Agrekon. Vol, 35: No. 4, 219.
- CHAKELA, Q.K. 1997. State of the Environment in Lesotho. Maseru, Lesotho. National Environment Secretariat. Ministry of Environment, Gender and Youth Affairs.
- CIA World Fact Book, 2008. Central Intelligence Agency.
- COASE, R. 1937. The Nature of the Firm. *Economica*, Vol. 4, pg. 386-405.
- COMBS, W. and HUNTER, JP. 1987. Livestock Marketing and Development in Lesotho. A Report Prepared for Lesotho/USAID/LCRD Project. Lesotho.
- DELGADO, C. 1999. Sources of Growth in Smallholder Agriculture in sub-Saharan Africa: The Role of Vertical Integration of Smallholders with Processors and Marketers of High-value Added Items. *Agrekon*, 38(Special Issue): 165-189.
- DEMSETZ, H. 1967. Toward a Theory of Property Rights: American Economic Review, 347-359.
- D'HAESE, M., VINK, N., VAN HUYLENBROECK, G., BOSTYN, F., KIRSTEN, J., 2003. Local Institutional Innovation and Pro-Poor Agricultural Growth: The Case of Small-Woolgrowers' Associations in South Africa. Garant, Antwerp.

- DIRECTORATE SADC SECRETARIAT, 2008. Implementation and Coordination of Agricultural Research and Training (ICART) in the SADC Region: Situation Analysis of Agricultural Research and Training in the SADC Region. Lesotho.
- DOLAN, C., HUMPHREY, J. and HARRIS-PASCAL C. 1999. Horticultural Commodity Chains: The Impact of the UK Market on the African Fresh Vegetable Industry. IDS Working Paper No. 96. Institute for Development Studies: Sussex.
- DORWARD, A., N. POOLE, J. MORRISON, J. KYDD, AND I UREY. Markets, Institutions and Technology: Missing Links in Livelihoods Analysis. *Development Policy Review* 21 (3) 319-332.
- DORWARD, A. & KYDD, J. 2004. The Malawi 2002 Food Crisis: The rural Development Challenge. *Journal of Modern African Studies*. 42 (3): 343.
- EATON, D. and MEIJERINK, G. 2007. Markets, Institutional Change and the New Agenda for Agriculture. Agricultural Economics Research Institute (LEI) of Wageningen University and Research Center. UK.
- EICHER, C.K. and STAATZ, J.M. 1990. Agricultural Development in the Third World (2nd Ed). The John Hopkins University Press. London.
- EMANA, B. & GEBREMEDHIN, H. 2007. Constraints and Opportunities for Horticulture Production and Marketing in Eastern Ethiopia. www.drylands-group.org. 27/05/2008
- FREEMAN, H.A. 2001. & SILIM, S.S. 2001. Commercialization of Small Irrigation: The Case of Horticultural Crops in Semi- Arid Areas of Eastern Kenya. In SALLY, H. ABERNETHY, C.L. (eds.) Private Irrigation in Sub-Saharan Africa: Proceedings of Regional Seminar on Private Sector Participation an irrigation Expansion in Sub-Saharan Africa 22-26. Ghana, FAO & CTA.

- GARBUTT, N., and COETZER, E., 2005. Options for the Development of National/Sub- Regional Codes of Good Agricultural Practice for Horticultural Products. benchmarked to EurepGAP. Consultation Draft, September 2005, summarized in chapter III of UNCTAD (2007b).
- GEOLOGY AND EARTH SCIENCE, 2005. “Map of Lesotho showing the project areas”, <http://geology.com/world/lesotho-satellite-image.shtml>, 12/04/2011.
- GHATAK, S. AND INGERSENT, K. 1984, *Agriculture and Economic Development*. Harvester Press, Sussex.
- GHATAK, S.I. 1984. Structure and Characteristics of Agriculture in LDCs. Wheatheat.
- GILL, S.J.1993. Lesotho, Kingdom in the sky Janssen Print, Nijmegen, The Netherlands.
- GIRDNER, W. 2008. Integrated Marketing Institutions. Marketing in Our American Economy. Vol, 209.
- GOVERNMENT OF LESOTHO. 2005. Poverty Reduction Strategy Paper, 2004/2005-2006/2007. Government of Lesotho, Maseru, Lesotho.
- GRAIN MARKET RESEARCH PROJECT. 1996. Market Information Bulletin. Ministry of Economic Development and Cooperation, Addis Ababa, Ethiopia.
- GUJARATI, D. 1992. Essentials of Econometrics. MacGraw–Hill, New York.
- HAGEDORN, K.1992. The Impact of Institutional Particularities on Agricultural Policy: In: “Agricultural Restructuring in Southern Africa” (Eds). CSAKI, C., DAMS, T.J., METZGER, D., and VAN ZYL, J. IAAE/Agrecona. Windhoek, Namibia.

- HEINEMANN, E. 2002. The Role and Limitations of Producer Associations. European Forum for Rural Development Cooperation. Montpellier.
- HOFF, K and STIGLITZ, J. E, 1993. Imperfect Information and Rural Credit Markets--Puzzles and Policy Perspectives, World Bank Economic Review, Oxford University Press, vol. 4.
- HOFF, K., BRAVERMAN, A., and STIGLITZ, J., E. (Eds.) 1993. The Economics of Rural Organization. Theory, Practice, and Policy. Oxford University Press, Oxford.
- HUMPHREY, J. 2005. Shaping Value Chains for Development: Global Value Chains in Agribusiness. Research Paper for GTZ, Eschborn, Germany.
- IFAD. 2001. Rural Poverty Report: The Challenge of Ending Rural Poverty. Rome, Oxford University Press. IFAD.
- IITA. 2001. Linking Farmers to Markets – Overview from ACIAR. P.H. News NO.4. IITA.
- KADER, A. A. 2002. Postharvest technology of horticultural crops (3rd Edition). University of California, Oakland.
- KADER, A. A & KITINOJA, L. 2002. Small-scale postharvest handling practices: a manual for horticultural crops (4th Edition). University of California, Oakland.
- KEYNES, J.M. 1943. The international regulation of primary products, reprinted in D. Moggridge (ed.), collected writings of John Maynard Keynes, London: (1980): MacMillan & Cambridge University Press.
- KHERALLAH, M. & KIRSTEN, J. 2001. The New Institutional Economics: Applications for agricultural policy research in developing countries. Markets and Structural Studies Division, Discussion paper No. 41, International Food Policy Research Institute, Washington DC.

- KHERALLAH, M. & MINOT, N. 2001. Impact of Agricultural Market Reforms on Smallholder Farmers in Benin and Malawi. IFPRI Collaborative Research Project. International Food Policy Research Institute, Washington DC.
- KINGDOM of LESOTHO. 1988. The Kingdom of Lesotho. Fifth – Five Year Development Plan. Ministry of Planning, Economic and Manpower Development.
- KIRSTEN, J. F. & VAN ZYL, J. 1998. Defining small-scale farmers in the South African context. *Agrekon*, 37(4): 560-571.
- KIRSTEN, J.F., 2002. Farm-agribusiness linkages in South Africa: Empowering disadvantaged communities through links with agribusiness. FAO.
- KLEIN, P.G. 1999. New Institutional Economics. American Journal of Agricultural Economics 30, 456-463. Georgia.
- LESOTHO BUREAU OF STATISTICS, 2006. “Economic Profile of Lesotho”, Maseru, Bureau of Statistics.
- LOULSEGED, M.K., 2007. Small-scale Horticulture Development Project. Ministry of Agriculture, Kenya.
- MAKHURA, M. T. 2001. Overcoming transaction costs barriers to market participation of smallholder farmers in the Northern Province of South Africa. Unpublished PhD thesis, University of Pretoria, Pretoria.
- MANGISONI, J. 2006. Markets, Institutions and Agricultural Performance in Africa. ATPS Special Paper Series No. 27, the African Technology Policy Studies Network, Nairobi, Kenya.
- MAPS OF LESOTHO, 2010. CIA’s World Fact Book. Countries of the World.

- MAXWELL, S. 2004. Launching the DFID Consultation: “New Directions for Agriculture in Reducing Poverty”. Department for International Development. Available at <http://dfid-agriculture-consultation.nri.org/launchpapers/simonmaxwell.html>.14/04/2011.
- MBETU, R., TSHABALALA,M. 2006. Concept Paper; Lesotho Local Development Programme. UNDP/UNCDF.
- MCMILLAN, J. 2002. Reinventing the Bazaar. New York, Norton.
- MEIJERINK, G. & ROZA, P. 2007. The Role of Agriculture in Economic Development: Market, Chains and Sustainable Development Strategy and Policy papers. Agricultural Economic Research Institute of Wageningen University and Research Centre.
- MHAZO, N., HANYANI-MLAMBO, B., PROCTOR, S., NAZARE, R.M. 2003. Constraints to Small-Scale Production and Marketing of Processed Food Products in Zimbabwe – The Case of Fruits and Vegetables. The University of Zimbabwe, Harare.
- MINISTRY OF AGRICULTURE AND BUREAU OF STATISTICS, 1994. Lesotho Situation Report.
- MINISTRY OF NATURAL RESOURCES, 2000. National Report on Climate Change. Lesotho Meteorological Services. Maseru.Lesotho.
- MOCHEBELELE, M.T., MOKITIMI, N.L., NGQALENI, M.T., STOREY, G.G., & SWALLOW, B.M. 1992. Agricultural Marketing in Lesotho. (Ed). National University of lesotho. Roma, Lesotho.
- MONTSHWE, B. D. 2006. Factors Affecting Participation in Mainstream Cattle Markets by Small-Scale Cattle Farmers in South Africa. Unpublished MSc Agric thesis, University of Free State, Bloemfontein.

MORRISON, J., DORWARD, J., KIDD, J., POULTON, C. & SMITH, L. 2000. Sustainable Livelihoods and New Institutional Economics. DFID Sustainable Livelihoods Programme: Policies, Institutions and Processes. Wye College.

MOSENENE, L.1994. Soil-Water and Conservation Tillage Practices in Lesotho: Experiences of SWACAP. Ministry of Agriculture and Bureau of STATISTICS, Lesotho Situation Report.

Accessed at: <http://www.fao.org/ag/ags/agse/agse-s/3ero/namibia1/c19.htm>.
[13/03/2008](#).

MPHALE M. & RWAMBALI E., 2001. The Institutional Framework for Food Security Policy Decision Making in Lesotho. National University of Lesotho, Lesotho.

NABLI, M.K. & NUGENT, J.B. 1989. The New Institutional Economics and its Applicability to Development. World Development. 17: 1333..

NAKAI, F. 2008. Enabling the Rural Poor to Overcome Poverty in Lesotho.

Accessed at: www.ifad.org/operations/regions/pf.factsheets/lesotho.pdf-
[18/03/2008](#).

NATIONAL ECONOMIES ENCYCLOPEDIA, 2007. Lesotho Agriculture. <http://www.nationsencyclopedia.com/economies/Africa/Lesotho-AGRICULTURE.html>.[24/06/2008](#).

NGQANGWENI, S. 2000, Promoting Income and Employment Growth in the Rural Economy of the Eastern Cape through Smallholder Agriculture, PhD thesis, University of Pretoria, Pretoria.

NGQANGWENI, S. & DELGADO, C. 2003. Decisions on livestock keeping in the semi-arid areas of Limpopo Province. Working Paper, Department of Agricultural Economics, Extension and Rural Development, University of Pretoria, Pretoria.

- NKOSI, S.A., KIRSTEN, J.F., BHEMBE, S.M., and VAN BACH, H.J. 1994. The Role of Traditional Institutions in Rural Development: The Case Bogosi (Chieftainship).Agrekon.Vol, 33 No.4.
- NORTH, D.C., 1984. Transaction Costs, Institutions, and Economic History. Journal of Institutional and Theoretical Economics, No. 140.7-17.
- NORTH, D.C., 1990. A Transaction Costs Theory of Politics. Journal of Theoretical Politics. Vol. 2.
- NORTH, D.C., 1990. Institutions, Institutional Change and Economic Performance. Cambridge University Press, Cambridge, UK.
- OLSON, M. 1971. The Logic of Collective Action: Public Goods and the Theory of Groups. Shoken Books, New York.
- ORTMANN, G.F., 2002. Determinants of the Demand for Regular Farm Labour in South Africa, 1960-2002. AGRICULTURAL ECONOMICS ASSOCIATION OF SOUTH AFRICA. South Africa
- ORTMANN, G.F. and KING, R.P. 2006. Small-scale Farmers in South Africa: Can Agricultural Cooperatives Facilitate Access to Input and Product Markets? Staff Paper P06-4. University of Minnesota.St. Paul.
- PIERES, J.B. 1993. Paradigms deleted: The Material Interpretation of the Mfecane. Journal of Southern African Studies. Vol. 19, Issue 2. 295-313.
- PIESSE, J., DOYER, T., THIRTLE, C., and VINK, N. 2003. The Changing Role of Grain Co-operatives in the Transition to Competitive Markets in South Africa. Research Paper 020, The Management Centre, King's College, University of London, London.

- RANDELA, R., LIEBENBERG, C. F., KIRSTEN, J. F., & TOWNSEND, R. F. 2000. Demand for livestock tick control service in the Venda region, Northern Province. *Agrekon*, 39(4): 644-655.
- RANDELA, R. 2005. Integration of Emerging Cotton Farmers into the Commercial Agricultural Economy. Unpublished PhD Thesis, University of the Free State, Bloemfontein.
- REARDON, T. & BARRETT, C. 2000. Agro-industrialization, Globalization and International Development: An Overview of Issues, Patterns and Determinants. Journal of Agricultural Economics, 23 (3) : 195-205.
- ROOYANI, F and SCHMITZ, G. .1987.Lesotho: Geology, Geomorphology and Soils. National University of Lesotho. Roma.
- ROTHSCHILD, M., and STIGLITZ, J. E. 1976. Equilibrium in Competitive Insurance Markets. *Quarterly Journal of Economics*. Vol, 90.629-649.
- RUTTAN V.W. AND HAYAMI, Y. 1984. Toward a Theory of Induced Institutional Innovation,” Journal of Development Studies, Vol, 20. 204-224.
- RUTTAN, V.W. 2004. Controversy About Agricultural Technology Lessons From the Green Revolution. *Int. J. Biotechnol.* 6. 43 – 54.
- SCHRADER, L.F. 1986. Responses to Forces Shaping Agricultural Marketing: Contracting. American Journal of Agricultural Economics. Vol. 68. 1161-1166.
- SECHABA CONSULTANTS, 2000a. Poverty and Livelihoods in Lesotho. Maseru, Lesotho.
- SHEZI, N. 2005. The Kingdom of Lesotho. (Mimeo)

- SPENCE, A M. 1973, Job Market Signaling. Quarterly Journal of Economics Vol, 87, 355-374.
- SOKHELA, M.P., 1990. A Comparative Study of two Small-Scale Sugar Cane Growing Communities in the Inanda District of KwaZulu Natal. MSc. Agric. Thesis. University of Fort Hare, Alice.
- SYKUTA, M.E., AND CHADDAD, F.R., 1999. Putting Theories of the Firm in Their Place: A supplemental Digest of the New Institutional Economics. Journal of Cooperatives, 14. 68-76.
- THE ECONOMIC INTELLIGENCE UNIT. 2004. Lesotho: Transport and Communication.
- CIA. 1998. THE WORLD FACT BOOK 1998, Washington DC, The Central Intelligence Agency
- CIA. 2008. THE WORLD FACT BOOK 2008, Washington DC, The Central Intelligence Agency
- TURNER, S. 2001. Livelihoods in Lesotho. Maseru. Lesotho. CARE Lesotho, Maseru.
- TURNER, S., CALDER, R., GAY, J., HALL, D., IREDALE, J., MBIZULE, C., MOHATLA, M. 2001. Livelihoods in Lesotho. CARE Lesotho, Maseru.
- UPHOFF, N. 1993. Grassroots Organizations and NGOs in Rural Development: Opportunities with Diminishing States and Expanding Market. *World Development* 21(4): 607-622.
- VAN HUYLENBROECK, G., & ESPINEL, R. L. 2007. Importance of institutions and Governance Structures for Market Access and Protection of Property Rights of Small Farmers in Developing Countries. In E. Bulte & R. Ruben (Eds.), *Development Economics Between Markets and Institutions: Incentives for Growth, Food Security and Sustainable Use of the Environment* (pp. 327–344). Wageningen: Academic Publishers.

- VAN ZYL,J., VAN SCHALKWYK,H.D & DOYER,T.O. 1996. Lesotho: Impact Analysis of Deregulation of the Grain Sector. Ministry of Finance: Government of Lesotho. Maseru, Lesotho
- VEERAMATHA, C. S. 2005. Role of NGOs in the Prevention of HIV/ AIDS in Karnataka.
- VELLA, K. 2003. Assessing the Institutional Governing the Australia's Outback Resources. Australia. CSIRO, Australia.
- WATKINS, T. 2009. The Transactions Cost Approach to the Theory of the Firm, <http://www.sjsu.edu/faculty/watkins/coase.htm>, accessed on 15 February, 2011.
- WEINBERGER, K. AND T. A. LUMPKIN. 2005. Horticulture for Poverty Alleviation: The Unfunded Revolution. 20. Working Paper no. 15, Shanhua: AVRDC - The World Vegetable Center, Taiwan
- WILLIAMSON O.E.2000. The New Institutional Economics: Taking Stock, Looking Ahead. Journal of Economic Literature 38 (3). 595-613.
- WILLIAMSON, O.E.1985. The Economic Institutions of Capitalism: Firms, Markets and Relational Contracting. New York,NY, Free Press.
- WILLIAMSON O. E. 1975. Understanding the Employment Relation: The Analysis of Idiosyncratic Exchange, The Bell Journal of Economics, 6. Free Press, New York .
- WORLD BANK, 1995. Lesotho Poverty Assessment. Human Resource Division, Southern Africa Department, Africa Regional Office.

WORLD FOOD PROGRAMME, 2008. Addressing the Global Food Crisis: Key Trade, Investment and Commodity Policies in Ensuring Sustainable Food Security and Alleviating Poverty. United Nations, Italy.

WORLD FOOD PROGRAMME, 2009. Food Shortages in Lesotho Affecting HIV-Positive People: The Facts.

WORLD HEALTH ORGANISATION, 2009. WHO Country Cooperation Strategy 2008-2013 Lesotho. Regional Office for Africa. Lesotho.

YUNEZ-NAUDE, A and TAYLOR, E. J., 2001. The Determinants of Nonfarm Activities and Incomes of Rural Households in Mexico, with Emphasis on Education, World Development, Elsevier, vol. 29,561-572

APPENDIX 1

QUESTIONNAIRE

SECTION A: GENERAL INFORMATION

a) Name of interviewee	
b) Location	
c) Name of the Village	
d) Telephone/Cell number/ Postal Address	
e) Time taken for the interview	

SECTION B: DEMOGRAPHIC INFORMATION

B.1. Gender household head in years	Male	1
	Female	2

B.2. Age household head in years		Years
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B.3. Marital Status	Single	1	Married	2	Divorced	3	Windowed	4
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B.4. Household size	
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B.5. Indicate the number of years of your education experience	
--	--

B.6. Are you engaged in any non-farm employment?	Yes	1
	No	2

SECTION C: RESOURCES

C.1.What size of the arable land do you have access to in hectares?	
C.2.Do you have any property rights to land or any equipment?	Yes
	No

C.3.What vegetables and fruits have you produced in the past 12 months?

Vegetables and fruits	Area	Quantity/ha	Price/unit
1			
2			
3			
4			
5			

C.4. How much family income made from non-farm sources?	
---	--

C.5 How much Revenue (R) do you make?	R
C.6 How much Revenue per Ha do you make?	R/Ha

SECTION D: PRODUCTION ASPECTS

D.1.Type of farming (Name one)	Crops - Irrigation	1
	Crops - Dryland	2
	Livestock	3
	Fruit Irrigation	4

D.2. Why did you choose this type of farming?

D.3 Do you have any problem(s) with regards the weather during the production seasons?	Yes	1
	No	2
D.4 Are there any pests that are hindering your production and the quality of your produce?	Yes	1
	No	2
D.5 If 'Yes' on D.4. What are these pests?		
D.6. Do you have any water conserving practices?	Yes	No

D.7 If 'Yes' on D.6, what are they?
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SECTION E: FINANCIAL CONSTRAINTS

	Yes	No
E.1. Do you need credit for your production enterprise?	1	2
E.2.Do you have access to any production loans e.g. capital?	1	2
E.3.Have you ever been denied a production loan?	1	2

E.4.If 'Yes' on 'E.3' above, what were the reasons?	Lack of invoices of what has been sold	1
	Non residency of the community	2
	Lack of a performing account	3
	Lack of collateral or security (physical assets -farm machinery and livestock)	4
	Other (Specify)	5

\

E.5.To which sources of credit do you have access?	commercial banks (Formal)	1
	agricultural cooperatives (Formal)	2
	Other (Specify) (Informal)	3
E.6 Do you have any access to labour?	Yes	1
	No	2

SECTION F: MARKET CONSTRAINTS

F. 1 How far is it to get to your main market outlet? State in km		
F. 2 How do you transport your produce to the market? Tick	Own transport	1
	Public transport	2
	Hired transport	3
	Wheel barrow	4
	Other (Specify)	5
F.3 Do you encounter transport problems when selling/taking your produce to the markets?		Yes 1
		No 2

F. What problems do you face in transporting your produce? Tick			
Small size of transport	Lack of transport	High transport cost	Other (Specify)

F.4 Do you have any access to road infrastructure?	Yes
	No
F.5 Do you have accesses to contractual markets (formal or informal) where to sell your produce?	Yes
	No

F.6 If “yes” on F.4 and 5 above, state the problem(s)? (Fill the table below)

1)
2)
3)
4)
5)

F.6 Is your produce graded before it goes for sale?	Yes	1
	No	2

F.7 If yes to F.6 above, do you have problems meeting the grading standards?		Yes	1
		No	2
F.8 What happens to the produce with poor grade?			
F.9 Where do you market your produce i.e. Market type (Formal / Informal)	Locally (Informal)	1	
	Hawkers (Informal)	2	
	Fruits and vegetable shops (Formal)	3	
	Other (Specify) (Informal)	4	
F.10 Is there any produce that you could not sell in 2007?		Yes	1
		No	2
F.11 Are you satisfied with the market in your district		Yes	1
		No	2

F. 12 Name the products and the reasons? (If yes on E4)

Products	Reasons
1)	
2)	
3)	
4)	
5)	

F.13 What major marketing constraints are you facing currently?

Constraints
.....
.....
.....

SECTION G: PRODUCTION CONSTRAINTS

G.1 Do you have access to agricultural land?	Yes	1
	No	2
G.2. Do you have title deeds to the land that you have?	Yes	1
	No	2
G.3.How did you acquire this land? (Can tick more than one)		

Bought (Title deed)	1
Leased/Renting	2
Inherited	3
Given by government	4
Share cropping	5
Other (Specify)	6

<p>G.4. Are you satisfied with the arrangement of usage on the land that you have? Explain</p>
--

G.5. What major production constraints are you facing currently?

<p>Constraints</p> <p>..... ..</p> <p>.....</p> <p>.....</p>		
G.6 Are you generally satisfied with your production?	Yes	1
	No	2
G.7 Do you have access to storage facilities for your produce?	Yes	1
	No	2

SECTION H: INPUT

H.1 Do you have access to production inputs	Yes	1		
	No	2		
H.2. Do you use fertilizers when growing crops?	Yes	1	No	2
Options	Inorganic	Organic	Both	
H.3. Types in use	1	2	3	
H.4. Type preferred and why?	1	2	3	
H.5	Reason			

H.6.Are these/this fertilizer(s) readily available?	Yes to 1 only	1
	Yes to 2 only	2
	Yes to 3	3
	Not at all	4

H.7.If 'No' on H.5, what are the reason(s)?	Lack of finance	1
---	-----------------	---

	Delivery problems (e.g. poor transport network)	2
	Not available on the market on time	3
H.8. How much does it cost you to buy the following inputs?	Fertilizers	1
	Seeds	2

SECTION I: INFORMATION

I.1 Do you have access to any source of information?	Yes	1
	No	2

I.2. How do you obtain information on the available market?

Radio	Television	Newspapers	Internet	Extension	Friends	Other :
1	2	3	4	5	6	7

--

I.3. Are you a member of the District Farmers Association (DFA)?	1	Yes
	2	No

I.4. What does the association do for you?

.....

I.5. If 'Yes' on I.3, are you satisfied with the Association in terms of general information provision?	1	Yes
	2	No

I.7. If 'No' on I.6, please give Reasons why?

.....
.....
.....

I.8. which of the following sources provides you with farming advice (basic support structures)?

Government agricultural extension work	1
Private extension workers	2
Development agencies	3
Friend (Other farmers)	4
Other (Specify) NGO'S?	5

I.9. Which of the following skills do you possess? (Tick)

Skill	Yes	No
Crop production		

Financial management		
Marketing		
Farm management		
Record keeping		
Other (Specify)		

I.10 Which farm records do you keep?

Sales	Costs	Other

SECTION J: EXTENSION SERVICES

J.1. Have you ever received any assistance from extension workers	Yes	1
	No	2

J.2. How often did extension officers visit your farm?	Once a week	1
	Once a month	2
	Never	3
	Other (Specify)	4

J.3. How do you view the quality of the extension service that you receive?

Excellent	1
Very good	2
Satisfactory	3
Poor	4
Very poor	5

Appendix II:

Chapter Contributed to: Obi, A (2011), *Institutional Constraints to Small Farmer Development in Southern Africa*, Wageningen, Wageningen Academic Publishers, pp. 167-183.

Chapter 8

Obstacles to the profitable production and marketing of horticulture products in Lesotho: an offset-constrained probit modeling of farmers' perception

Ajuruchukwu Obi and Litsoanelo Mphahama

Abstract

While Lesotho's agriculture stopped being a source of government revenue more than a century ago, it still fulfilled important household subsistence needs. But even that limited role is threatened as farm sizes and participation rates contract even further in the face of a multitude of factors. At the same time, Lesotho's population, especially those residing in the lone modern metropolis, Maseru, continues to be more sophisticated, with consumption patterns that are comparable to those in other modern economies. Why is the country's agricultural sector not rising to the occasion to meet the needs of the growing urban population? The preamble and foreword to the Vision 2020 document tried to address this question but they remain inconclusive. What are the reasons for the poor performance of horticultural products in Lesotho despite growing demand for the products worldwide and in the country? Are there important non-price factors that we should take into account in deciding on appropriate policies for revitalizing the farm sector in a country where few alternative opportunities for employment exist? These were some of the questions this chapter set out to address by examining production and marketing decisions and results in four of Lesotho's ten districts during 2009. There are indications that property rights, the agricultural extension service and the condition of the physical infrastructure may be crucial elements in finding answers to these problems. The results particularly point to the difficulties in accessing markets and land which remain important institutional constraints to horticulture production and marketing in Lesotho. Recommendations are made for these issues to be incorporated into the Vision 2020 process, among other processes underway to address the growing national food insecurity and enhance livelihoods in general.

8.1 Introduction and problem context

Lesotho is a small, predominantly mountainous enclave country, entirely landlocked by South Africa. It is one of the poorest countries in the world with an economy dependent mainly on livestock-based agriculture and remittances from the export of labour services to South Africa. In the late 1990s, water from the massive Lesotho Highlands Water Project (LHWP), emerged as an important source of national budget revenue as the country began to export the commodity to South Africa. The country's mountain grasslands on the eastern boundary with South Africa are very rich in biodiversity. Lesotho's agriculture has been in decline for several years. It is hardly possible to recall that Lesotho ever produced an agricultural surplus, but the fact is that the country was a net exporter of maize until 1865 (Gill, 1993). In the

foreword to the National Vision 2020 document launched in 2005, the Prime Minister of Lesotho, Professor Pakalitha Mosisili, recalled the time following the discovery of diamonds in Kimberly (Northern Cape Province of South Africa), in 1866, when Lesotho earned the reputation of being the *Granary of Southern Africa*, as the major supplier of wheat to meet the unprecedented demand for grains for a population that had come into sudden wealth (Government of Lesotho 2005). But this seems to have been short-lived as hostilities from the Boers intensified, culminating in the destruction of the grain farms of Lesotho, eventually chasing the Basotho out of the fertile farm areas to the west of the Caledon River (SA History).

Since then, the sector's contribution to GDP has been declining, from over 30% in 1970 to about 20% in the mid-1990s (Moyo, 1993), and just about 16% currently (CIA, 2008). Estimates of the sector's contribution are available for several years (FAO/WFP, 2003, 2004) and reflect the persistent downward trend. Correspondingly, agricultural production has been on the decline, resulting in a complete reversal of the country's status, to a net importer of agricultural produce. By the mid-1980s, the country was only able to produce 14% of domestic food consumption needs (Government of Lesotho, 1996). Studies conducted within the last decade suggest that agricultural production has fallen further, with the country importing up to 95% of its domestic food requirements (Van Schalkwyk, 2002). The situation is much worse today as the food and humanitarian crises in the region deepens.

Despite this gloomy picture, the sector is the most important employer of labour in the domestic economy. According to Moyo *et al* (1993), the sector employed about 86% of the population over much of the 1980s. The figure has fallen considerably since then and in 1999 stood at 57% of the domestic labour force (EIU, 2002). Official statistics provided by the Ministry of Agriculture (GoL, 1996) indicate that despite its poor overall performance, as much as 23% of the rural population depend entirely on agriculture for food and income, while a further 32% regard agriculture as a secondary source of livelihood (GoL, 1996).

Government and the development community have responded to the decline of agricultural production in a number of different ways. In the 1970s and 1980s massive investment of resources were made in pursuit of self-sufficiency which reflected the dominant view of food security as a demand-side problem (Sen, 1981 and World Bank 1986). But repeated failures of the type and scale aptly captured by Ferguson (1994) in his book, *The anti-politics machine*, engendered an atmosphere in which Lesotho's agriculture hardly excited much intellectual and political interest. A situation was thus created in which Lesotho's agriculture was virtually written off as irrelevant to the country's long-term development (Mphahama, 2010). Attention then shifted to water resource development culminating in the huge construction programme under the Lesotho Highlands Water Project.

But neglecting agriculture in a country with virtually no non-agricultural sector of note has turned out to be a huge mistake. Current rates of unemployment are put at 45% and they have never seemed better (CIA, 2008). On top of this, the current food/humanitarian crisis facing the country has been so devastating that it has sent the development community into a panic. The Highlands Water Project has also failed to deliver the expected employment and income relief and has rather created

enormous social and political tensions, including displacement of populations. The production problems of Lesotho's agriculture, or the supply-side questions, are complicated by the constraints in both internal and external marketing (Mphahama, 2010). The country's negative terms of trade for most agricultural and industrial products are well known. The internal road network and other infrastructure continue to pose serious constraints to the easy movement of agricultural produce in the country, creating a situation where consumers are motivated to purchase from South Africa. At the same time, internal cost structures escalate domestic production costs with the result that export production of produce with excellent production prospects in the country seems unattractive.

Expectedly, the average growth rate of the economy has slowed in the 1990s, from an average per capita growth rate of 5.1% in the first half of the decade to an average per capita growth rate of 4.7% in the second half, up to 1998. The 2003 Human Development Report of the United Nations Development Programme (UNDP), ranked Lesotho 137th out of 175 countries (UNDP, 2003). Since then, the country has fallen further to rank 156th out of 182 countries (UNDP, 2009). Further, recent developments in the Republic of South Africa, including technical changes in mining and the demands of democratic structures mean that Lesotho must look internally for solutions to its economic problems. This realization has recently created immense interest in the formulation of an internal marketing policy targeting a range of agricultural commodities. Over the years, the government has been promoting efforts to diversify away from foodgrains and invest in sub-sectors in which the country has comparative advantage. Because of its climate, abundant water supply and pest-free status, horticulture has been identified as a sub-sector with enormous comparative advantage (Mphahama, 2010). There is also evidence that demand for horticulture products is growing especially in the light of increasing awareness about the role of horticulture products in boosting resistance against diseases.

On the basis of previous work in Lesotho the following four main factors should be considered in programmes to boost horticulture production.

- the key physical production factors such as the infrastructural setting and land tenure arrangements;
- human capacity situation including the capacity of the extension systems and the availability of relevant skills for policy analysis and leadership;
- the credit system; and
- the marketing system.

Recent studies in a number of countries, including Ethiopia (Feleke *et al.*, 2003; Alemu *et al.*, 2003) suggest that these factors are important and that institutional constraints have an impact on farmers' responsiveness to policy changes. The fact that 15 years after the potential for commercial profitability of asparagus production was established (EFP, 1995), little or nothing is happening in that direction leaves little doubt that institutional constraints could be important in Lesotho. Further, the recent experience with the introduction and popularization of *Paprika* in 1999 is quite instructive and demonstrates that Lesotho farmers are indeed receptive to new ideas. In that particular instance, Lesotho farmers enthusiastically embraced the new crop which was however not suited to the country's agro-ecological conditions and thus not likely to have sustained positive impact on the farming system and farmers'

welfare. This experience suggests that a well-structured institutional arrangement, integrating the full spectrum of research, extension and knowledge networks, should be able to recognize these limitations and insulate farmers from exploitation. It is necessary to examine these factors, among many, and determine the extent to which they engender or inhibit agricultural development and thus form a basis for recommending interventions that strengthen the relevant institutions that cater to them. On the basis of international experience, it is possible to posit that institutional development would contribute to more effective utilization of the physical, human, and financial resources placed at the disposal of Lesotho under on-going or prospective technical cooperation agreements.

The purpose of this study was to identify the key institutional factors constraining the production and marketing of horticultural products in Lesotho. More specifically, the intention was to:

- investigate factors that affect horticulture production and marketing in Lesotho;
- make policy recommendations on the basis of the results.

8.2 Study area

Geographically, Lesotho is an enclave, being completely surrounded by only one country, South Africa, to make it one of only three such entities in the world (the others are the Republic of San Marino, an enclave in Italy, and the Vatican City, an enclave in the city of Rome, also in Italy). The country is located between Latitude 28°S and 31°S, with Longitude 27°E and 30°E, and has a temperate climate with cool dry winters and hot wet summers (Baffour, 2003). Its peculiar mountainous terrain has earned it several nicknames, some of which are: 'The mountain kingdom' or 'the roof of Africa' or 'the kingdom in the sky'. The mountains actually cover approximately 65% of the total land area, justifying the identification of the country with its mountain topography. It is often said that the lowest points in Lesotho are higher than most other places in the world, averaging about 1,500 metres, with the highest point of 3,300 metres, *Thabana Ntlenyana*, being the highest in Southern Africa. The country has a total land area of about 30,340 square kilometers.

The country is divided into 10 districts, namely: Butha-Buthe, Mokhotlong, Leribe, Teyateyaneng (also known as Berea), Thaba-tseka, Maseru, Mokhotlong, Mhaleshoek, Qacha's nek, and Mafeteng. These districts are distributed across the different agro-ecological zones of the country. For purposes of this study, one district, namely Thaba-tseka was chosen from the mountains, Mafeteng and Butha Buthe were selected from the foothills, while one, Teyateyaneng was selected from the lowlands (Lesotho Bureau of Statistics, 2006). The distribution of the selected districts is shown in the Map of Lesotho presented in Figure 8.1.

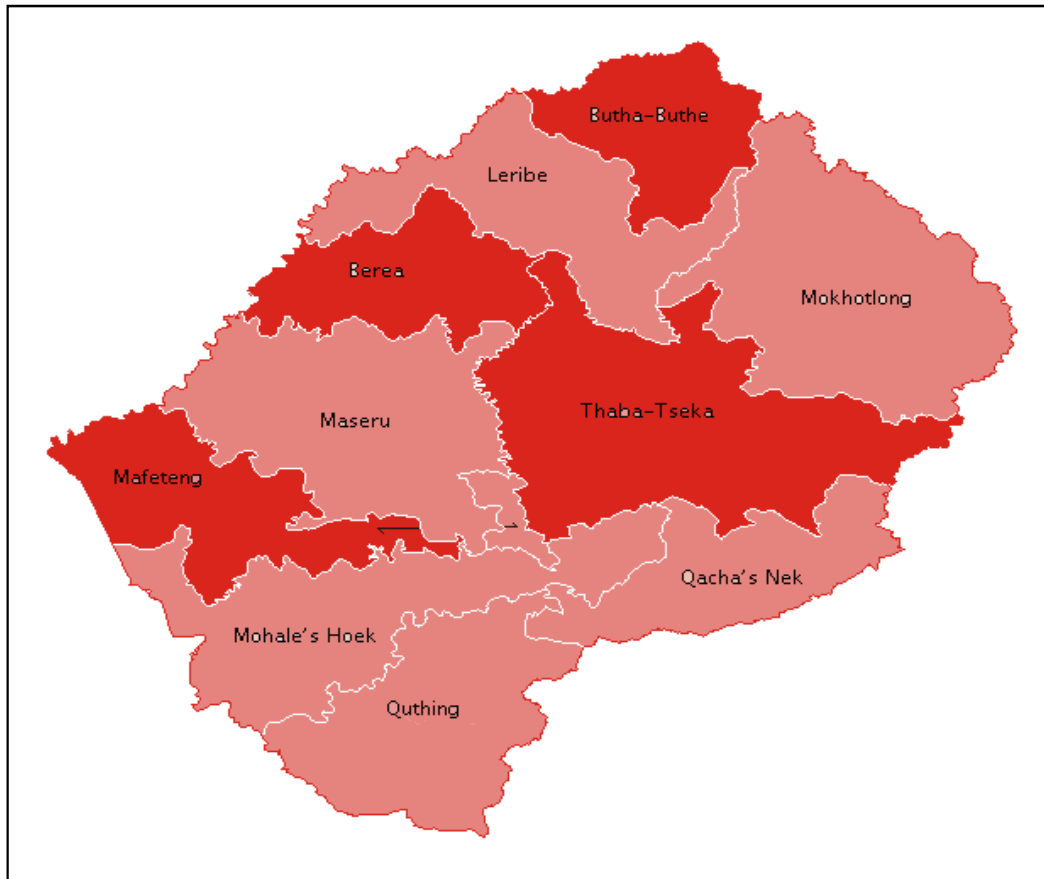


Figure 8.1. Map of Lesotho. Districts where the study was conducted are marked dark gray (Lesotho Bureau of Statistics, 2006).

8.4 The data

The variables examined in the study are presented in Table 8.1. Research examining institutional constraints to smallholder development as part of other studies have generally included these variables.

Table 8.1. Definition and description of variables examined in the study

Variable	Variable description	Anticipated sign +/-
<i>Dependent</i>		
Production satisfaction	dummy: satisfied = 1, 0 otherwise	
<i>Independent</i>		
Gender	dummy: male = 1, 0 female	+/-
Age	continuous	+
Years of education experience	continuous	+
Market information	dummy: have access = 1, 0 otherwise	+
Access to production skills	dummy: have access = 1, 0 otherwise	+
Visits by extension personnel	categorical: yes = 1, 0 no	+
Extension quality service	dummy: good = 1, 0 otherwise	-
Grading to market standards	dummy: meet standards = 1, 0 otherwise	+
Access to title deeds	dummy: have access =1, 0 otherwise	+/-
Transport	dummy: yes=1, 0 otherwise	+
Membership of farmer association	dummy: yes=1, 0 otherwise	
Storage	dummy: yes=1, 0 otherwise	+
Contractual markets	dummy: yes=1, 0 otherwise	+
Road infrastructure	dummy: yes=1, 0 otherwise	+

The signs of the coefficients show the direction of influence of the variables on the dependent variable. It follows that a positive value indicates an increase in the likelihood that there will be a change to the alternative option from the baseline to the alternative (Gujarati, 1992). Hence, in this study, a positive value implies an increase in the probability of increasing the production and marketing of horticultural products.

a. Gender (GNDR): Gender is clearly an important factor in horticulture production and marketing especially in a country like Lesotho where gender-based stereotyping is the norm. Decision making roles are normally divided between men and women depending on the nature of the economic or social activity involved. In general, the legal system regards women as minors and do not have the power to make important decisions in the household in relation to resource allocation. But the situation becomes complicated when a woman is either widowed or has a non-resident spouse who is probably employed in South Africa in a variety of income generating activities not readily available in Lesotho. In such cases, women may make decisions when it comes to growing of crops, but under clear delegation.

b. Age (AGE): This variable is the actual age of the household head/respondent measured in years. According to Bembridge (1984), age determines the behavioral patterns of a household. Younger farmers are expected to be more energetic in doing

arduous farm tasks than older farmers who are likely to avoid the more arduous operations and settle for those that are less physically demanding. Age is also associated with experience and the length of time over which an individual has been accumulating capital for investment in farm operations. Younger farmers are expected to be less technically experienced as well as have less capital at their disposal.

c. Years of education (YRSEDU): Bembridge (1984), confirmed the importance of education in decision-making processes with implications for capital accumulation and adoption of innovative practices in production and marketing. In agricultural production, education plays a significant role in the extent to which farmers process information about new inputs and methods and the adoption of improved agricultural techniques. The absence of education is therefore expected to have a negative impact on production and marketing of horticultural produce. It is therefore hypothesized that there is a positive correlation between education and horticulture production and marketing.

d. Production satisfaction (PRDNSATISF): This dependent variable measure whether a farmer is satisfied with his production or not. The variable is for production rates, participation and level but with emphasis to production satisfaction of the farmer, and this variable explains the production information of the farmers which is notoriously unreliable at times as farmers tend to inflate for prestige purposes or deflate to evade taxation. But when they are not required to state how much they have produced in a season, they are more likely to be honest as to whether or not they are satisfied.

e. Contractual market (CONTRACTMKT): This dependent variable measures whether or not the farmer has access to market contract or not. The relationship between market contract in horticulture production and especially marketing is an important one and at the same time hard to attain because, for a farmer to have access to a market contract, there are certain qualifications a farmer has to meet or have. For instance like taking part in the formal market or having access to capital or credit. On the other hand, contracts ensure the availability of a guaranteed market for the farmers, thus promoting market participation in horticulture production because it is through contracts that farmers are assured of readily available inputs, ready and accessible market, support and credit and loans to buy inputs at lower prices.

f. Market information (MKTINFOR): Information in farming business is an important determinant of communication. The variable, access to market information was measured by the farmers' ability to access market information and their ability to interpret it. To capture this variable, farmers were interviewed on communication networks that are accessible to them like radios, TVs, etc. The communication could either be on the availability of markets or inputs being sold at a lower price for the farmers. Access to information has been set as a dummy variable, where a household with access to information takes the value of one and a household that has no access to information takes a value of two. Access to information was expected to positively influence production and market participation; implying that households with access to information would be more likely to participate in both.

g. *Extension visits (EXTNVISITS)*: Contact between the extension officers and the farmer is important, and this variable which is on its own an important source of information for farmers (Enki, 2001). Denoted by one if farmers are being visited and two if otherwise; extension visits have a positive effect on farming.

h. *Quality service of extension (QUALITYSERV)*: Access to extension services is an important variable in the farming sector because through this service, farmers gain access to farming advice and farming knowledge. New ways and techniques of farming are also provided by the extension service. Farmers were asked to rank it from excellent, very good, satisfactory, poor and very poor. The better the service provided by the extension, the better the quality of farming business there will be. In this study, it is hypothesized that the quality of extension service provided to the farmers is poor. This variable is analysed as categorical.

i. *Grading to market standard (STDGRADING)*: In this study, there are grading standards which small-farmers have difficulty meeting and are therefore excluded from profitable markets. According to Kherallah and Kirsten (2002), there are regulations imposed by markets to meet consumer demand and create market niches. These regulations are trickling down to the production level thereby affecting the structure and characteristics of the market downstream.

j. *Title deeds (TITLEDEEDS)*: This variable represents serious constraints especially when it comes to land. Farmers without title deeds to land but are in the farming business, are highly constrained as the land could be re-possessioned from them at any time. This variable is therefore hypothesized either negative or positive for those farmers who have acquired title deeds.

k. *Transport (TRANS)*: Transport ownership was hypothesized to be a huge constraint because many farmers did not have their own means of transporting the produce to the markets. According to the interview findings, many farmers used public transportation when others used hired transport which was confirmed to be costly and unreliable as owners of the cars were sometimes not available. In addition, availability of transportation helps reduce long market distance constraint.

l. *Road infrastructure (RDINFR)*: Road infrastructure is measured by the accessibility of road networks that are adequate to farmers to be able to travel to the nearby or furthest market and their conditions. The poorer the road condition, the harder it is for farmers to travel and transport their products and according to the findings of this study, road infrastructure is one constraint that is hindering the marketing process.

m. *Membership of farmer association (ASSMEM)*: This variable was deemed important because in Lesotho there is a well-developed system of traditional cooperation which small farmers draw upon to address labour bottlenecks and other production constraints. The *letsema* has been in operation for centuries and entails farmers working in groups to address a problem by collective action. It was also observed that some farmers join the Districts Farmer Association (DFA) which serves other objectives including extension. Through this Association small farmers are able to access inputs and credit. The work of Ostrom and others show that customs and social conventions designed to induce cooperative solutions can

overcome the collective action difficulties and help achieve efficiency in resource use (Nabli and Nugent, 1989).

8.4 The model and analytical framework

In order to conclude as to the extent to which horticulture production was constrained, a suitable response or dependent variable should be specified and examined for possible variations under alternative scenarios. The most popular and intuitively appealing variable in this regard is farm revenue. The impact of key institutional variables on the farm revenue can then be examined as a basis for judgment one way or another. But farm revenue is an inconclusive guide in an environment where farming is not completely oriented to the market, making it difficult to accurately monetize the benefits from farming. Also, there is the notorious tendency of traditional households to give unreliable information about their production performance depending on their perception of the purpose of the investigation. However, when people are asked to simply state whether or not they are satisfied with a particular situation, experience shows that they tend to provide more reliable information. For this reason, the study decided to model production satisfaction as a binary choice variable such that when a farmer reports satisfaction with the previous year's production it is scored one (1) or zero (0) otherwise. Specifying such a model is no different from the approach taken by D'Haese *et al.* (2003) in analyzing how participation decisions are influenced by a set of institutional factors in the former Transkei region.

Of the large number of variables obtained through the sample survey, the institutional factors can be identified as: standard and grading, land access, transport availability, possession or otherwise of title deeds to land cultivated, extension services, and availability of markets. The hypothesis to be tested is that the probability that farmers will be satisfied with the outcome of their production activities will depend on several elements in the environment of the farmer. For instance, where the farmer has access to land and other productive resources, extension services, title deeds, etc., the chances are that the farmer is likely to perform at levels that he/she finds satisfactory. But this attribute as well as the possible other factors influencing it are unobservable which makes the problem one that is amenable by any of the qualitative choice models such as probit, logit or tobit models (Greene, 2000). The probit model is chosen in this particular study. The Probit model was necessary to avoid selection bias in the sample (Yúnez-Naude and Taylor, 2001).

To proceed, the model of production satisfaction can be stated in general terms as follows:

$$Y = PS = f(X_1, X_2, \dots, X_n) \quad (1)$$

Where:

Y is the dependent variable that captures what the small producers think about the results they are achieving in their horticultural production, and the **X**'s in the model represent the set of institutional factors already mentioned above.

Such a model can be specified as follows:

$$y_i^* = \beta_1 + \beta_2 x_{2i} + \dots + \beta_k x_{ki} + \mu_i \quad (2)$$

But the handicap is that y_i^* cannot be observed in reality but can only be inferred. This means also that its exact determinants can only be estimated on the basis of the dummy variables constructed for this purpose which can be defined as:

$$y_i = 0 \text{ if } y_i^* < 0 \text{ and} \quad (3)$$

$$y_i = 1 \text{ if } y_i^* \geq 0 \quad (4)$$

From the foregoing equations, it can be deduced that:

$$\text{Prob}(y = 1) = \text{Prob}(u_i > -\beta' x_i) = 1 - F(-\beta' x_i) \quad (5)$$

which assumes that F is the cumulative distribution function for the error term u . Under the assumption that the error term, u , is normally and independently distributed, i.e. $(N(0, \sigma^2))$, we can define a probit model as:

$$F(-\beta' x_i) = \int_{-\infty}^{-\beta' x_i / \sigma} \frac{1}{(2\pi)^{1/2}} \exp(-t^2/2) dt \quad (6)$$

The econometric software Stata-10 is able to calculate the probit coefficients and estimate maximum likelihood ratios based on which model validity can be ascertained. Marginal effects of the independent variables were also calculated and interpreted.

8.5 Results and discussion

The summary statistics of the variables comprising demographic and some production/marketing data are presented in Table 8.2. In terms of the demographic characteristics of the sample, the summary statistics suggest that the majority of the farmers were male, aged about 60 years on average (ranging from 38 to 82 years). All surveyed household heads had had some education, with average years of schooling of 5.7 years (the raw data showing that years of schooling ranged from 1-15 years). Household size averaged about 8.02 persons, surprisingly large although the skewness suggests that more households had fewer than the average household size.

It was deemed necessary to summarize data relating to productive asset ownership and perceptions about production and marketing activities of the households. The indication from the results is that farm sizes are generally small, property rights are limited and that few persons that had access to land actually owned them (based on the possession of title deeds to the land). Importantly, only about a quarter of the surveyed households expressed satisfaction with the results they obtain from their farming activities in respect of horticultural production. There was also evidence that the households experienced serious problems with marketing of produce where nearly half the sample had serious transport problems and farmers were about 4 kilometres away from the nearest market.

Table 8.2. Descriptive statistics of sample households in Lesotho.

Variable	Mean	Std Deviation	Skewness
Gender	0.61	0.490	-0.458
Age	60.7	8.794	-0.500
Education	5.7	2.561	1.279
Household size	8.02	2.365	-0.118
Land holding	3.2	1.234	0.525
Property rights	0.35	0.479	0.639
Title deeds to land	0.39	0.490	0.458
Satisfied with production	0.28	0.451	0.995
Non-farm employment	0.42	0.496	0.329
Revenue per ha	4,870	>2 million	1.295
Land access	0.48	0.502	0.081
Market distance	3.9	1.713	1.215
Transport problems	0.49	0.502	0.041

Due to suspected multicollinearity, the software dropped all but the 7 variables presented in Table 8.3. The variable for membership of farmer associations was also dropped, making it impossible to assess the influence of this variable which is intuitively considered useful and will be investigated separately. The probit model to determine the impact of the set of institutional factors on the attitude of the farmers to the profitability of the horticulture sector is presented in Table 8.3. The intention was to show the probability that the farmer would be satisfied with the production performance of his/her horticulture farming as a result of a number of institutional influences in the farming environment. The analysis imposed revenue per hectare as an offset which could still be influential despite the difficulty in directly modeling that variable in a society where there are valid concerns over its reliability when based on farmer's recall. The results are presented in Table 8.3.

Table 8.3. Log-likelihood estimates and goodness-of-fit measures for the identified market and institutional factors.

Variable	Coefficient	Standard error	z-value	P-value
Standard/grading	-0.118	0.315	-0.38	0.707
Land access	0.822	0.295	2.79	0.005
Transport facilities	3.401	0.407	8.36	0.000
Title deeds	4.840	0.304	15.93	0.000
Market distance	0.175	0.087	2.01	0.045
Transport problems	-1.182	0.323	-3.66	0.000
Extension visit	3.102	0.509	6.09	0.000

Number of obs: n = 100; Wald χ^2 (7) = 514.42; Log likelihood = -1,119.7855; Prob > χ^2 = 0.0000.

According to the results, the probit model was highly significant and suggested very good fit, with a Wald X^2 of 514.42 and log likelihood of -1,119.79 ($P=0.000$). This would mean that the modeled variables, with the exception of standards/grading, had strong enough influence to determine whether or not the farmers would be satisfied with the way the outcomes of their farming enterprises. The marginal effects are displayed in Table 8.4 and suggest that there was probably a 9% higher probability of a farmer being satisfied with horticulture production if s/he had land access than if access was non-existent. In general, it would seem that possession of title deeds, access to transport facilities, and extension visits had the highest probability of impacting the attitude of the farmer that when these factors were non-existent.

Table 8.4. Marginal effects of the institutional factors implicated in horticulture production in Lesotho.

Variable	Discrete change (dy/dx)	Standard error	z-value	P-value
Standard/grading	-0.012	0.032	-0.38	0.704
Land access	0.091	0.043	2.10	0.036
Transport facility	0.836	0.086	9.74	0.000
Title deeds	0.905	0.040	22.40	0.000
Market distance	0.018	0.012	1.71	0.088
Transport problems	-0.131	0.050	-2.63	0.009
Extension visits	0.854	0.097	8.84	0.000

Marginal effects after probit: $y = \text{Pr}(\text{production satisfaction})$ (predict) = 0.05027315.

The results with respect to title deeds (as a proxy for property rights), transportation, and extension visits deserve some elaboration. As is well known, traditional tenure systems are the norm in Lesotho where the land is held by the monarch or traditional power élite in trust for the population. At the same time, land is in short supply and most Basotho lack access to land for farming. Of the 30,355 square kilometers of land area, only 9% is suitable for arable agriculture (Kingdom of Lesotho, 2006). As it is, as many as 55% of the population do not have access to land for productive purposes (Kingdom of Lesotho, 2006). In the face of customs that frown at alienation of land outside the community, the scope for acquiring land to start or expand agricultural production is quite limited ((Qhobela, 2001). For this reason, land holdings are generally low, with the average farm sizes at about 2 hectares. According to Pule and Thabane (2004), while it is difficult to find clear evidence of tenure insecurity, the need for reform in the land ownership arrangements cannot be over-emphasized. The results of this analysis does suggest that this tenure arrangement is probably one of the most serious constraints faced by farmers and about which they expressed the most concern, with the indication that there was as much as 90% chance of dissatisfaction with the production results if the land tenure arrangement does not change for a more liberal system that allows for farmers to increase their landholding and expand production of horticulture.

The situation with respect to transportation is again understandable in view of the poor state of the rural infrastructure in the country. The state of the infrastructure is not unrelated to the nature of the terrain and topography of the country. Lesotho is a

mountainous country with its lowest point being on average more than 1000 metres above sea level. While the only modern city, namely Maseru, is situated in what is known as the low-lands, the rural areas and farming areas are in the foothills and mountains where access difficulties are often extreme. Despite a small land area of about 30,000 square kilometers, travel within the country can be quite stressful and dangerous due to the high 'elevations and few safe roads' (McNeil, 1996); one of the most charismatic monarchs of the kingdom died in a ghastly road traffic accident in the country on 15 January 1996 (McNeil, 1996) and several high government officials (including at least one government minister) have also met the same fate within the last decade. The few paved roads are narrow and often poorly constructed and pose serious danger to road users. It is therefore understandable that this study would reveal strong influence of transportation on the way farmers felt about the profitability of their farming activities.

The extension service of Lesotho is typical of the extension services in much of sub-Saharan Africa where they face serious constraints of staffing and facilities as well as philosophical orientation. There are frequent criticisms of the agricultural extension service in Lesotho and for its failure to drive the necessary change in the farming populace, especially the rural and resource poor (Mokone and Steyn, 2005). Expert opinion attributes the problem to lack of the requisite skills for dealing with small farmer problems and the absence of the infrastructure for managing the extension service, especially through training, providing the right type of incentives to motivate staff, among other problems. As a result of these problems, farmers are not receiving the guidance they need to apply new production methods, adopt improved inputs and practices, and identify profitable enterprise opportunities, especially in the horticulture sub-sector.

8.6 Conclusion

The current food shortages and attendant high prices have reminded policy about the unresolved problems in many Southern African countries. The virtual collapse of the agricultural sector in the small mountain kingdom of Lesotho is a cause for serious concern for a country that continues to depend disproportionately on South Africa. As domestic calls for improved service delivery become more and more strident in South Africa, its ability to continue to carry its smaller neighbor is questionable. With the increased devastation caused by the HIV/AIDS pandemic, there is a natural anxiety to gain better understanding about the causes of the problem and identify areas of flexibility on which remedial actions can be anchored.

This study was designed to contribute to building better understanding about the institutional constraints to horticulture production. Data was collected from smallholders and gardeners in 5 of the 10 districts of the country and covered a wide range of demographic, production and marketing variables some of which were subjected to econometric analysis to determine the probability that farmers' perception about the profitability of horticulture production would be influenced by a set of institutional factors. There is evidence that more analysis is required on the existing data as well as new information that need to be obtained to have a more objective basis for making definitive statements about the role of institutions in the current state of the horticulture sub-sector in Lesotho.

However, there is enough information to conclude that property rights, especially in respect to land ownership and distribution, is a crucial factor in the way farmers see the potential of the horticulture production in the country. It is equally clear that farmers consider that the extension service and the condition of their infrastructure in general, and in particular the physical infrastructure, deserve some attention. These findings are consistent with views that are widely held both in the country and among the international development community. Policy to address them should therefore be part of a comprehensive national development effort linked to the on-going national vision process. In the case of the land ownership question, it is necessary to recognize the important customary dimensions and proceed with caution in order to bring about change that is at once sustainable and also popular.

The promotion of homestead gardens has been proposed at various levels. The contention is that this would contribute immensely to combating the widespread poverty, growing unemployment, HIV/AIDS, and weak and declining agricultural performance in the country. Policy support for this will be crucial because homestead food production does offer the possibility for marginal households with limited access to land to grow some food for home consumption and also for sale. It is also possible to undertake year-round production of the basic staples of vegetables on such gardens if support is provided to these households for water supplementation such as through water harvesting.

References

- Alemu, Z.G., K. Oosthuizen and H.D. Van Schalkwyk (2003) 'Is Increased Instability in Cereal Production in Ethiopia Caused by Policy Changes?' *Paper Presented at the 25th Triennial Conference of the International Association of Agricultural Economics held in Durban, South Africa, 16-22 August, 2003.*
- Baffour, A. (2003), 'Lesotho- Africa's Best Kept Secret: Pure Majesty'. http://findarticles.com/p/articles/mi_qa5391/is_200305/ai_n21330240.24/06/2008
- Bembridge, T.J. 1984. A Systems Approach Study of Agricultural Development Problems in Transkei. PhD Thesis. University of Stellenbosch.
- Central Intelligence Agency (2008), 'Facts About Lesotho', *The CIA World Factbook*, Washington DC, US Department of State (CIA).
- D'Haese, N. Vink, G. Van Huylenbroeck, F. Bostyn and J. Kirsten (2003), *Local Institutional Innovation and Pro-poor Agricultural Growth: The Case of Small-Woolgrowers Associations in South Africa*, Antwerp/Apeldoorn, Garant.
- EFP (1995), *Commercial Study: 'The Production of High Value Horticultural Crops'*, Consultancy Contract No.:94/109 by Exotic Farm Produce Limited.
- EIU (2002) *Country Profile – Lesotho*, London, The Economist Intelligence Unit.
- Enki, M., K. Belayand, L. Dadi (2001), Determinants of Adoption of Physical Soil Conservation Measures in Central Highlands of Ethiopia: The Case of Three Districts of Shewa. *Agrekon*, Vol 40(3): 293-315.
- FAO/WFP. 2003. *Special Report FAO/WFP Crop and Food Supply Assessment Mission to Lesotho*. Rome: Food and Agriculture Organisation of the United Nations.
- FAO/WFP. 2004. *Special Report FAO/WFP Crop and Food Supply Assessment Mission to Lesotho*. Rome: Food and Agriculture Organisation of the United Nations.
- Feleke, S.T. R.L. Kilmer, and C.H. Gladwin 2003 'Determinants of Food Security in Southern Ethiopia' *Selected Paper Presented at the 2003 American Agricultural Economics Association Meetings in Montréal, Canada.*
- Ferguson, J (1994) *The Anti-Politics Machine – 'Development', Depoliticization, and Bureaucratic Power in Lesotho*, Minneapolis, University of Minnesota Press.
- Gill, S. (1993). *A Short History of Lesotho From the Late Stone Age Until the 1993 Elections*. Maseru: Morija Museums and Archives.
- GOL (1996) *Agriculture: A Strategic Programme of Action – Lesotho Sectoral Roundtable*

- Consultations*, Maseru, Ministry of Agriculture, Cooperatives and Marketing.
- GOL/LCN/WB/USAID/EU (1996) *Pathway Out of Poverty – An Action Plan for Lesotho*, Maseru – Lesotho.
- GOL (2005), *The National Vision 2020*, Maseru, The Government of Lesotho.
- Greene, W.H. (2000), *Econometric Analysis*, New Jersey, Prentice Hall
- Gujarati, D. (1992). *Essentials of Econometrics*. MacGraw–Hill, New York.
- Kherallah, M. and, J. Kirsten (2001), The New Institutional Economics: Applications for agricultural policy research in developing countries. Markets and Structural Studies Division, Discussion paper No. 41, International Food Policy Research Institute, Washington DC.
- Kingdom of Lesotho (2006), 'Kingdom of Lesotho Report', *International Conference on Agrarian Reform and Rural Development (ICARRD)*, Brazil, 7-10 March 2006
- Lesotho Bureau of Statistics. 2006. *Population and Housing Census*. Maseru, Ministry of Finance and Development Planning.
- McNeil, D.G. (1996), 'King of Tiny Land Circled by South Africa Dies in Car Plunge', *New York Times*, New York (16 January 1996 issue).
- Mokone, G., G.J. Steyn (2005) 'Evaluation of performance of extension workers in Lesotho' *South African Journal of Agricultural Extension*, Vol 34 (2005
- Moyo, S., P. O'Keefe, and M.Sill1993. *The Southern African Environment*, London, Earthscan Publications Limited.
- Mphahama, L. 2010. Institutional Constraints to Horticultural Production in Lesotho. Draft Dissertation submitted to Department of Agricultural Economics and Extension, University of Fort Hare (Mimeo).
- Nabli, M., and J.B. Nugent. 1989. Collective Action, Institutions and Development. In M. Nabli and J. B. Nugent (eds.), *The New Institutional Economics and Development*. Amsterdam: Elsevier Science Publishers.
- Pule, N.W. and M. Thabane (2004), 'Lesotho's Land Tenure Regimes': Experiences of Rural Communities and the Calls for Land Reform', *Journal of Modern African Studies*, Vol. 42, No. 2, pp. 283 – 303.
- Qhobela, S.C.(2001), Land Reform and Poverty Alleviation: Lesotho's Experiences during the Last two Decades. Human Sciences Research Council. Pretoria; Republic of South Africa.
- Sen, A.(1981) *Poverty and Famine: An Essay on Entitlement and Deprivation*, Oxford, Claredon Press.
- UNDP (2003) *Human Development Report 2003 – Millenium Development Goals: A compact among nations to end human poverty*, New York, United Nations Development Programme.
- UNDP. (2009). *Human Development Report 2009*. New York: United Nations Development Programme.
- Van Schalkwyk, H.D. and A. Jooste (2002) 'The External Agricultural Trade Environment of Lesotho with Specific Reference to Trade Agreements', *Compiled as part of a larger Study investigating reforms to Lesotho's Agricultural Marketing Act.*, Maseru, Ministry of Trade, Industry and Cooperatives.
- Van Schalkwyk, H.D. and M.L. Mhalanga (2002), *The Enhancement of Rural Marketing in Lesotho*, Agricultural Policy and Capacity-Building Project, Ministry of Agriculture, Cooperatives and Land Reclamation, in collaboration with the Department of Marketing, Ministry of Industry, Trade and Marketing.
- World Bank. 1986. Poverty and Hunger: Issues and Options for Food Security in Developing Countries. World Bank Policy Study. Washington DC, The World Bank.
- Yúnez-Naude, A. and E. Taylor (2001). The Determinants of Nonfarm Activities and Incomes of Rural Households in Mexico, with Emphasis on Education'. *World Development* Vol. 29(3).